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Energy Performance Contracting in the EU – 2020-2021

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Abstract

Energy Performance Contracting (EnPC) constitutes an opportunity to bridge the investment gaps faced by the EU to meet its targets of energy efficiency, energy performance of buildings and decarbonisation. In addition to mobilizing private sector financing and technical capacities, EnPCs provide energy saving guarantees and can potentially take away financing risks from clients and providers. The European Commission's Joint Research Centre (JRC) has been regularly reviewing the status and development of the energy service markets of the EU since 2005. The present report uses the same methodology to study the EnPC markets of the EU during 2020-21. Ultimately, the report provides a set of recommendations of relevance for policy-making both at MS and EU levels. The report findings indicate a continued potential for the public and private sectors to engage with EnPCs. Interventions in public buildings and public lighting, followed by private buildings are the most frequent types of projects. There is a trend towards incorporating renewables – constrained by Eurostat rules on the treatment of EnPC investments – district heating, system automation and interventions in the industry. In general, MS policymaking would benefit from fully implement EU directives – especially EED Arts. 18, 5 and 6 – to overcome market barriers. There is a need of market intelligence, technical assistance and sectoral qualification, whilst diverting public funds towards long return projects (e.g. on building envelopes) and leveraging private financing. The EU strategic and regulatory developments alongside technical assistance have been key market drivers. The EU institutions would benefit the market by continuing to guide MS-level efforts and providing platforms for compiling and exchanging knowledge.

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Executive summary

This report reviews the status and future development of the EU Energy Performance Contracting (EnPC) markets. Fundamentally, EnPC constitutes an opportunity to bridge the investment gaps faced by the EU to meet its energy efficiency targets, energy performance of buildings and decarbonisation. This is important in the context of revised commitments of the EU to climate neutrality, energy independence and advancing the green economy, which are laid out in the European Green Deal, the Climate Target Plan 2030, the Next Generation EU, the Renovation Wave communication, and the RePowerEU.

Energy services, overall, create an incentive for the client to engage in energy efficiency projects, allowing them to recover investment, transaction, and service costs. Depending on the contract, the client can free economic resources since investments can be provided by or through the provider. EnPC is an energy service contract whereby the providers' remuneration is linked to the successful delivery of the contracted savings. Two major modalities of EnPC exist, i.e. a) guaranteed savings, whereby the client takes the financing risk (financing is therefore on the clients' balance sheet), and b) shared savings, whereby the provider brings about the financing means. In the latter case, the project can result in an off-balance sheet arrangement for the client. EnPC has been promoted via public policies in the EU and its MSs as a part of a toolset to foster projects involving investment in energy efficiency, renewables, and other technological improvements resulting in energy and cost-savings during the service lifetime of technologies, buildings, systems, and infrastructures.

The European Commission's Joint Research Centre (JRC) has been regularly reviewing the status and development of the energy service markets of the European Union (EU) Member States (MS) since 2005. Previous JRC reports reviewed the public sector EnPC markets (2017 and 2021) and the ESCO markets in the EU (2005, 2007, 2010, 2014, 2017, 2019). The present report builds on the previous knowledge developed in previous JRC reports. It uses the same methodology (based on a consultation with national experts and a documental review) to investigate the status, trends, barriers, and driving factors of EnPC markets. It provides recommendations for further EU support and policymaking.

Since 2018, the revision of energy efficiency and climate targets – underlying the adoption of EnPCs – has been speeding up. The Energy Efficiency Directive established a 32.5% efficiency improvement target for 2030 compared to baseline energy consumption. The European Green Deal, the Climate Target Plan 2030 and the Fit for 55 have revised energy efficiency and decarbonisation targets and fostered the revision of the EPBD and the EED. Recognising that buildings are key to achieving these EU goals, the Renovation Wave initiative and the ongoing revision of the EPBD aim at exploring the potential of renovating the European building stock and include provisions for building sector decarbonisation and deep renovation. The Next Generation EU and RePowerEU plans have added EU funding for attaining energy and energy performance targets and developing the green economy.

The major report findings are summarised below:

- 1) *Status of the public and private sectors as clients of EnPC.* The EnPC model continues to offer energy efficiency and performance improvement solutions, thus benefiting end-users, Members States' economies and providers alike. However, there is a general lack of national data and databases on key indicators, including the number of market players capable of conducting EnPC provision and facilitation and financing, ESCOs and EnPC providers, and the concluded contracts. There is continued potential for the public sector to lead market development.¹ The private sector's activity as an EnPC client is sizeable, and in some MSs, the private sector leads the market.
- 2) *Trends (2017-21 and 2020-21).* There has been general growth in the EnPC market. Exceptions are Slovenia, Slovakia, Finland, Sweden, Latvia and Lithuania. Policy developments in smaller markets (Cyprus) also indicate a consolidation of the EnPC model. Moreover, A) *The private sector EnPC markets of the EU generally grew.* Activity increased in 9 MSs, i.e. Belgium, Cyprus, Finland, France, Hungary, Ireland, Poland, Romania, Slovakia, and Slovenia. The markets remained stable in 6 MSs, i.e. Austria, Denmark, Germany, Italy, Netherlands, and Spain. On the other hand, EnPCs failed to take off in 6 MSs, namely in

¹ The public market could be twice to four times the size of the private market in terms of annual investment (€1.9-4b in contracts, and €1-1.1b, respectively, signed in the public and private sectors in 2020-21).

Portugal, the Czech Republic, Greece, Lithuania, Sweden and Bulgaria; and markets contracted in Croatia and Latvia. B) *The public sector EnPC markets* have grown globally since 2020. They expanded in particular in 8 MSs, i.e. Belgium, Czech Republic and Slovenia, Austria, France, Greece, Germany and maybe Hungary. The market was stable and low (or did not take off) in 10 MSs, i.e. Bulgaria, Denmark, Finland, Greece, Ireland, Lithuania, Poland, Cyprus, Malta and Romania. The market contracted in 7 MSs markets assessed as developed or having a good perspective for development in previous JRC reviews, i.e. Croatia, Czech Republic, Italy, Latvia, Portugal, Slovenia, and Sweden.

- 3) *Perspective for 2022-2024.* Further growth is expected between 2022 and 2024, especially for private markets. There is a risk of the public sector losing momentum after leading the market's development. This is an issue because trends in the public and private sectors of MSs are generally aligned. There are minor differences between both sectors' perspectives in the Czech Republic, Lithuania, and Slovenia. The clearest positive trends were forecast for 8 MSs, i.e. Belgium, Czech Republic (especially in the public sector), France, Germany, Ireland, Poland, Slovenian (especially in the private sector), and Spain. Expectations for take-off were reported for 3 MSs, i.e. Romania, Sweden and Cyprus. Market contraction was only projected for Croatia (both public and private sectors). Market uncertainty was reported in several MSs as related to policy and strategic development, including the implementation of the Recovery and Resilience Plans (RRPs).
- 4) *Business environment.* The sufficient availability and quality of providers, facilitators and financing actors appear highly related to market developments in MS. Discrepancies between the availability and quality of the services provided by these actors often reflect limited capacity and willingness to operate within the EnPC framework. There are limitations of training and certification, official lists of providers, training and certification of facilitators, knowledge of financing actors and exploiting the potential of one-stop-shops.
- 5) *Contract modalities.* Contracts with guaranteed savings are, although marginally, the most common in the public sector. These are most widespread in Austria, Belgium, Croatia, Denmark, Slovenia, Slovakia, Finland, Greece, and Poland. In the Czech Republic, a widespread model combines guaranteed and premium shared savings. Shared and guaranteed savings are of similar relevance in the private market of EnPC at the EU level. Two major contracting modalities compete with EnPC, i.e. simpler energy service contracting models with lesser guarantees and b) conventional contracts of works, often with the support of EU grants (Croatia, Cyprus, Bulgaria, Poland, Romania, Czech Republic, France, Germany and Spain).
- 6) *Project sizes.* The largest project sizes were reported in France, Denmark, Belgium, Greece, Slovenia, and the Portuguese private sector (contracts above €3m), driven by requirements of scale in ELENA and providers. In public lighting, smaller contracts around €1m continue to be common (e.g. Croatia). There are several MSs where contracts in the private sector are gaining the same or larger scale than the ones in the public sector (Belgium, Finland, Denmark, Ireland, and Portugal). Project duration varies across markets depending on the depth of intervention, availability of financing and subventions for long-payback interventions, and energy prices. Long paybacks above 12 years are common in the public sectors of Denmark, Poland, Slovenia, Czech Republic, German, Netherlands, Latvia, and Lithuania.
- 7) *Types of projects.* The savings achieved largely depend upon the type of interventions. The largest savings are reported in public lighting– 85% in Croatia and 70% in Spain and Portugal. Most interventions in buildings achieve 25-30% of savings over the baseline. Larger savings are attained in deep renovations (40-50% savings) – common in Lithuania and Latvia – but these market options are less successful and require specific support from public funding. Public buildings, followed by public lighting, are the most frequent type of project in the EU. The third most common area of intervention is private buildings, followed by interventions in the industry and bundling of different types of interventions (e.g. public buildings and lighting), district heating, and smart grids. The most common types of interventions in buildings continue to be the replacement of specific technical elements. On-site renewable generation is gaining momentum, especially in private buildings. Deep renovations are relevant only in a few MSs because these interventions require integrating client or public support funds to address the interventions with long paybacks (envelope); maintenance tends to be also an element of EnPCs. There is a trend towards incorporating new technologies (renewables, demand flexibility and storage, building management systems).
- 8) *Barriers and drivers.* Comparison between the 2019-21 and the 2022-24 periods shows a marginal reduction in the presence of several barriers besides grant competition and an important increase in the number of drivers. A) The most important barriers reported for different MSs are limited knowledge and expertise of clients and financing actors; model complexity and trust issues; debt treatment, lack of

affordable financing for providers, and the integration of decarbonisation. Regarding policy-making, there is a slow policy implementation and update (e.g. regarding Art. 18 of the EED), including the competition of grants and subsidies and issues of compatibility with EnPC, development of contracts and guidelines, technical support and information instruments, procurement and tendering rules, and use of EnPC by public bodies, as well as issues of policy commitment, legal and procurement barriers and burden, and policy uncertainty often related to the implementation of the RRP. Some structural barriers are important in some MSs. These barriers involve subsidised energy prices, slow recovery of activity after the Covid pandemic, market size (including considerations to administrative and regulatory division in federal MSs), and early implementation of projects addressing low-lying fruits are also key in some MSs. B) EnPC is driven in MS markets by the EU strategic and regulatory developments and sectoral capacities (mainly driven by technical assistance and providers). The European Green Deal, the recast of the EED, the EPBD, the Sustainable Finance Disclosure Regulation (SFDR), and the EU taxonomy for sustainable activities create adequate conditions and are expected to have a further positive impact. EU energy saving and decarbonisation targets and increasing energy prices since 2021 are key drivers for EnPC. They are also drivers for simpler contracts operating as an alternative to EnPC.

- 9) *Balance treatment of EnPC in clients' accounts.* In 2019-20 the development of off-balance contracts has brought attention towards EnPC in several MSs. However, the Covid pandemic largely contributed to slowing down or halting the development of off-balance model contracts. Nowadays, there is a reported existence of off-balance contracts in 17 MSs. However, several existing model contracts need to be adapted, the number of off-balance contracts signed in the EU is relatively low, and only a few projects have been reported and officially approved by Eurostat. Demands for contract adaptation and update largely refer to the need for simpler, flexible models to address decarbonisation needs. However, this is not easy within the compliance framework with off-balance contracting set by Eurostat, which limits the use of renewables in off-balance EnPC contracts. There is also a pressing need for revising the treatment of EnPC at the sub-national level in several MSs. The private sector is increasingly interested in off-balance EnPC models (meeting IRFS standards).

The national-level recommendations of the report involve the following:

- 1) *Public sector markets.* Continue or initiate public sector activity to lead the market, especially when alternative contracting modalities without verified and guaranteed savings could be gaining momentum. There is a need to mainstream the Energy Efficiency First principle and to take action to meet energy efficiency and climate targets. In application of Art. 18 of the EED, there is a need for policy harmonisation and clarification in the regulatory, financing and administrative domains for these not to act as barriers to EnPC in public sector markets, including addressing financing compatibilities between grants and EnPC, eligibility of energy service providers for grants, the use of third-party financing in the public sector, and restrictions on using EnPC in the public sector or its buildings. In addition, public sector regulators should consider the advantages of introducing requirements for assessing project EnPC-ability and developing long-term strategic programming.
- 2) *Financing.* MSs need to refrain from using high grant rates that deter the participation of private investment, hence reducing the leverage of public funds. The use of public funding can be better allocated by incentivising EnPC, e.g. audit support, support to eligibility studies, conditional eligibility for grants, subsidies and tax reliefs; supporting with grants only investments complementary to EnPC, i.e. with long return periods or addressed to vulnerable households; and developing guarantee and energy efficiency funds to support access of providers to financing and refinancing.
- 3) *Development of model contracts for the public sector.* For these to be adapted to the national context, and hence simpler, adapted to sectoral potentials, and exploiting the need to integrate decarbonisation, life cycle benefits. There is also a need to clarify the role of maintenance, renewables and interventions in the envelope in collaboration with national stakeholders and financing authorities. The latter is needed to integrate EnPC into national strategic roadmaps.
- 4) *Monitoring and supporting the business environment.* Developing and updating EnPC guidelines, contract enforcement, quality control, and monitoring and verification (M&V) standards, e.g., following the International Performance Measurement and Verification Protocol (IPMVP), continue to have potential in several MSs. As in the case of contract development, this requires considering the needs and expertise of various stakeholders. There is a potential for most MSs to monitor the market and support its capacity development whilst increasing transparency and trust in the EnPC model. Most MSs would benefit from creating a national registry of EnPC projects, listing specialised service providers and facilitators, introducing certification mechanisms for service providers and providing training for facilitators, and

engaging the financing sector—a potential lies in developing national and regional offices and one-stop-shops.

- 5) *Governments' promotion and exemplarity.* There is a continued need for tailored information to address both clients and financing actors for these to understand better the benefits and risks of EnPC, understood as a beyond-financing mechanism. MS governments and public sectors must send clear signals to the financing sector about their commitment to EnPC and its role in meeting energy efficiency and decarbonisation targets. Central governments and, potentially, regional and local authorities can contribute to normalising EnPC by using this mechanism as a part of the implementation of Art. 5 of the EED on the exemplary role of public bodies' buildings and the likely introduction in the EED recast of provisions for the public sector to lead on energy efficiency.
- 6) *Strategic and regulatory development.* Strategic alignment with the targets and requirements set by the EC in current and upcoming policy developments and financing support would benefit from prioritising EnPC as a mechanism that provides performance guarantees, enables a multiplier effect of public funds, and addresses the Energy Efficiency First principle. Efforts in improving regulatory consistency, clarity and – in the case of MSs with a high degree of decentralisation – harmonisation are widely necessary to reduce policy uncertainty, project preparation, and administration cost.
- 7) *Technical assistance.* Acknowledging the success of EU-level technical assistance, there is an unexplored potential for developing national and regional technical assistance capacities, e.g. through one-stop shops and technical assistance facilities. These capacities support project drafting, contract development, project bundling and aggregation, and training for public and private clients and financing bodies.

The EU institutions, especially through the various programs of the EC and the EIB, continue to play a key role in setting the scene and supporting MSs to develop and upgrade their markets for these to exploit the potential in EnPC. Whilst EnPC markets are tied to the MS level. Hence, MSs must commit to establishing an adequate national context; there is a series of domains where EU-level support continues to have potential, especially in guiding MS-level efforts:

- 1) *Continue collaborating with MSs in communicating the scope of EnPCs,* as focused on energy efficiency investments with short-to mid-term return periods and their integration with renewables. The Eurostat and EIB guidance on the public debt treatment of EnPC created expectations for boosting EnPC market development. The current interest in renewables has resulted in a lower interest of clients for efficiency and frustration related to the complexity and limitations introduced concerning including renewable generation in EnPC projects. The EU-level guidance could serve as a model for some central governments to reconsider their budgetary constraints on regional and local authorities.
- 2) *Continue and strengthen strategic support from the InvestEU Advisory Hub* to MSs on developing contracts whilst assessing the suitability of EnPC and other models to tackle the potential for deep renovations of buildings and pursue energy-saving and decarbonisation targets. These efforts should explore and bring together the multiple experiences developed with the support of Horizon 2020/ Horizon Europe programs which have worked on developing a wide array of contracting and financing models within and beyond the boundaries of EnPC and off-balance contracting.
- 3) *Provide technical support for market monitoring, establishing lists of EnPC providers, training and certifying providers and facilitators and adopting M&V standards,* such as IPMVP. Moreover, market monitoring at the MS level would gain leverage with increased efforts on communicating the EnPC experiences and potential through EEEFIG, DEEP, CAEED, CAEPBD, and SEI Forum. This could set the grounds for creating a centre of excellence on EnPC for disseminating good practices, exchanging experiences, and creating a repository of projects.
- 4) *Guide the national allocation of Structural and Investment Funds (2014-20), Cohesion Policy Funds (2021-27) and the Recovery and Resilience Facility funds* to avoid competing or being incompatible with EnPC and complementing the investments made through the latter model. This is important to achieve a multiplier effect of EU funds, contributing to achieving pressing targets of energy saving and building decarbonisation. Moreover, it would be advisable to introduce and strengthen EC guidelines on using EU grants, allocation criteria on the achievement and demonstration of savings (like those in ELENA), and dissemination of financing instruments as alternatives to the direct allocation of subsidies with high grant rates. There remains a potential for the EU institutions to support MSs in setting guarantee mechanisms and refinancing capacities that could help MSs allocate funds to attain a multiplier effect of public funding whilst increasing the capacity of EnPC providers and reducing risk perception.

- 5) *Continue the EC and the EIB's efforts of disseminating the EnPC model* whilst emphasising the benefits of EnPC beyond financing. Otherwise, persistent understanding of EnPC as a financing mechanism results in frustration when clients with insufficient technical means face a more complex than expected instrument.
- 6) *Provide more information and clarification of the available EU support*, both technical and financial, to clients, providers and financing actors. Collaboration in this domain would help MSs to fully implement the requirements of the EED Article 18, with a focus on EnPC and expected developments in this domain as put forth in the upcoming recast of the EED.
- 7) *Relying on the success and demand for Technical assistance and Project development assistance*, and without prejudice to point 7 in national-level recommendations, there is a potential for the EC to continue and strengthen these and introduce simpler and more flexible application mechanisms in the areas of project aggregation, setting technical assistance facilities at the MS level that replicate the success of ELENA at the national level.

1 Introduction

Energy Performance Contracting (EnPC) is a mechanism that has been promoted via public policies in the European Union (EU) and its Member States (MS) as a part of a toolset to increase the implementation of energy efficiency projects. The EC has committed policy efforts to EnPC since the Energy Efficiency Directive (EED) in 2012 to foster active markets in most MSs. Energy performance projects involve investment in energy efficiency, renewables, and other technological improvements, resulting in energy and cost-savings during the service lifetime of technologies, buildings, systems, and infrastructures. EnPC can mobilize the technical and financial capacities of third parties, typically specialized ESCO providers (commonly referred to as “ESCOs”), to cost-efficiently attain energy or economic savings through performance improvements at the premises of the client (see **Box 1** for clarification). Contracting Energy Services creates a financial and technical incentive for the client to engage in the contract, allowing parties to recover their investment, transaction, and service costs. Moreover, the EnPC contractor, referred to as the provider in this report, guarantees a certain level of energy savings (or related economic savings) during the contract period and links its own remuneration to the delivery success rate. The EED (2012) defines EnPC as:²

“Energy performance contracting means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.”

Box 1. Clarification on the use of “energy efficiency” and “energy performance” in this report.

To align with the conceptual focus of the Energy Performance of Buildings Directive 2010/31/EU (EPBD), in this report, we use the term “energy performance”. In a strict sense, “energy efficiency” refers to those solutions, technologies, systems, materials, and designs that require less energy input than those they replace to generate similar or improved services. Improving energy performance involves saving energy and/or improving the service through energy efficiency improvements. It allows for integrating renewable generation solutions to lead to financial savings or other benefits in addition to those generated by energy efficiency improvement, e.g., additional revenue streams from RES-related support schemes and decarbonisation of energy consumption. The Eurostat guidelines and further clarification drafted in collaboration with the EIB (2017, 2018) clarified that it is possible to incorporate renewable generation as contributing to contractual performance improvement.

Despite the decades-long efforts to tap into the energy efficiency potentials, the “energy efficiency gap” (Jaffe and Stavins 1994) and, more recently, the “energy performance gap” (Sovacool et al. 2015; Galvin 2014) are well-recognized in all demand sectors. Energy Services and, especially, EnPC contract models addressed to overcome the investment gap are complex, and clients have actual or perceived reservations. Even more, the guarantees structures and complex financial solutions require the client and contractor to develop trust beyond the written contracts. Despite efforts by the European Commission, Member States, and ESCO associations to develop universal and easy-to-understand energy services terms, the EnPC market is hampered by definitional confusion (Panev et al. 2014; Boza-Kiss et al. 2017; Boza-Kiss et al. 2019). Standardizing qualified services and contracts and developing monitoring and verification (M&V) systems are considered to help reduce transaction costs and make the services provided transparent. Yet, there is an evident need for tailoring due to the variety of clients and project types and the required services.

EnPCs fall into two major modalities: contracts with guaranteed and shared savings (**Box 2**). These differ in the distribution of risks between the client and the provider. In both cases, the remuneration of the EnPC provider depends on fulfilling an agreed energy performance improvement, shielding the client from performance risks.

² A proposal for the recast of the EED currently includes a change in the definition to refer to “where work, supply or service” instead of “where investments (work, supply or service).”

Box 2. Comparison of Guaranteed and Shared saving models of EnPC.

Guaranteed Savings	Shared savings
The provider guarantees a certain level of energy savings and, in this way, shields the client from any performance risk	The cost savings are split for a pre-determined time and under a pre-arranged percentage. These depend on the cost of the project, the length of the contract and the share of risks
<ol style="list-style-type: none"> 1. Performance related to the level of energy saved 2. Value of energy saved guaranteed to meet debt service obligations down to a floor price 3. The provider carries performance risk/ the client carries credit risk 4. If the client borrows, it is on-balance sheet 5. Requires creditworthy clients 6. Extensive M&V 7. Providers do not get highly leveraged 8. Used for more comprehensive projects 	<ol style="list-style-type: none"> 1. Performance related to the cost of energy saved 2. The value of payments to the provider is linked to energy price (added risk) 3. The provider carries performance and credit risk 4. Usually, it is off-balance sheet 5. Can serve clients with no access to financing 6. Equipment may be leased 7. Favours large providers 8. Favours projects with short payback

Source: JRC based on European Energy Efficiency Platform (E3P) (2020).³

The European Commission’s Joint Research Centre (JRC) has published reports mapping the energy service markets across the European Union (EU) and its Member States (MSs) since 2003. Key publications in this series date from 2005, 2007, 2010, 2014, 2017, 2019, and 2021. The JRC reports of 2017 and 2021 (Boza-Kiss et al. 2017; Moles-Grueso et al. 2021) constitute the most comprehensive and updated review of the status of EnPC in the public markets of the EU in the periods of 2016-17 and 2018-19, respectively. Methodologically, these reports rely on expert input gathered through surveys, interviews and feedback, and reviewing the policy and scholarly literature. The present report uses the same methodology to assess the policy and market developments in 2020-21 in the EU and its MSs. Reproducing the structure of previous JRC reports, we review the barriers, driving factors, best practices identified at the MS level, and the impact of EU supporting mechanisms. Ultimately, the report provides recommendations relevant to MS and EU-level policymakers.

A series of policy development in recent years has been adopted in light of the EU’s commitment towards full decarbonization of the economy in a few decades. The role of the public sector has been repeatedly emphasized: in terms of its contribution to the expected energy savings, its exemplary role (especially through central government but also other public buildings), its potential to create and form the energy efficiency market, and its sizable public procurement. The EU and MSs recognize the need to leverage private investment to achieve the necessary energy system transformation and untap energy performance’s potential. The JRC report of 2021 (Moles-Grueso, et al. 2021) assessed the impacts of a broad range of policy and decision changes: the 2018 amendments on the Energy Efficiency (EED) and the Energy Performance of Buildings (EPBD) Directives, the Eurostat Guidance Note of 2017 and the Eurostat and EIB Guide of 2018;⁴

³ Cites Dreessen 2003, Hansen 2003 and 2004, Poole and Stoner 2003.

⁴ These clarified the conditions for the off-balance treatment of EnPC investment in the public sector in government accounts and as reviewed in previous JRC communications have boosted the development of standard contracts.

the Smart Financing for Smart Buildings initiative (SFSB) framing ELENA, Project Development Assistance (PDA), Horizon 2020, the De-risking Energy Efficiency Platform (DEEP), and the EEFIG Underwriting Toolkit; the adoption of the European Green Deal and its Renovation Wave communication. The JRC 2021 report also looked at the impacts of the ongoing COVID-19 pandemic on the public sector EnPC markets of the EU.

The evolution of energy efficiency and climate targets - underlying the adoption of EnPCs - has been speeding up since 2018, when the amendment of the Energy Efficiency Directive established a 32.5% efficiency improvement target for 2030 compared to baseline energy consumption. The European Green Deal and the Climate Target Plan 2030 have strengthened the Commission's commitment to attaining carbon neutrality in the EU by 2050, largely relying on the EU's energy efficiency and renewable energy policy. The Fit for 55 policy package aiming to deliver a greenhouse gas emissions net reduction of 55% below 1990 levels involves revising the EPBD and the EED. The buildings sector is key to achieving these goals. The current proposal for a recast of the EPBD⁵ includes provisions for building sector decarbonisation, deep renovation, new Minimum Energy Performance Standards (MEPS) and a Zero Emission Building standard. More ambitious and detailed building renovation plans should replace current LTRS, and fossil fuels need to be phased out in buildings by 2040. The Renovation Wave communication aims at exploring the efficiency and economic potential of renovating the European building stock, the Next Generation EU for green recovery after the Covid pandemic, and the RePowerEU plan – responding to energy shortages caused by the Russian war on Ukraine – have, altogether, furthered climate and energy commitments of the EU.

The report is built up as follows. After Section 2 presents the methodology used in this report, Section 3 reviews the implications of the policy developments described above. Sections 4-11 summarize the findings about the MSs' EnPC markets based on the EU Survey 2022 and additional information collected in the MS summaries (Annex 1) on the Market size, Status of the business environment (actors and contracts), Project characteristics, Barriers and drivers, Regulatory framework, Balance sheet treatment of EnPC investments, EU support, and Recommendations at MS and EU level. The final 2 Sections provide a set of Conclusions about the EnPC market of the EU; and Recommendations for the European Commission.

⁵ COM (2021) 802 final.

2 Methodology

This report reviews the EnPC markets of MSs in 2020-2021 based on qualitative, semi-quantitative, and quantitative data collected during 2022 from experts and documents. A total of 49 MS- and EU-level experts provided direct input to the EU Survey 2022, either through the survey itself or through interviews. Moreover, national experts provided 69 pieces of feedback on the MS summaries.

Expert input often involved several experts filling out the survey or participating in the interview. It received about the EU market and MSs or national sub-markets of regions and cities. Experts did not provide input for Luxembourg and Malta. These expert insights were often the only way to obtain key data, which was then contrasted and complemented with a review of the policy literature and other documents. Expert's inputs are anonymized in the report, and their participation is only acknowledged with their permission. This report refers to their input as contributing to the EU Survey 2022.

Qualitative data served to assess barriers, driving factors, best practices, opportunities, and recommendations. The collected quantitative data included typical contract size, average contract duration, average contracted savings, the overall number of contracts and economic market size, and the number of energy service providers, facilitators, one-stop-shops, and financing actors involved in the market. The semi-quantitative evaluation relied on experts' assessments of market trends, the impact of policy instruments (Eurostat guidelines, EEFIG, DEEP, PDA), the commitment and understanding of different actors, the sufficiency of services their use to fulfil exemplary obligations (Art. 5 of the EED).

The JRC's expertise on the topic and drafting previous reports were key for appraising data validity and its eventual consolidation and interpretation. A selected group of experts provided feedback on national summary reports (Annex 1) during October 2022 and January 2023. A total of 69 pieces of feedback were received.

The methodological limitations involve definitional diversity, experts' subjectivity in analysing their markets, and reticence to make estimates in contexts where official market monitoring is missing and sometimes largely disaggregated, e.g. between regions and states.⁶ Expert participation in the survey and interviews was smaller than in previous reports (e.g. 74 respondents provided input for the JRC 2021). This reduction in participation could be due to respondent fatigue, increased in the post-Covid situation where online input has been increasingly demanded from experts, the increased scope of the study (now including the private sector), which could dissuade experts with expertise only on some sectors, e.g. the public sector. Whilst the survey takes some 20-25 minutes to fill whilst relying on data with which the experts are acquainted, assessing the broad set of indicators required to understand EnPC markets could take much longer for those needing to gather data from different sources. It could also relate to a degree of stagnation in some markets or failure to fulfil expectations for take-off (Malta and Luxembourg). However, the overall expert input obtained through the survey was more complete than on previous occasions in addressing most questions.

This report's data, findings, and recommendations need not be considered official statements from Member States or the European Commission. They are based on experts' opinions, available documents and the authors' analysis and intend to highlight the market perceptions, concerns, and forecasts put forth by practitioners.

⁶ Due to the data collection taking place in 2022, it is possible that recent developments – e.g. increase in prices and financing costs resulting from the Russian war on Ukraine – gain relevance as opposed to others which were key during the reported period (2020-21), e.g. developments related to the adoption of off-balance contract models.

3 The context

The EU needs to speed up the progress towards its energy efficiency targets. A 2021 review of the status of building renovation in the EU points out that the decrease in the final energy consumption of the building sector is slow, with a total of 5% between 2005 and 2018 (Zangheri, Economidou, and Labanca, 2019). Most (85%) of Europe's buildings were built before 2001 (European Commission, 2020). Energy renovation is critical to meeting sustainability goals. In the building sector alone, "an additional EUR 275 billion per year is necessary for 2021-2030 to reach EU energy and climate objectives in 2030" (European Commission, 2022).

According to the EEFIG, "investment in energy efficiency in buildings and industry needs to increase to over two to three times the current level to achieve the EU targets. Many think these multiples are even higher". In the EU industry, investment in energy efficiency has been constant since 2018 at around €5b per year, and investment should be almost three times this amount (€14b) to reach the targets as of 2022 (EEFIG, 2021).⁷

Reflecting on the role of ESCOs, EEFIG is confident that "rapid progress can be achieved in the industry, due to the size of the gap and the availability of finance, and the driver effect of the upcoming introduction of ESG criteria. In addition to being one possible source of financing, ESCOs can be relevant to industry and SMEs to supply for advice" (EEFIG, 2021.) Despite support programs and funds, progress in buildings is inadequate, and there is an unexplored potential to speed up building renovation through energy service contracting (European Commission, 2022).

Another barrier to energy efficiency interventions in buildings is that almost four times more public money goes into renewables than energy efficiency (Economidou, et al., 2019). According to the EC, this preference for renewables results from the capacity of "renewable generation [to] provide predictable, stable cash flows that offer attractive returns to investors in a low-interest rate environment". As a result, the EC continues, "Progress in contract and risk assessment standardisation for energy efficiency projects offers the possibility of energy efficiency portfolios delivering similar risk-adjusted yielding returns in the future" (European Commission, 2022, p.44) and compensate for the slower returns of efficiency renovations. Whilst the previous JRC report on EnPC markets (Moles-Gruesso, et al. 2021) identified an untapped potential in combining revenue streams from on-site renewables and energy efficiency interventions in buildings to strengthen the viability of the EnPC model, there is a need of continued efforts to exploit the potential for standardizing contracts and tailoring them to national needs. Following the EU's efficiency first principle, the latter would equalize risks between energy efficiency and renewable portfolios. Otherwise, there is a risk of efficiency interventions receiving insufficient attention hence locking in a savings potential. Clarifications in the Eurostat and EIB guidelines on the treatment of EnPC in government accounts and clarifying the limits on the use of renewables as a part of off-balance EnPC contracts (Eurostat, 2017; Eurostat and EIB, 2018) and signals about the phasing out of fossil fuel generation in buildings in the current proposal for a recast of the EPBD (European Commission, 2021) are key in this domain.

There is a fundamental need to streamline private financing into energy efficiency projects to improve the overall energy performance of the EU buildings sector through building renovation (Economidou, et al, 2019; JRC, 2021), energy efficiency, and climate targets (JRC, 2021; EC, 2021). Following up on the 2018 Action Plan on Sustainable Finance, the Commission's Strategy for Financing the Transition to a Sustainable Economy (European Commission, 2021) calls for an increased alignment of public, private, international and multilateral capital to attain environmental, social and climate targets. Accelerating energy efficiency action in the building and other sectors calls for a more dynamic role of private financing instruments and the finance sector. The EEFIG (European Commission. Directorate General for Energy. et al., 2022) claims that "Achieving the EU's targets for energy efficiency and emissions reduction ... will require mobilizing significant amounts of private capital through a variety of appropriate financing instruments."

Slow improvement of the energy performance of the Union's buildings involves a potential for EnPC and other intervention mechanisms, yet it also implies limitations in assessing these potentials and standardizing projects. For instance:

⁷ Cites EIB 2019, and Energy Lending Policy 2019.

“The share of energy-certified buildings across Member States is still very low. Only about 10% of the existing buildings have an Energy Performance Certificate...Even though the use of EPCs generally improved after the EPBD recast, it is clear that further changes are needed to make EPCs a reliable information source...The report reveals that currently 25 Member States have in force a complete Nearly Zero Energy Building definition. NZEB requirements are currently 70% lower than the national minimum energy performance requirements in 2006, showing a consistent trend in increasing building energy efficiency.” (JRC, 2021)

EnPC addresses two major areas of relevance for the EU to attain its targets, savings guarantees and engagement of private investment. Guaranteed savings constitute a step towards overcoming uncertainties in a changing economic (e.g. energy prices) and technological context. Policy support to EnPC includes financing and non-financing mechanisms. Financing and economic support are key to boosting efficiency investment and promoting EnPC for its capacity to engage private investment and provide performance guarantees. Non-financing instruments to support EnPC are also needed to foster energy efficiency investment and reduce the transaction costs and risks associated with EnPC. For instance, these instruments foster the aggregation of small projects by establishing one-stop-shops and technical assistance; overcome performance uncertainties through project standardization; and recognize non-energy benefits (Economidou, et al., 2019).

A complex and evolving ecosystem of EU policy and support, different degrees and pathways of implementation by MSs and structural determinants shape the context for the development of EnPC markets, and make necessary a relatively extensive review. The following four sections address the EU policy framework shaping the targets, regulations and funding available; the EU mechanisms of support; the implementation by MSs of the EED and the EPBD and the RRF; and the structural factors of energy and financing costs.

3.1 EU policy framework

The EU is implementing two strategies in the domains of climate, energy efficiency and building performance, i.e. the Clean Energy Package and the European Green Deal. The Clean Energy Package pursues to contribute to a reduction in greenhouse gas emissions of 55% by 2030 and climate neutrality of the EU by 2050, as stated in the Climate Target Plan 2030 (European Commission, 2020). It involves a revision of the EED, the EPBD, and the RED (agreed upon in 2018). The European Green Deal and the Climate Target Plan 2030 strengthened the Commission’s commitment to the EU attaining carbon neutrality by 2050, largely relying on the EU’s energy efficiency and renewable energy policy. The buildings sector is also key to achieving these goals. The Fit for 55 package (2021), meant for “Delivering the Green Deal”(European Commission, 2020), involves a recast of the EED with plans to revise the 2030 targets for energy efficiency, a recast of the EPBD, and the Renovation Wave communication (European Commission, 2020).

3.1.1 Renovation wave

The Renovation Wave communication (14 October 2020) of the European Green Deal recognizes the need to bridge the financing gap in building renovation, estimated at €275b annually, to reduce buildings’ greenhouse gas emissions by 60% to meet the Climate Target Plan 2030 to cut net greenhouse gas emissions in the EU by at least 55% by 2030 and help overcome the Covid-19 crisis (European Commission, 2020).⁸ It also intends to double the annual energy renovation rate of residential and non-residential buildings by 2030. Renewed relevance has been granted to the “Energy efficiency first” (EE1st) principle. This principle is an essential part of the Clean Energy Package. The Fit for 55-package of July 2021 calls for its inclusion as a legal provision in the Energy Efficiency Directive, followed by the EED-recast proposal, including the principle in Article 3. Amongst others, the Renovation Wave plans for the Commission and the EIB to foster the replication of the ELENA model at the national level through Cohesion Funds, InvestEU, and Recovery and

⁸ As the Renovation Wave acknowledges: “Today, only 11% of the EU existing building stock undergoes some level of renovation each year. However, very rarely, renovation works address energy performance of buildings. The weighted annual energy renovation rate is low at some 1%. Across the EU, deep renovations that reduce energy consumption by at least 60% are carried out only in 0.2% of the building stock per year and in some regions, energy renovation rates are virtually absent. At this pace, cutting carbon emissions from the building sector to net-zero would require centuries. It is time to act” (European Commission, 2020).

Resilience Facility; development of a network of one-stop-shops; and investment schemes based on EnPC to target public buildings and social housing (European Commission, 2020).

The Renovation Wave communication focuses on increasing energy renovation rates, which should be doubled from 1% to 2%, especially deep renovations. The latter type of renovation involves reducing energy consumption by at least 60%. To respond to this challenge, it prioritizes a series of areas of intervention which are able to foster EnPC development and shaping the type of projects:

- Strengthening information, legal certainty, and incentives for renovation,
- Reinforced, accessible, and more targeted funding, along with setting up re-financing vehicles,
- Increasing capacity and technical assistance,
- Creating green jobs, upskilling workers, and attracting new talent,
- Sustainable building environment,
- Placing an integrated participatory approach and neighbourhood-based approach at the heart of the renovation,
- Addressing energy-poor households and worst-performing buildings,
- Public buildings and social infrastructure showing the way (exemplarity),
- Decarbonizing heating and cooling.

3.1.2 Next Generation EU

In addition to specific packages for energy efficiency and buildings performance, the EU has deployed the Next Generation EU to help MSs recover from the Covid pandemic by investing in sustainability, resilience and digitalization (European Commission, 2020). The Next Generation EU includes the Recovery and Resilience Facility (RRF), with funding of €723.8 billion in grants and loans to Member States' investments taking place between 2020 and the end of 2026 but with a focus on the 2021-23 period. Additional funds of the Next Generation EU support the Horizon 2020 and InvestEU programmes, amongst others. Further contributing to the RRF, the REPowerEU responds to the energy cost and security issues brought about in 2023 by the Russian invasion of Ukraine by increasing the binding EU energy efficiency target proposed by the Commission to 39% for final energy, to 41.5% for primary energy and 45% for renewable energy (respect to the 2007 Reference Scenario projections for 2030). The REPowerEU made available additional funding as a part of the RRF (€225b in the forms of loans and €75b in grants– an additional €25.4b could be made available), rising RES targets to 45% in the RED (supported with €86b) (EC - European Commission, 2022). One of its flagships is building renovation. This way, the Multiannual Financial Framework (MFF) 2021-2027 (€ 1.211 trillion) adds to the € 806.9b from the Next Generation EU (Figure 1, Box 3).

Figure 1. Overview of the Multiannual Financial Framework 2021-27 concerning the Next Generation EU and the Recovery and Resilience Facility.



Source: BPIE, 2021.

Box 3. The Recovery and Resilience Facility (RRF) of the Next Generation EU and the National Recovery and Resilience Plans (RRP)

The Recovery and Resilience Facility (RRF), established in February of 2021, is the largest funding instrument of the Next Generation EU strategy to counter the socio-economic impact of the COVID pandemic whilst fostering sustainability, resilience, and green and digital transitions. The facility made available €723.8 billion in grants and loans to Member States' investments taking place between 2020 and the end of 2026. The RRF funds are allocated based on the Recovery and Resilience Plans (RRP) presented to the EC by the Member States, according to their alignment with the country-specific recommendations of the European Semester, the NECPs, and six pillars (FIG): (a) green transition; (b) digital transformation; (c) smart, sustainable and inclusive growth, including economic cohesion, jobs, productivity, competitiveness, research, development and innovation, and a well-functioning internal market with strong SMEs; (d) social and territorial cohesion; (e) health, and economic, social and institutional resilience, with the aim of, among other, increasing crisis preparedness and crisis response capacity; and (f) policies for the next generation, children and the youth, such as education and skills. Additionally, there are eleven criteria for evaluating the national RRP. The six pillars and the eleven criteria do not directly reference the promotion of EnPC, ESCOs, or reducing financial and technical risks in projects addressed to improve energy efficiency or building performance. At least 37% of the funds requested in RRP need to address climate-related investment and policy.

Since the announcement of the Next Generation EU, there have been growing expectations regarding the use of the RRF and the InvestEU mechanism to support EnPC development. Member States could earmark RRP money for EnPC-qualified ESCOs, and use InvestEU funds to provide guarantees for ESCOs, hence de-risking projects and leveraging private finance (European Commission, Directorate General for Energy, 2022). According to the EC, there is a potential for the RRF to support areas (2020) which appear to be relevant for EnPC market development:

- a. investment schemes associated with EnPCs in public buildings and social housing;
- b. the deployment of a network of one-stop shops for building renovation at the national level;
- c. the replication of the ELENA model for project development assistance at the national level to prepare a strong and aggregated pipeline of investment projects; and
- d. financing schemes with a high potential of scaling up building renovation and the innovative deployment of EE financing products by commercial banks, on-bill and on-tax financing.

The expectation generated by this unprecedented availability of public funding could have resulted in effects on the EnPC market already in 2020, especially in a context of limited activity caused by the Covid pandemic.⁹

3.1.3 Energy Efficiency Directive

A set of key areas of the EED (2012/27/EU) as amended in 2018 (2018/2002/EU) are under revision and relevant for EnPC developments. As regards the general framework for energy efficiency investments, the EED recast **provides a legal basis for the Energy efficiency first principle (Art. 3)** to be applied to legislative, investment and planning decisions and hence the development of approval and monitoring mechanisms. These can be key for data availability to support EnPC market development based on its capacity to deliver guaranteed savings.

The recast also provides for a minor adjustment in the definition of EnPC in its Art 2 (29):

'Energy performance contracting' means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where ~~investments~~ (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.

⁹ Regardless that the adoption of the Next Generation EU took place at the end of 2020 and that of the RRF in February 2021, and decisions on fund allocation to MSs took place throughout 2021 and 2022, the expectations were already reported for public EnPC markets in Moles-Gruoso, et al. 2021.

An important article supporting the development of the EnPC market is the new Article 27 on Energy Services, which replaces Article 18 in EED. The current provisions gain strength through these requirements on MSs:

- To encourage public bodies to use energy EnPC for renovations of large buildings and to combine EnPC with demand response and storage.
- To assess the feasibility of using EnPC renovations of large non-residential buildings (above 1000 m²), always assess the feasibility of using an EnPC.
- Increased attention on the role of advisory bodies, independent market intermediaries, and one-stop shops.
- To develop quality labels and make the list of energy services providers and qualified professionals publicly available.
- To develop and publicize model contracts, tendering guidelines, best practices for using EnPC in the public sector, and a database of implemented or ongoing EnPC projects.

Other areas under revision which are of relevance for the uptake of EnPC are:

- Article 5 on the Exemplary role of public bodies' buildings, which currently requires the renovation of 3% of the building area heated or cooled and owned or occupied by central government bodies becomes Article 6 and , is being reviewed for its requirements to be made extensive to all buildings owned by public bodies.
- Article 6 on Purchasing by public bodies becomes Article 7 on Public procurement and extends the obligation to take into account the energy efficiency requirements by all public administration levels, removes conditionalities with regard to cost-effectiveness, technical and economic feasibility (application of the energy efficiency first principle in public contracting), and requires MSs to provide technical support to public bodies and to encourage aggregated procurement.¹⁰
- Article 7 on Energy savings obligations becomes Article 8 and increases the annual obligation to 1.5% for all MSs whilst prioritizing actions in vulnerable dwellings.¹¹
- Article 21 invites MSs to establish mechanisms for handling complaints and for the out-of-court settlement of any dispute arising.

3.1.4 Energy Performance of Buildings Directive

The EPBD Directive (2018/844/EU) – transposed in March 2020 – introduced new targets to accelerate the cost-effective renovation of existing buildings through national long-term renovation strategies (LTRSs). In these LTRS, Member States had to state the financial measures to be put in place to meet 2030, 2040 and 2050 targets and to stimulate cost-effective and holistic deep renovation. The directive also introduces a mandate regarding integrating electromobility infrastructure and new provisions for integrating smart technologies and building systems. The directive also required Member States to improve the transparency of the national building performance certification systems, further fostering efforts of comparing performance through the EU Building Stock Observatory (BSO),¹² launched in 2016 as part of the Clean Energy for All Europeans package. The Directive also announced the launching of the Smart Finance for Smart Buildings initiative to unlock €10 billion of new public and private funds.¹³

The Fit for 55 communication includes provisions for the recast of the EPBD. The current proposal for a recast of the EPBD emphasizes areas of direct relevance for the future of the EnPC market. It emphasizes that “Member States shall promote the roll-out of enabling funding and financial tools, such as ... energy performance contracting” and guide investments towards the use of Eurostat-compliant EnPC in the public sector(Art 15 (4); continues to recognize that the use of EnPC frees systems from inspection obligations (Art. 20); requires MSs to establish “technical assistance facilities, including through one-stop-shops, targeting all

¹⁰ The proposal makes reference in its appendix VI to the need to abide by Union green public procurement criteria in domains including data centres, server rooms and cloud services, road lighting and traffic signals, computers, monitors tablets and smartphones (COM/2021/558 final).

¹¹ See also Article 7a on Energy efficiency obligations schemes which becomes article 9.

¹² https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/eu-bso_en

¹³ The data available in the EU BSO can be useful for assessing progress overall, but not to assess the potential in public and private sectors, and the adoption of sector specific tools such as EnPC. The information on the sector's (residential and non-residential) status of renovation, potentials is not available. (Reviewed DEEP, Building Stock observatory, and JRC EPBD progress report 2021). The DEEP and BSO databases do not disaggregate public vs private. Different types of buildings and renovations need to be taken into account to assess their potential EnPC-ability.

actors involved in building renovations, including home owners and administrative, financial and economic actors” (Art. 15); and to maintain regularly updated lists of qualified or certified service providers” (Art. 22). Art. 3 on National building renovation plans (substituting Art. 2 on long term renovation strategies) leaves the option for MSs when reporting on their “capacities in the construction, energy efficiency and renewable energy sectors” to indicate the “number of energy service companies”. Also, it is optional to report on “Policies and measures with regard to ... the promotion of the energy services market” as a part of the implemented and planned policies and measures (Annex II).

More generally, the proposal includes additional provisions on energy performance but also for expanding its scope into building decarbonisation (e.g. through the inclusion of life-cycle emissions into building certificates); defining deep renovation; and setting new Minimum Energy Performance Standards (MEPS) especially targeting worst-performing buildings as well as a Zero Emission Building standard (for new public buildings to meet by 2027, and all new buildings by 2030).¹⁴ Moreover, the recast EPBD requires more ambitious and detailed building renovation plans, including multi-annual financial programming, to replace current LTRS; and the phasing out of fossil fuels in buildings by 2040. A combination of strengthened energy requirements, a climate approach in building performance and disclosure, and more detailed planning, including financing provisions and stricter standards, are potential drivers for MSs to engage with implementation mechanisms that outsource the achievement of savings and can potentially provide private financing, whilst calling for the replacement of energy generation systems and the incorporation of renewables. The recast proposal also includes provisions for more comprehensive, harmonised, reliable, visible and digital Energy Performance Certificates (EPCs), as well as more trigger points for these to be issued and publicized, e.g. through a publicly available database (Articles 14, 16, 17, 19 and Annex V).¹⁵

Regarding the role of the EC, Article 26 substitutes Article 20 to state the role of the EC in providing information, amongst others, “about available financial instruments, as well as best practice examples at the national, regional and local levels. In the context of the European Regional Development Fund, the Cohesion Fund and the Just Transition Fund, the Commission shall continue and further intensify its information services to facilitate the use of available funds by providing assistance and information to interested stakeholders, including national, regional and local authorities, on funding possibilities, take into account the latest changes in the regulatory framework.”

3.1.5 Renewable energy directive

The RED II of 2018 pays attention to the use of EnPC and highlights its potential for decarbonising district heating through increased energy efficiency and renewable energy deployment (indicated in the Commission’s heating and cooling strategy) (recital 75), the need to reinforce investor certainty (European Parliament and the Council, 2018) The currently proposed recast of the Directive involves increased recognition of the need of stepping up efforts to deploy renewables in buildings and the establishment of targets for this (recital 11) (European Parliament and the Council, 2021).

3.1.6 Final reflections

Whilst the availability of new funds and EU commitment towards energy efficiency and energy performance of buildings is generally positive for EnPC markets, a renewed challenge for the energy system – and one that can affect the market interest for EnPC – is the financial and political preference for renewables and generation systems over energy efficiency. The latter must gain priority according to the Energy Efficiency First (EE1st) Principle. New targets for renewable generation (45% under Fit for 55) require increased attention to the type of renovation. Renovations should be categorized as “envelope only”, “heating only”, and “combination of envelope and heating renovation” (European Commission Joint Research Centre, 2021). The three types of interventions are necessary to speed up the urgent replacement of low-carbon heating to meet climate targets. Moreover, it appears necessary to understand the potential and development of EnPC projects. Increased interest in on-site renewable generation can compete with EnPC projects. Eurostat and EIB

¹⁴ COM (2021)802 final.

¹⁵ The publication of such databases is key to support consumers in their decision-making while buying or renting, and the financial sector in developing tailored financial instruments.

argue that for EnPC projects to be considered off-balance in the accounts of national governments, revenues generated from the export of surplus on-site energy generation need to count towards less than 50% of the guaranteed savings (Eurostat and EIB, 2018). Accordingly, interest in renewables may deter public projects and national strategies pursuing off-balance treatment (i.e., Maastricht neutrality) from engaging with EnPC. On the other hand, equal treatment of renewables and efficiency provides an opportunity for making projects attractive, hence increasing the interest for EnPC.

Another risk for EnPC originates from the RRF's limited focus on engaging private investment and the cost-effectiveness of investments in efficiency. There is the risk that its unchecked use for achieving a multiplier effect and engaging private financing contributes to the frustration of financing institutions in their attempts to engage with energy renovation of buildings (European Commission. Directorate General for Energy. et al., 2022). Moreover, the Resilience and Recovery guidelines encourage public investment that attracts private investment and avoids crowding it out. There is no conditionality in this domain or assessing the impact of the new funds, and they are potentially contrary to fiscal commitments beyond 2026 (Funcas, 2020). Off-balance contracts must extend for at least eight years. Another aspect potentially contrary to EnPC playing a key role in national RRFs is the relevance granted in the guidelines to renewable generation, i.e. the building and sector integration of almost 40% of the renewable power generation needed by 2030, which may call off the interest of governments engaged in the development of off-balance EnPC models. Moreover, the tight deadlines may have fostered a focus of MSs on accelerating, not transforming, existing NECPs, and including favourite projects (Funcas, 2020). The incentives to rely on EnPCs are their capacity to contribute to doubling the renovation rate by 2025 and fostering deep renovation. In very few cases, the EC review of the RRFs resulted in recommendations of engaging private investment and mentioning EnPC as one possible means. Arguably, a role granted to EnPC could be assessed through indicators assessing the lasting impact of the measures, establishing monitoring mechanisms, and improving public governance.

3.2 EU financial and technical support

The European Union institutions provide a wide range of technical and financial assistance for energy efficiency improvement projects, particularly for improving buildings' energy performance.

3.2.1 Research and innovation funds

Horizon research and innovation funding programmes (Horizon 2020 in 2014-2020 and Horizon Europe in 2021-2027) support Europe's global competitiveness and innovation, focus on addressing climate change, and foster 100 Climate-Neutral Cities by 2030. Horizon Europe has increased the budget from the €80b available in Horizon 2020 to €95.5b and supports innovation by reducing investment risks of green projects, creating new markets and leveraging private finance through public seed funding. Developing EnPC or other service business models is risky, so these funds are key for EnPC (European Commission, nd, a; b). In 2014-2020, Horizon 2020 supported at least 25 projects involving EnPC through Project Development Assistance (PDA) and other mechanisms. A selection of these projects is summarized in Annex 2.

3.2.2 LIFE Clean Energy Transition sub-programme

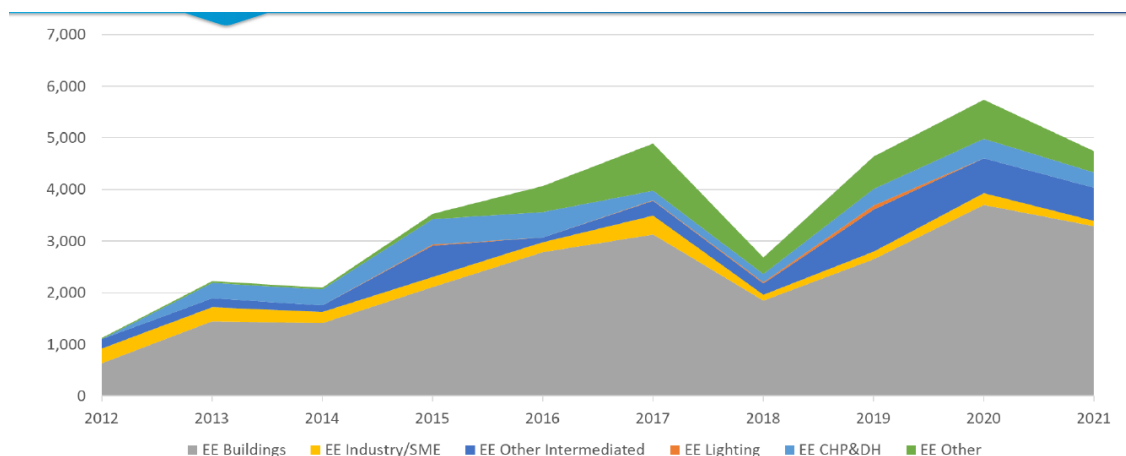
The Clean Energy Transition part of the LIFE programme builds on the success of the Intelligent Energy Europe (2003-2013) and Horizon 2020 (2014-2020) programmes. It operates with a budget of nearly €1b for the period 2021-27 to support the uptake of energy efficiency and renewable energy solutions through a series of initiatives, i.e., the European Sustainable Energy Week (EUSEW), the Covenant of Mayors Investment Forum, the Energy Efficiency Finance Market Place, the Sustainable Energy Investment Forum, BUILD UP, ManagEnergy, and the European Cities Facility. It includes a specific focus on a series of EnPC-related market uptake activities: energy efficiency market development, supporting innovative financing and business models, including performance-based, building capacity of public authorities to fulfil their exemplary role in energy efficiency, helping MSs to enhance skills and qualifications for energy efficiency related professions, raising awareness and helping to address energy poverty through energy efficiency improvements. The co-financed projects engage sectoral stakeholders and local and regional authorities in five areas of intervention: a) Building a national, regional and local policy framework; b) Accelerating technology roll-out, digitalisation, new services and business models and enhancement of the related professional skills on the market; c) Attracting

private finance; d) Supporting the development of local and regional investment projects; and e) Involving and empowering citizens.

3.2.3 European Investment Bank funding schemes

The European Investment Bank (EIB) increasingly supports energy efficiency interventions, usually through financing intermediaries but also to service providers (e.g. the EnPC provider Resalta), large energy efficiency projects, and debt funds which financial service providers (e.g. Solas Sustainable Energy Fund) (EIB, 2023).¹⁶ As a result of this mediated support to the energy efficiency and energy services market, the size of investment in EnPC is uncertain but, as shown in **Figure 2**, important, especially for buildings and DHC.

Figure 2. EIB lending to energy efficiency per sector (2012-21)



Source: Rodrigues, 2022.

The EIB also provides technical support at national and sub-national levels to develop the technical capacity to engage with EnPC. This technical support includes the review of the Slovak and Latvian EnPC model contracts for these to meet Eurostat requirements for off-balance sheet treatment; supporting the Latvian public real estate manager in developing an EnPC-based scheme for building renovation; financial analysis of a public lighting project in Vilnius; technical support in the development of a forfeiting guarantee scheme in the Czech Republic. It also includes project development assistance in the framework of ELENA, as the one provided for Ljubljana, Bratislava, and Flanders.

3.2.4 ELENA

A key Horizon program for EnPC development is the European Local Energy Assistance (ELENA), a joint initiative of the European Commission and the EIB, managed by the latter, which provides project finance and technical assistance (TA) to projects in the energy domain. Under Horizon 2020, ELENA allocated €228 million (10-15m allocated annually) to engage an estimated investment volume of €7.5 billion. ELENA continues in Horizon Europe with a budget of €130m (€30-40m allocated annually) (EIB, 2023).

ELENA support comprises 57 projects in 17 MSs, including ESCO/EnPC (35 projects completed and 22 ongoing projects) with an expected Technical Assistance (TA) of 96.4m and an overall investment of €2.9b (leverage factor of 34.1) (out of 142 projects, implemented in all MSs except Malta, Cyprus and Bulgaria, supported with €248m and a leverage ratio of 33). It increasingly allocates funds to interventions in public buildings due to the challenging nature of using EnPC in these interventions. These data show that EnPCs have received a substantial part of ELENA's support due to the need for technical capacity and multiple public bodies' capabilities to engage with it.

¹⁶ [EIB-backed Solas Sustainable Energy Fund reaches final close with €220 million of institutional investor commitments; RESALTA \(EGFF\) \(eib.org\)](#)

Of the completed ELENA projects involving EnPC, 26 included buildings and 19 included public lighting, whilst current projects – the earliest started in 2018- 20 include public buildings, and 7 include public lighting, showing a decrease in the need for support to the latter type of intervention. Examples of completed EnPC projects on buildings involve ELENA support for Milano, Ljubljana, Baden-Württemberg, and Extremadura. Several public lighting projects have been in Italy, Spain, and Croatia (Zagreb and neighbouring counties). Also, renewable generation was included in 14 completed projects and 6 current projects (the latter are in Denmark, Netherlands, Slovakia, Slovenia, Italy and Spain). Reflecting the state of development in the EnPC sector, only 2 completed and 3 ongoing projects involve residential interventions (all in the Netherlands, France and Italy).

According to information available from the EIB, during 2020-21 there were ongoing ELENA projects in 10 MSs, i.e. Belgium (Belfius Energy Project development unit), Czech Republic (Energy, Business and Advisory Platform CMZRB, Prague Energy), Germany (Efficiency for Berlin Properties), Spain (Boosting Regional ENergy TransitiOn through EEand ReneWABLEs in public buildings - RENOWABE), France (Transition Energétique du Patrimoine Public d'iparralde -TEPPI- and Bordeaux, première métropole à énergie positive : mobiliser tous les acteurs), Greece (INTEgrated sustainable enERgy ACTions and projects in Crete - INTERACT in Crete), Italy (Top Condomini); Latvia (Energy Efficiency for Lithuanian Public Buildings and Street Lighting - LITGOVEN), The Netherlands (Tilburg Sustainable Real Estate -TSRE- and Sustainable Homes and Sustainable Heat in Zuid-Holland), Slovenia (Sustainable Energy East Slovenia - SE-ES) and Slovakia (Energy Region Kosice - ENREKO).¹⁷

Some projects do not directly address the capacities to develop a specific project but the capacities of an agency to implement EnPC. For instance, ELENA supports the Vlaams EnergieBedrift (VEB) between January 2019 and December 2022 to prepare public procurement, including EnPC contracts for authorities (Vlaams EnergieBedrift, 2022). With an investment of 3.17 million over 3 years, the project intends to mobilize a total of €99m. The general rules for ELENA eligibility are (Rodrigues, 2022):

- A minimum investment of €30m, alongside support for project aggregation,
- The grant covers up to 90% of eligible project development costs,
- A minimum level of maturity (preparatory studies carried out and demonstrated commitment),
- Leverage factor required: 20 for sustainable energy projects, 10 for residential buildings and transport,¹⁸
- The obligation of implementation and to attain the minimum leverage (otherwise, ELENA could claim back the grant)
- A timeframe implementation of 3- 4 years.

3.2.5 Cohesion Policy Funds and the European Structural and Investment Funds

The cohesion policy supports job creation, business competitiveness, economic growth, sustainable development and improving citizens' quality of life. The Cohesion Policy Funds in 2021-2027 amount to €392b, allocated through a set of specific funds, i.e. the European Regional Development Fund (ERDF). They support the social and economic development of all EU regions and cities, including low-carbon economy projects in developed regions. The European Social Fund Plus (ESF+) fosters the creation of jobs and a fair and socially inclusive society in EU countries.¹⁹ The Just Transition Fund (JTF) is addressed to the regions most affected by the transition towards climate neutrality, and the Cohesion Fund (CF) provides investment to MSs with a gross national income per capita below 90% of the EU-27 average to strengthen the economic, social and territorial cohesion of the EU.²⁰

¹⁷ [ELENA – European Local ENergy Assistance \(eib.org\)](https://eib.org/en/what-we-do/eelena/eelena-projects).

¹⁸ This means that investment is required from the final beneficiary (applicant) and others.

¹⁹ ERDF and ESF+ are allocated prioritizing less developed and in transition regions but not excluding more developed regions. For more information, see: [2021-2027: Cohesion policy EU budget Allocations | Data | European Structural and Investment Funds \(europa.eu\)](https://ec.europa.eu/economy_finance/2021-2027-cohesion-policy-eu-budget-allocations-data)

²⁰ For the 2014-2020 period, the Cohesion Fund concerned Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. The Cohesion Fund allocated a total of € 63.4b during this period, and around €17b of these funds were dedicated to building renovation (European Commission 2020d). RW For the 2021-2027 period, the Cohesion Fund concerns Bulgaria, Czech Republic, Estonia, Greece, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. 37% of the overall financial allocation of the Cohesion Fund are expected to

In 2014-2020 the European Structural and Investment Funds (ESIF) encompassed the ERDF, CF, ESF, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund.²¹ During the period 2016-2020, the Smart Finance for Smart Buildings initiative (SFSB), launched by the European Commission in 2016 in collaboration with the EIB as part of the European Buildings Initiative, with the intention of building on the success of the European Fund for Strategic Investments (EFSI) “to further accelerate the renovation of buildings and support the transition to a clean energy building stock” (European Commission, 2016). Through upscaled financing, the fund was intended to develop sustainable energy financing models based on national investment platforms, making financing options more attractive to beneficiaries. Through its Pillar I, the SFSB initiative pursued more effective use of public funds by channelling and coordinating public funds to speed up the deployment of financial instruments, emphasising risk sharing. Following this package, the scope of Cohesion Funds was broadened to address improving efficiency and renewable use (Moles-Grueso, et al. 2021).

3.2.6 Modernisation fund

The Fund supports investments in the generation and use of electricity from renewable sources; improvement of energy efficiency (including in transport, buildings, agriculture, waste, and except in energy efficiency related to energy generation using solid fossil fuels); energy storage; modernisation of energy networks (including district heating pipelines, grids for electricity transmission, an increase of interconnections among Member States) in Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia. The Polish implementation explicitly refers to the use of EnPC for building renovation (to be supported with €1.3m).

3.3 Implementation by MSs

This section shows that a series of MSs refer to EnPC in their NECPs and LTRs. Few NECPs and LTRs refer to EnPC in fulfilment of Art. 5 of the EED. EnPC and ESCO are included as implementation mechanisms of the RRs only in 6 MSs and in Belgian Wallonia. The review of the national NECPs, LTRs and RRs is available in Annex 2.

3.3.1 Energy services (EED Art. 18, 2012, 2018)

In its Art. 18, the EED (2012) provided the policy framework for developing energy services by addressing the need for national EnPC model contracts, best practices, lists of qualified energy service providers, facilitation, and addressing specific barriers. The EED required MSs to promote the energy services market by:

- a) Disseminating clear and easily accessible information on available energy service contracts that guarantee energy savings (e.g., EnPC) and available financial instruments, incentives, grants and loans to support ESCO projects;
- b) Encouraging the development of quality labels;
- c) Publicizing and regularly update to lists of qualified energy service providers who are qualified and certified;²²
- d) Supporting the public sector in taking up energy service contracts, particularly for building refurbishment, by providing model contracts for EnPC (the EED amendment of 2018 lists in its Annex XIII the elements that need to be included in these model contracts) and information on best practices for EnPC.

Moreover, the EED required MSs to support the proper functioning of the energy services market by:

- a) Publicizing information points for final customers;
- b) Removing regulatory and non-regulatory barriers to energy services and EnPC;

contribute to climate objectives. For detailed data please see: [Inforegio - Cohesion Fund \(europa.eu\)](#) [Inforegio - Cohesion Fund 2014-2020 \(europa.eu\)](#).

²¹ The allocation by countries and themes is summarized in the page [Open Data Portal for the European Structural Investment Funds - European Commission | Data | European Structural and Investment Funds \(europa.eu\)](#).

²² Service providers can be certified in accordance with Article 16 of the EED.

- c) Enabling mechanisms to speed up the handling of complaints and the settlement of disputes;
- d) Enabling the role of independent market intermediaries (facilitators in this report).

In 2018, the article's implementation success was "extremely patchy", with the most successful provision being the information provision and several provisions not being adopted (Boza-Kiss et al. 2019). Fundamentally, in the 2018 report, model EnPC contracts were available in at least 14 Member States (Szomolányiová and Keegan, 2018). However, models were considered successful only in seven MSs (Austria, Czech Republic, France, Germany, Greece, Slovenia, and Spain). Moreover, the public sector's leading adoption of model contracts has not resulted in the widespread use of the model (Boza-Kiss et al. 2019). As reported in 2021, the Eurostat guidelines for the off-balance treatment of EnPC in government accounts contributed to increased interest in contract standardization. However, regulatory and procurement incompatibilities continued to be common, and the availability of updated lists of EnPC providers was uncommon. The report identified an apparent need for efforts to develop sectoral capacities and provide information, promote facilitation, and develop One-stop-shops capable of fostering EnPC projects (Moles-Grueso, et al. 2021).

3.3.2 Barriers to energy efficiency (EED Art. 19, 2012)

Art. 19 refers to the obligation of MSs to remove barriers to energy efficiency, particularly concerning legal and regulatory provisions and administrative practices involved in public purchasing and annual budgeting and accounting to avoid public bodies being deterred from, amongst others, using EnPC.

3.3.3 Energy Efficiency Obligation Schemes (EED Art 7a -2018, Art 7 - 2012)

The Energy Efficiency Directive (EED) established in 2012 under Article 7 requires MSs to set up Energy Efficiency Obligation schemes (EEOs) to ensure that energy distributors and retail energy sales companies achieve a cumulative end-use energy savings target. The EED, as amended in 2018, introduced under Art. 7a Energy Savings Obligations on MSs (European Parliament and Council of the European Union, 2012; 2018).

In 2020, 372 national policies and measures contributed to the EEOs of MSs (European Commission, Joint Research Centre, 2020). This indicates the importance of Article 7 and the opportunity it brings about saving energy at the national level. Currently, there are expectations for increasing the reported energy savings' reliability in the ongoing EED recast (CAN, 2021).

A series of country measures of direct or potential relevance directly for the development of EnPC markets, as highlighted for a series of MSs, include (Austria, Belgium, Cyprus, Czech Republic, Germany, Spain, Greece, France, Hungary, Croatia, Latvia, Poland, Slovakia and Slovenia - European Commission, Joint Research Centre, 2020):

- Austria. Targets for 2014-2020 in Federal Government buildings are to be achieved through ESCO or EnPC, and efforts are to be stepped up for 2021-2030; promotion of ESCO and EnPC through information provision.²³
- Belgium. Updated EnPC contract model for the public sector.
- Cyprus. Pursued uptake of EnPC public sector and information provision.
- Czech Republic. Promotion and facilitation of EnPC through training in public procurement and tendering and promoting ESCO models through energy providers and regional offices. Support to information centres and regional offices focusing on energy services.
- Germany. It relies on ESCO support, creating a platform for cooperation between government administrations on EnPC and the demonstration of EnPC.²⁴ The NECP also lists a comprehensive set of measures addressing building renovation, including subsidies, grants and newly introduced tax incentives, and information (The impact of the measures is not quantified.)

²³ Promotion of ESCO and EnPC models through information provision was notified by Austria, Cyprus, Czech Republic, Germany and Slovakia.

²⁴ "Measures to be implemented include annual plenary meetings and workshops, as well as a mentoring programme and exchanges of best practices. Within this framework, funding is also available for the concrete implementation of around 10-15 ambitious energy saving model contracting projects in prestigious properties in municipalities and at federal state level, with a view to exemplifying the potential of contracting and encouraging the establishment of a functioning energy saving contracting market in Germany."

- Spain. Reliance on leveraging the effect of the National Fund for Energy Efficiency and other public funds, along with information and training, especially for financial actors. Not directly linked to the use of ESCO and EnPC models.
- Greece. EnPCs are part of measures introduced for the energy performance of buildings alongside measures addressing financial mechanisms, tendering procedures, and energy audits. There is a new intention to promote EnPC in the public sector and create a database for buildings and related energy-saving projects. Alternative measures under Article 7 include energy management and reliance on ESCO models.
- France. Creation of an open database on Government building specifications, which is optional for local authorities and autonomous actors, e.g., hospitals.
- Hungary. New, stricter measures aimed at the public sector buildings, the engagement of energy auditors and government officials, and the promotion of ESCO solutions. However, there is no indication of specific policies to support ESCO and EnPC models.
- Croatia. Promote ESCO models, introduce energy management information systems (EMISs) in all public sector buildings, and develop systems for verifying real savings after building renovations.
- Latvia. The NECP recognizes the need to attract investments and avoid shortcomings in the ESCO market to continue building renovation efforts.
- Poland. Support for companies operating in the energy efficiency and RES sectors, especially to ESCOs. (No impacts quantified.)
- Slovakia. Supporting the development of EnPC with sample contracts, technical assistance, and enabling the combination of subsidy schemes with EnPCs. Other instruments that can support EnPC but are not specified as related to the model are information provision, deployment of energy management systems, and energy audits for public administrations and municipalities.
- Slovenia. Plans to continue promoting “energy contracting” (sic) in the public sector through the design of project preparation and evaluation materials, training and technical assistance.

3.3.4 Exemplary role of public bodies’ buildings (EED Art. 5 – 2012)

The public sector has led the adoption of ESCO, especially of EnPC models, through its use in public buildings and public lighting (Boza-Kiss et al., 2017; Boza-Kiss, et al., 2019; Moles-Grueso, et al. 2021): In their implementation of Art. 5 of the EED on the exemplary role of public bodies’ buildings, a series of MSs have prioritized the use of ESCO and EnPC: Austria, Cyprus, and Czech Republic (the three chose the Alternative method), Germany, and Slovakia (both defined their approach unclearly) (European Commission, Joint Research Centre, 2020). The use of EnPC as a part of exemplary actions following the default mechanism of renovating 3% of the central government buildings is therefore missing in the nationally reported strategies.

3.3.5 Long-Term Renovation Strategies (LTRS) (EPBD Art 2a - 2018)

Article 2a of the EPBD recast of 2018 (formerly, Article 4 of the EED) requires Member States to develop long-term renovation strategies (LTRSs) to mobilise energy efficiency investments that decarbonise the existing building stock by 2050 whilst setting milestones for 2030 and 2040. In general, the LTRs provide a good overview of the building stock and present a sufficiently high level of ambition to foster deep renovation and the renovation of worst-performing and public buildings but often lack the support of “comprehensive policies”.²⁵ The most comprehensive approaches reported are those of Spain, Finland and Luxemburg (European Commission, Joint Research Centre, 2021).²⁶

A review of the LTRs conducted by the EC highlighted that the “Renovation Wave Communication proposes to expand the use of ESCOs and energy performance contracts, which proved to work well in some Member States to make renovation affordable for all households, including those with a limited ability to cover costs upfront.” The report also acknowledges that “Barriers still remain, and the ESCO markets still have a great

²⁵ Reflecting on the level of ambition of the strategies, the JRC report claims that “the majority of the strategies present a high level of ambition, but this is not always supported by a comprehensive set of measures that justify the challenging 2030 and 2050 renovation targets set (i.e., EE, NL, RO) ...only few strategies have a low or moderate level of ambitions, i.e., CY and CZ.”

²⁶ https://ec.europa.eu/energy/sites/default/files/swd_commission_preliminary_analysis_of_member_state_ltrss.pdf

potential.”²⁷ A widely reported barrier identified in the review of the LTRSs is the shortage of well-qualified technical personnel. The programs mentioned to address this barrier “remain largely targeted to specific training areas and are not mainstreamed along the entire construction sector value chain.” Accordingly, the EC review recommends for innovation in the construction industry: “more structural arrangements among knowledge institutions, education and training, government, contracting authorities and contractors [and r]egular training to develop professional skills for energy auditors, designers and architects, installers of heating, cooling and other technical building systems, energy service companies, building firms, project supervisors and other experts.” Of note, the EC review does not address whether Member States consider the financing and economic instruments available compatible with or meant to support ESCO or EnPCs projects.

3.3.6 Purchasing by public bodies (EED Art. 6 – 2012)

The EED requirements on public bodies of MSs to prefer high energy-efficiency performance services, products and buildings, introduced in 2012, were not modified in the amendment to the directive in 2018. Of key relevance for the development of EnPC markets, “Member States shall encourage public bodies, when tendering service contracts with significant energy content, to assess the possibility of concluding long-term energy performance contracts that provide long-term energy savings.” An assessment of the implementation of Art. 6 EED (Luyckx and Ortega 2020) indicates a series of barriers, which furthermore are magnified in the processes associated with the adoption of EnPC

- a) Implementation requires capacity building and is time-consuming for public servants;
- b) Budgetary, legal and institutional barriers are still relevant;
- c) Further involvement of small and medium-sized suppliers is needed;
- d) Local and regional authorities need support to shift procurement habits, and networks are a powerful dissemination instrument;
- e) Around 55% of public procurement procedures continue to use purchasing cost as the only award criteria;
- f) There is a potential for simplification alongside the development of e-procurement.

3.3.7 Recovery and Resilience Plans (RRP)

This section covers three areas, the allocation of Recovery and Resilience Funds (RRF) to MSs and the Renovate and PowerUp domains; the extent to which EnPCs are included in national Recovery and Resilience Plans (RRP); and the planned use of financial and fiscal instruments by type of building.

Figure 3 shows the RRF allocation to MSs and the RRP’s allocation to PowerUP (renewables and clean technologies) and to **Renovate** (energy efficiency of buildings). **The Figure shows that for the EU overall, more than 11 per cent and 10 per cent of funds requested in June 2022 are allocated to the dimensions of renewables and clean technologies (Power Up) and energy efficiency of buildings (Renovate), respectively.** Three major groups of MS can be drawn:

- MSs with above-average fund allocation to both dimensions, i.e. Czech Republic, Denmark, and Finland;
- MSs with above-average fund allocation on PowerUp and lesser focus on Renovate, i.e. Austria, Bulgaria, Estonia, Romania, Cyprus, Malta, and Poland (the latter three do not allocate funds to Renovate);
- MSs with above-average fund allocation to Renovate, which prevails over PowerUp, i.e. Belgium, France, Greece, and Luxemburg (Luxemburg allocates 25.7% of funds for Renovate, and 0% to PowerUp).

Of note, fund allocation to building renovation can originate from funds identified as PowerUp and other domains. The latter is the case of Poland, where the ‘Clean air’ is meant partially to target targeting energy efficiency improvements in residential buildings.

²⁷ [swd-on-national-long-term-renovation-strategies.pdf \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1&plugin=1&code=sdg-11-3-1&plugin=1)

Figure 3. Absolute and relative allocation of RRFs in RRP to clean technologies and renewables and to the energy efficiency of buildings (€billion and %) (as of June 2022).

Country	1. Power up (Clean Technologies and renewables)	1. Power up (Clean Technologies and renewables)	2. Renovate (Energy efficiency of buildings)	2. Renovate (Energy efficiency of buildings)	Grand Total
Austria	0.74	16.53%	0.29	6.53%	4.5
Belgium	0.61	10.26%	1.07	18.12%	5.93
Bulgaria	1.46	22.12%	0.93	14.01%	6.61
Croatia	0.52	8.14%	0.76	11.89%	6.4
Cyprus	0.36	28.89%	0	0.00%	1.23
Czechia	1.81	25.64%	1.32	18.67%	7.07
Denmark	0.3	19.14%	0.25	15.86%	1.56
Estonia	0.14	14.36%	0.05	4.79%	0.98
Finland	0.38	18.11%	0.27	12.64%	2.1
France	3.68	8.97%	7.32	17.89%	40.95
Germany	3.32	11.86%	2.52	9.02%	27.95
Greece	1.83	10.06%	2.82	15.52%	18.19
Hungary	0.79	10.91%	0.19	2.63%	7.2
Ireland	0.05	5.54%	0.1	10.08%	0.99
Italy	15.07	7.87%	19.42	10.14%	191.5
Latvia	0.08	4.38%	0.23	12.66%	1.83
Lithuania	0.26	11.62%	0.22	9.79%	2.22
Luxembourg	0	0.00%	0.01	25.71%	
Malta	0.08	22.59%	0	0.00%	0.34
Poland	13.49	37.50%	0	0.00%	35.97
Portugal	1.23	7.39%	1.3	7.81%	16.64
Romania	4.53	15.41%	2.41	8.18%	29.39
Slovakia	0.75	11.50%	0.74	11.32%	6.55
Slovenia	0.25	9.98%	0.09	3.47%	2.48
Spain	4.72	6.79%	6.82	9.81%	69.53
Sweden	0	0.00%	0.4	12.05%	3.3
Grand Total	56.44	11.48%	49.54	10.08%	491.51

Source. The authors, based on Source: Bruegel, 2022. The colour scale compares the percentages allocated to both dimensions and ranges from the highest values (in green) to nil allocation (in red).

The EC assessment of the recovery plans evaluated most criteria with high rates. One exception is cost justification, where all MSs remained short of fully justifying the costs (Bruegel, 2022). Little detail in the description of the allocation mechanisms poses difficulty in assessing the impact of fund allocation through RRFs on EnPC markets.

As shown in **Table 1**, the inclusion of EnPC in RRFs is fundamentally less frequent in the RRFs than in the NECPs (17 MSs) and LTRs (18 MSs). Only 6 MSs and one federal region reported plans to use ESCO or EnPC models in their RRFs, i.e. Austria, Belgian Wallonia, Croatia, Poland, Slovakia, and Slovenia. In response to the need to further explore the potential use of ESCO and EnPCs, the EC has recommended these models in several MSs, including Denmark, Greece, and Ireland, and the use of ESCO models in Austria, Cyprus, Czech

Republic (the three chose the Alternative method), Germany, and Slovakia as a way to have a multiplier effect on the investment and to meet the challenges pursued in the RRP (**Table 1**).

Table 1. Presence of EnPC in the NECPs, LTRSs, and RRP of MSs

MS	NECP	LTRS			RRP
	Reference to EnPC	Mention to EnPC	Support ESCO or EnPC (planned)	Exemplary role	Use of ESCO or EnPC
Austria	YES: Saving contracting	YES	YES	YES	YES
Belgium	YES	YES	YES		NO (except Wallonia)
Bulgaria	YES	YES	YES		vague
Croatia	YES	YES	YES		YES
Cyprus	YES	ESCO	(YES- ESCO)	YES	NO
Czech R.	YES	YES	YES	YES	YES
Denmark	YES	Vague	NO		NO (advised by EC)
Estonia	ESCO	NO	NO		NO
Finland	vague	ESCO	YES		NO
France	YES	YES	YES		NO
Germany	YES	YES	YES	YES	NO
Greece	YES	YES	(YES)		NO (advised by EC)
Hungary	YES	YES	(YES)		NO
Ireland	NO	YES	YES		NO (advised by EC)
Italy	YES	YES	YES		vague
Latvia	YES: "PESCO" and "EE contract"	YES	YES		NO
Lithuania	Efficiency contracts, energy services	ESCO	(YES- ESCO)		NO
Luxemburg	NO (to be discussed)	ESCO	(YES- ESCO)		NO
Malta	ESCO	NO (assessed no potential)	NO		NO
Netherlands	YES	Vague	YES		NO
Poland	NO	YES	YES		YES
Portugal	NO	YES	YES		NO
Romania	YES	YES	YES		NO
Slovakia	YES	YES	YES	YES	YES
Slovenia	YES (EPO)	YES	YES		YES
Spain	YES	YES	YES		NO
Sweden	Energy services	NO	NO		NO
Total YES	17	18	19	5	6 and Wallonia

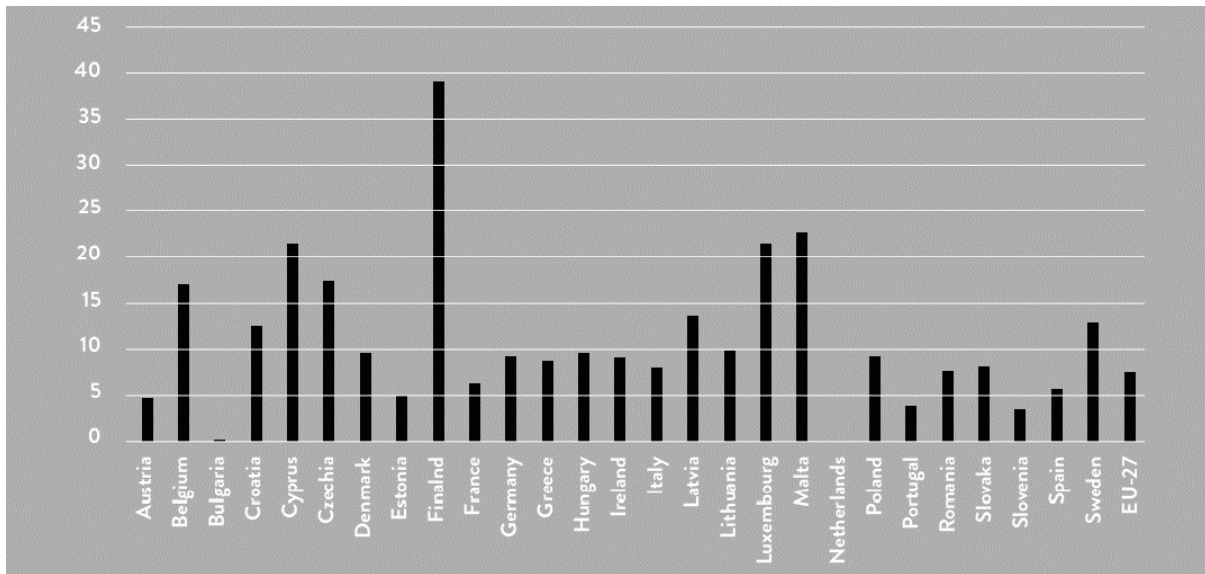
Source: National reports and EC reviews (Annex 2).

Figure 4 and **Figure 5** show the allocation to efficient renovations in MSs as a percentage of the RRP budget and in million euros. The figures show that the percentage of allocation to efficiency measures is:

- close to 40%, in the case of Finland,
- between 15 and 25% in Cyprus, Luxemburg, Malta, Belgium, and Denmark
- in the 10-15% range in Croatia and Sweden
- below the 10% of investment in energy efficiency in all other MSs.
- The EU average is also between 5 and 10%.

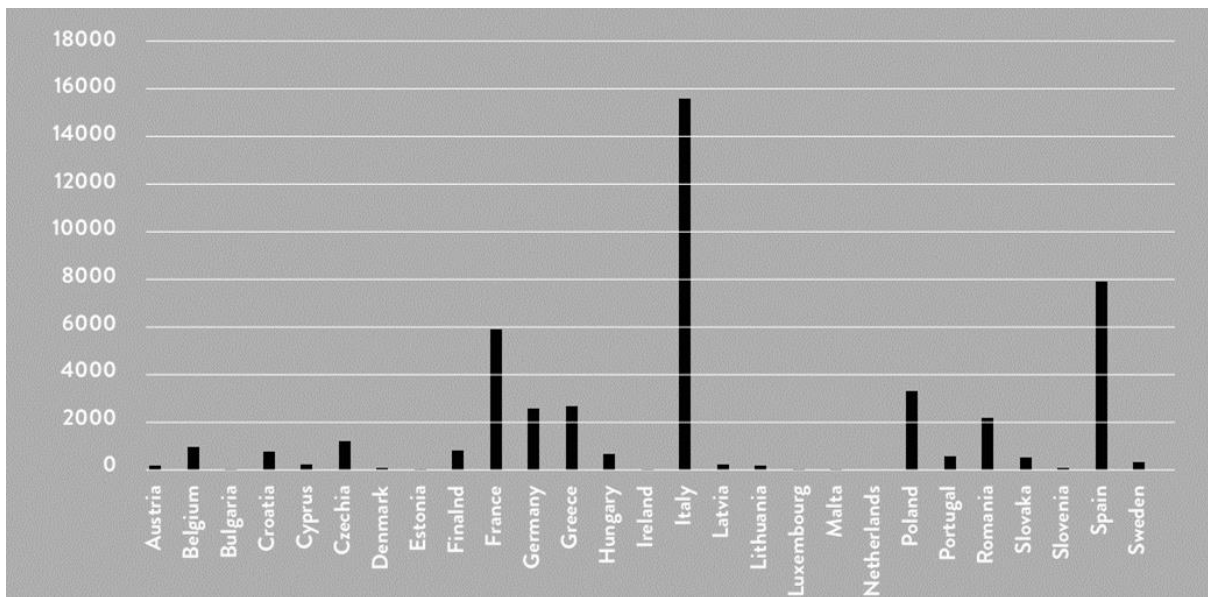
The absolute figures show that Italy, Spain and France are expected to be the major investors in efficiency measures. Germany, Greece, Poland and Romania constitute the second group of MSs expected to make major RRF allocations to energy efficiency.

Figure 4. Energy-efficient renovation spending as a percentage of the RRP's budget (%)



Source: Housing Europe, 2021.

Figure 5. Allocation of the RRF to energy efficient renovations by country, in m€.



Source: Housing Europe, 2021.

The presence of investment grants and subsidies is key to understanding the market potential for EnPCs. For instance, in 2019, grants and subsidies were the main sources of public financing and funding indicated in NECPs. Soft loans based on state guarantees and revolving funds were available for investments in the energy performance of buildings in half of the EU countries, and several MSs offered tax incentives (**Figure 6**). Grants and subsidies were most widespread in the residential sector (all MSs except Estonia and France), where EnPC is not yet well suited. However, public funding was also available for commercial and public buildings in 15 MSs. **Reliance on grants and subsidies can hamper the development of EnPC markets.**²⁸ Private financing can be boosted with seed funding from public sources. However, **grants, subsidies, and other public instruments often compete with or exclude the use of private EnPC.**

²⁸ The UK is not included in these figures.

Understanding these interactions is critical in establishing a healthy combination of investment support, national regulations and administrative rules. (The existence and relevance of these barriers are reviewed in this report (Section 8).

Figure 6. Financial and fiscal instruments by type of building (Residential, Commercial, Public) across the EU.

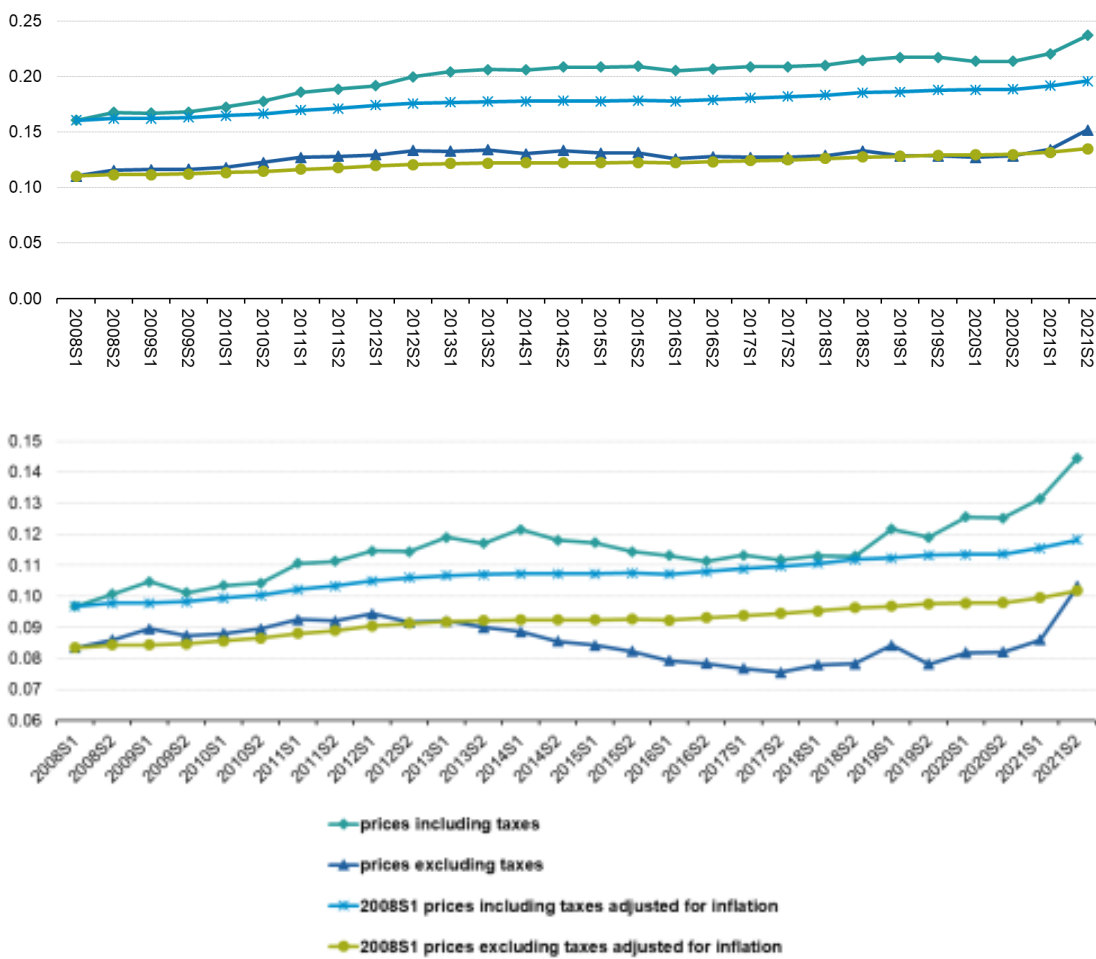
	Grants/Subsidies			Loans/Soft Loans			Tax Exemption/Reduction			Mixed schemes		
	RES	COM	PUB	RES	COM	PUB	RES	COM	PUB	RES	COM	PUB
AT	✓	✓	✓							✓		
BE	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BG	✓	✓		✓	✓	✓						
CY	✓	✓										
CZ	✓	✓	✓	✓	✓							
DE	✓	✓	✓	✓	✓	✓						
DK	✓						✓	✓	✓			
EE				✓								
EL	✓		✓									
ES	✓	✓	✓	✓						✓		✓
FI	✓						✓					
FR				✓	✓	✓	✓	✓	✓	✓	✓	✓
HR	✓	✓	✓									
HU	✓	✓	✓	✓								
IE	✓											
IT	✓	✓	✓	✓	✓	✓	✓	✓	✓			
LT	✓	✓	✓							✓		
LU	✓			✓	✓	✓						
LV	✓	✓	✓							✓		
MT	✓											
NL	✓	✓		✓			✓	✓				
PL	✓		✓							✓		
PT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
RO	✓			✓								
SE	✓						✓	✓	✓			
SI	✓		✓							✓	✓	
SK	✓	✓	✓	✓								
UK	✓	✓		✓		✓						

Source: JRC, 2020. RES stands for Residential buildings, COM for Commercial buildings, and PUB for Public buildings. The acronyms of MSs refer to the ISO 3166-1 Alpha code.

3.4 Structural factors: costs of energy and financing

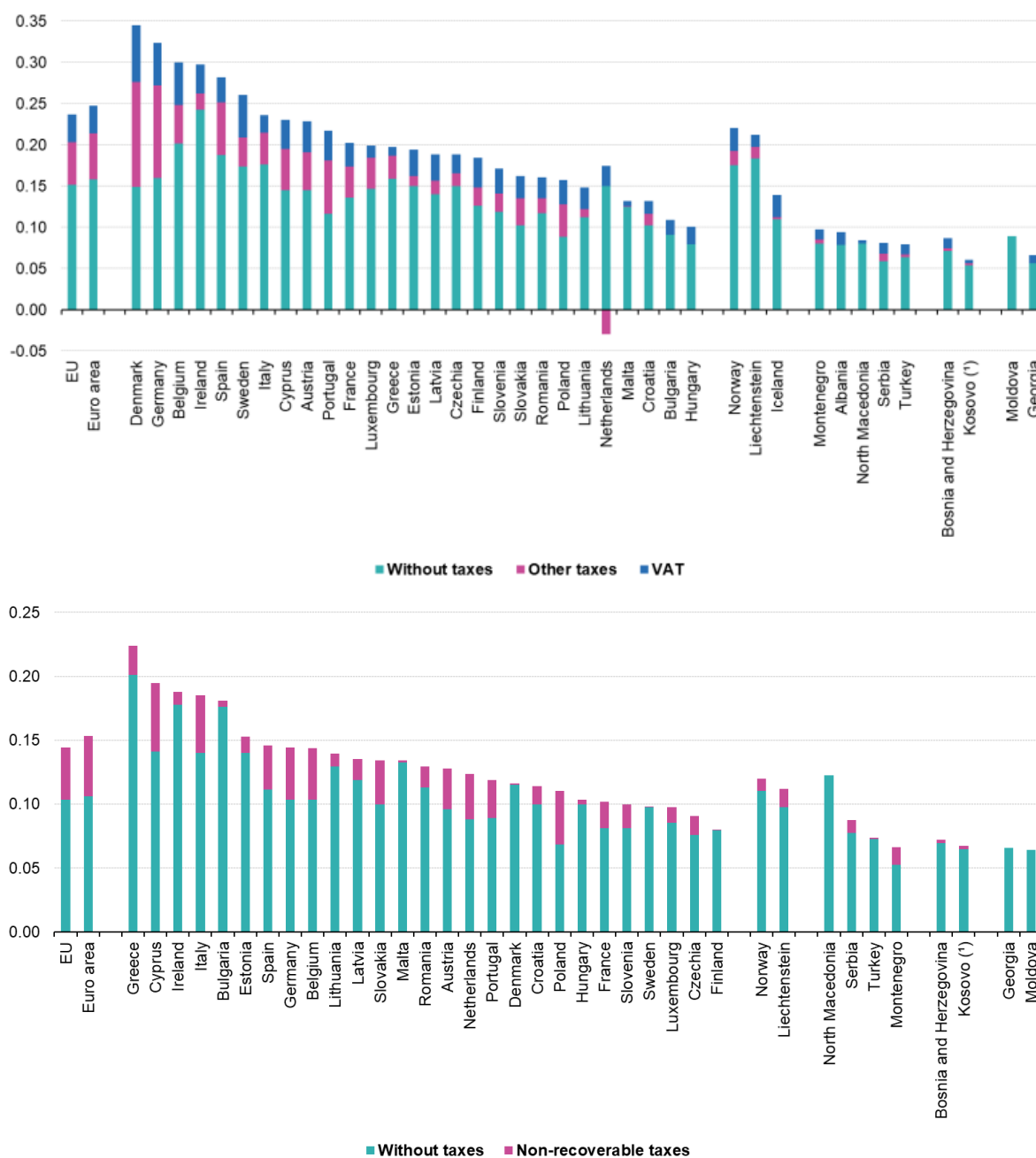
During 2020-21 there was an overall increase in energy prices for non-household consumers. Energy prices also increased during 2021 for household consumers (**Figure 7**). Major price differences between MSs are a key factor for clients to be interested in EnPC models (JRC 2021). For instance, non-residential electricity prices with taxes were above 0.15€/kWh in the second semester of 2021 in Greece, Cyprus, Ireland, Italy, Bulgaria, and Estonia and were below 0.10€/kWh in Slovenia, Sweden, Luxemburg, Czech Republic and Finland (**Figure 8**). Prices for residential electricity were higher than 0.25€/kWh in Denmark, Germany, Belgium, Ireland, Spain, and Sweden and below 0.5€/kWh in the Netherlands, Malta, Croatia, Bulgaria and Hungary. Major pricing differences for household and non-household uses are remarkable in countries such as Bulgaria or Greece and could be major drivers for the commercial and industrial sectors to engage with EnPC. The same figure also shows that prices in the EU are generally higher than in neighbouring countries and should accordingly incentivise investment in energy saving.

Figure 7. Development of electricity prices for household consumers (above) and non-household consumers (below) in the EU 2008-2021 (€/kWh)



Source: Eurostat 2022.

Figure 8. Electricity prices for household consumers (above) and non-household consumers in the EU during the second half of 2021 (€/kWh)



Source: Eurostat 2022.

Another structural factor is the cost of financing. Financing was relatively affordable during the years 2019 to 2021. At the beginning of 2022, financing costs increased (**Figure 9**), especially after the start of the Russian attacks on Ukraine. This situation does not affect the reported period (2020-21) but may have influenced the perception of participant experts, who provided their input to this report in 2022 and 2023. There are also major differences between MSs. The highest financial costs are generally available in Hungary and Poland, and the lowest is in Lithuania. Arguably, an increase in the cost of financing is generally adverse to long-term investments and EnPC, but its impact is highly context-specific. It depends, for instance, on the availability of grants or soft loans for investments in energy saving, differences in access to financing between government bodies and EnPC providers, and the sensitivity of the financing actors to investments in energy saving or, more particularly, to EnPC.

Figure 9. Long-term interest rate in the EU 1970-2020



Source: European Central Bank 2022.

4 Market size

4.1 Current status

This section assesses the market size of the public and private sectors of MSs in terms of the number of contracts and million euros, both in absolute terms and related to the size of the economy. **Figure 10** shows that in 2020-21 the most active markets in absolute values were Spain, Germany (both MS have a large number of contracts) and France (whose number of contracts is moderate, but these contracts are large). Experts also point to a sizeable market having developed in Belgium. Also, the figure shows that highly variable data was obtained in several MSs (most fundamentally in Austria, Belgium, Germany, Hungary, Italy, Poland and Spain, in bold. Also, insufficient data was collected to provide an estimate in Luxemburg and private markets of Hungary and France, and there are major differences between the sum of MS markets and the estimates received at the EU level. National databases and reports collecting the number of ESCOs, especially EnPCs, are missing for most MSs, besides Germany, France, Spain, and the Netherlands. However, these databases have limitations in capturing the size of EnPC markets.²⁹

The study of the EU-level and MS-level estimates shows that the public market could be twice to four times the size of the private market in terms of annual investment (€1.9-4b in contracts signed in the period 2020-21). EU-level and MS-level estimates coincide in claiming that private contracts in the period amount to €1-1.1b.

²⁹ Additional data limitations relate to the limited availability of expert responses, in MSs where only one expert response was obtained to assess the market size (Austria, Czech Republic, Denmark, Finland, Lithuania, Poland, Portugal) and to the existence of databases of the government and ESCO associations that may include other contract modalities (e.g. energy contracting in Germany and chauffage in France), risk overestimating the market activity of less active providers (may be the case of Spain), or fail to assess the latter (the Netherlands -latest market review conducted in 2019).

Figure 10. Market size of EnPC in MSs and the EU during 2020-21, in number of contracts and million euros

MS	Number of contracts			Overall size (m€)		
	Public	Private	Overall	Public	Private	Overall
Austria	40	60	100	36.0	30.0	66.0
Belgium	50	30	80	150.0	85.0	235.0
Bulgaria	8	0	8	2.5	0.0	2.5
Croatia	15	5	20	10.0	2.5	12.5
Cyprus	0	3	3	0.0	1.0	1.0
Czech R.	11	2	13	27.0	1.2	28.2
Denmark	8	7	15	25.0	10.0	35.0
Estonia	0	0	0	0.0	0.0	0.0
Finland	4	14	18	2.0	8.0	10.0
France	88	nd	88	1100.0	nd	1100.0
Germany	200	300	500	400.0	240.0	640.0
Greece	27	13	40	13.0	8.5	21.5
Hungary	nd	nd	30	nd	nd	15.0
Ireland	5	7	12	22.0	10.0	32.0
Italy	50	20	70	50.0	2.0	52.0
Latvia	0	1	1	0.0	0.3	0.3
Lithuania	6	0	6	4.2	0.0	4.2
Luxemburg	nd	nd	nd	nd	nd	nd
Malta	0	0	0	0.0	0.0	0.0
Netherlands	6	74	82	5.0	60.0	65.0
Poland	15	25	40	15.0	6.3	50.0
Portugal	5	0	5	50.0	0.0	50.0
Romania	0	0	0	0.0	0.0	0.0
Slovakia	30	5	35	15.0	5.0	20.0
Slovenia	12	1	13	36.0	0.5	36.5
Spain	175	525	700	190.0	570.0	760.0
Sweden	0	0	0	0.0	0.0	0.0
EU estimates	2000	700	2700	4000.0	1000.0	2502.5
EU Sum	755	1092	1879	2152.7	1040.3	3236.7

Source: JRC, based on EU Survey 2022. Size of the MS economies according to the World Bank (2022).³⁰ Values in bold indicate large variability between estimates. The colour code indicates the largest magnitudes in green and the smallest magnitudes in red, ranked for each magnitude. "nd" indicates Insufficient data to estimate the market size.

Looking into the ratios of the market size in terms of the number of contracts and the economic size of the EnPC market with respect to the economies of MSs (**Figure 11**) provides a more representative picture of the relevance of EnPC markets in the respective MSs. The overall (public and private) markets were categorized into largest, mid-sized, small to mid-sized and smallest:

- The largest EnPC markets, in descending order of the number of contracts, are Spain, Slovakia, Croatia, Slovenia, and Austria. Economically, Slovenia, Spain, Belgium, and France are the largest markets, followed by far from Portugal (ratios above 200, and marked in darkest shadows of green in the Figure). The difference between both ratios shows that contracts in Slovenia, Belgium and France are relatively large.

³⁰ [GDP \(current US\\$\) - European Union | Data \(worldbank.org\)](https://data.worldbank.org/ny/gdp/cv?locations=EU)

- Regarding the number of contracts only, some claims situate Greece, Hungary, Belgium, Bulgaria and Cyprus as mid-sized markets (ratios between 100 and 199, marked in light shadows of green). The presence of these MSs in the mid-size category needs to be regarded with caution, especially in the cases of Hungary and Cyprus. There are large discrepancies amongst respondents about Hungary's activity, including claims about this market not having taken off. Hence, in addition to insufficiently consolidated information, there may be some definitional confusion about what computes as EnPC. Claims for Belgium were also largely divergent, and this market is difficult to assess due to the existence of four federal areas. Due to the country's small economy, Cyprus appears as a mid-sized market because a single, relatively small contract took place.
- Regarding the economic relevance of the EnPC market, mid-sized markets are Croatia, Slovakia, Germany, and Austria. This ratio provides a more reasonable picture of the size of these markets, where EnPC has a long tradition. The German market may be even larger. However, the divided nature of the market in one such federal state and the availability of official data combining different contracting modalities makes it difficult to assess the market's reality.
- The mid-sized to small markets in terms of the number of contracts are, in descending size, Lithuania, the Netherlands, Finland, and Poland. Regarding economic relevance, the mid-sized markets are Greece, Denmark, Hungary, Ireland, Lithuania, Poland, and the Netherlands (ratios between 50 and 99, marked in shades of yellow). Differences between the countries listed according to both ratios indicate the relatively large number of contracts in Ireland, Denmark and the developing Greek market (projects aggregated with ELENA support) and the moderate size of Finnish contracts.
- The smallest markets regarding the number of contracts are Czech Republic, Denmark, Italy, France, Latvia, Ireland, and Portugal. In economic terms, the smallest markets are Cyprus, Bulgaria, Finland, Italy, and Latvia (ratios between 1 and 49, marked in shades of orange). This group of countries encompasses some large economies such as Italy and France. Results for Italy need to be used with caution. They reflect a lack of national-level information and highly divergent responses of experts as well as the impact of grants on the interest of clients for EnPCs and may also be the result of the Covid pandemic, whose effects were most dramatic in this MS. Evidence suggests that the market has largely contracted during the reviewed period. In France, Portugal, and Czech Republic, the market size is not well represented by the number of contracts because these tend to be large. In Latvia, the development of the public residential sector stopped in the post-Covid period.
- A reported lack of activity refers to Sweden, Malta, Romania, and Estonia.³¹ The absence of expert responses to the EU Survey 2021 and to previous consultations conducted as a part of previous JRC reports could also indicate the absence of an active EnPC market in Luxembourg.

Regarding the activity in public (public buildings and lighting) and private sectors (commercial buildings and industry), a series of MS typologies can be differentiated based on the highest of their ratio pairs (number of contracts or economic value of the EnPC market as related to the size of the MS economy):

- Large activity, especially in the public sector, in 6 MSs (at least one ratio, number of contracts or economic value of the EnPC market above 200), i.e., Belgium, Croatia, Portugal, Slovakia, Slovenia and probably France (where no data was found available for the private sector).
- Mid-sized activity and small to mid-sized activity in the public sector and smaller activity in the private sector in 5 MSs (at least one ratio, number of contracts or economic value of the EnPC market between 100 and 199 and 50 to 99), i.e. Bulgaria and Greece (mid-sized public sector), followed by Czech Republic, Lithuania, Denmark (small to mid-sized public sector).³²
- Mid-sized markets in both the public and private sectors in 2 MSs (at least one ratio, number of contracts or economic value of the EnPC market between 100 and 199 and 50 to 99), i.e. Belgium and Germany.
- Leading private sector activity in 5 MSs, i.e. Spain, the Netherlands, Finland, and to an extent in Cyprus, Latvia.³³ (This applies to Austria and Poland based on the ratio for the number of contracts.)

³¹ There are also claims about an absence of activity in Hungary which contrast with claims of experts working in different sectors.

³² This category is also applicable to Germany and Austria but only in regard to the ratios for economic size and number of contracts, respectively.

³³ In Spain, the private market is in the largest range (at least one ratio above 200). In Austria and Cyprus, the private market is in the mid-sized range (at least one ratio, between 100 and 199). In Finland, the private sector is in the small-size range but well above the public sector (ratios between 0 and 49).

- Limited or nil activity in the public and private sectors in 7 MSs, i.e. Bulgaria, Cyprus, Finland, Latvia, Poland, Romania, Sweden, Malta, and Estonia (ratios EnPC/ national economy below 40 for the sectors). (The very variable data for Italy indicates that activity dramatically slowed in 2020-21.)
- Data limitations make difficult the comparison of public and private sector sizes in three MSs, i.e. Luxemburg (likely inactive market), Hungary and France.

Based on this assessment, it can be argued that although the public sector has greater activity than the private sector, the initiative in the latter is notable, and in some MSs leads the market. Whilst there is a majority of MSs where the public sector leads the activity of EnPC markets (11 MSs), there is a sizeable group of MSs with a similar level of activity in both sectors (5 MS). In 9 MS, there is limited to nil activity (7 MS), and there could be a potential for the public sector to lead the development of EnPC markets. Data is needed, especially in Luxemburg and Hungary, as well as the French private sector.

Figure 11. Ratio between the market size of EnPC – in number of contracts and million euro – and the size of the national economy – in trillion euro – during 2020-21

MS	Ratio number of contracts to MS economy (trln€)			Ratio EnPC (m€) to size of the economy (trln€)		
	Public	Private	Overall	Public	Private	Overall
Austria	84	126	210	75	63	138
Belgium	83	50	133	250	142	392
Bulgaria	100	0	100	31	0	31
Croatia	221	74	295	147	37	184
Cyprus	0	108	108	0	36	36
Czech R.	39	7	46	96	4	100
Denmark	20	18	38	63	25	88
Estonia	0	0	0	0	0	0
Finland	13	47	60	7	27	33
France	30	nd	30	374	nd	374
Germany	47	71	118	95	57	152
Greece	125	60	185	60	39	99
Hungary	nd	nd	165	nd	nd	82
Ireland	10	14	24	44	20	64
Italy	24	10	33	24	1	25
Latvia	0	26	26	0	8	8
Lithuania	92	0	92	64	0	64
Luxemburg	nd	nd	nd	nd	nd	nd
Malta	0	0	0	0	0	0
Netherlands	6	73	81	5	59	64
Poland	22	37	59	22	9	74
Portugal	20	0	20	200	0	200
Romania	0	0	0	0	0	0
Slovakia	261	44	305	131	44	174
Slovenia	195	16	211	585	8	593
Spain	123	368	491	133	400	533
Sweden	0	0	0	0	0	0
EU estimates	117	41	158	234	59	146
EU Sum	44.2	63.9	110.0	126.0	63.9	63.9

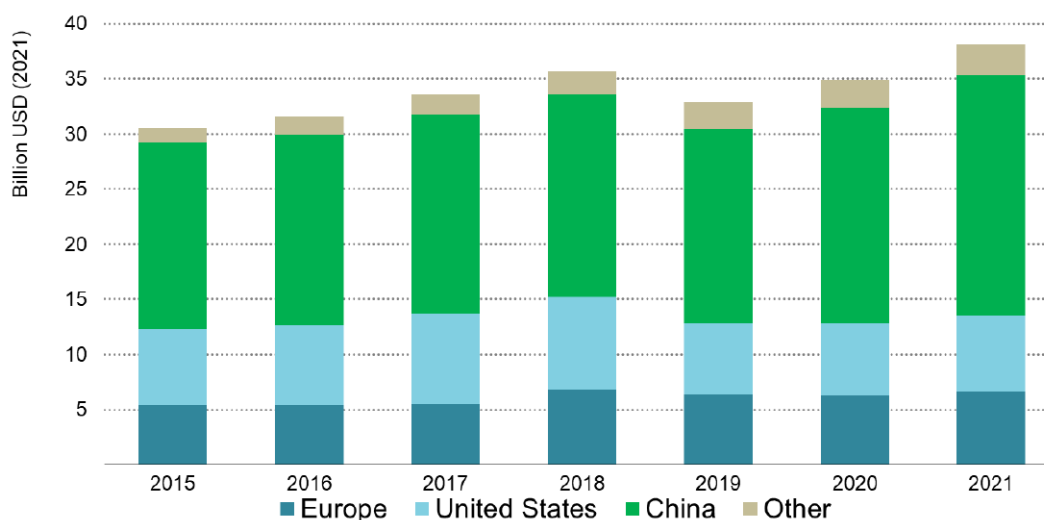
Source: JRC, based on EU Survey 2022. Size of the MS economies according to the World Bank (2022).³⁴ Values in bold indicate large variability between estimates. The colour code indicates the largest magnitudes in green and the smallest magnitudes in red, ranked for each magnitude. "nd" indicates Insufficient data to estimate the market size.

³⁴ [GDP \(current US\\$\) - European Union | Data \(worldbank.org\)](https://data.worldbank.org/ny/gdp?locations=EU)

4.2 Evolution and perspective

ESCO markets are on a growing trend in the EU and other economies (**Figure 12**). In the EU, the ESCO market has continued to grow after a small fallback in 2018 and 2019 related to uncertainty about the statistical treatment of investments in government accounts.

Figure 12. Evolution of ESCO investment in Europe, the United States and China (2015-2021)



Source: IEA 2022.³⁵

In this study, the assessment of the EnPC market evolution in 2020-21 was estimated using two metrics, the number of contracts per MS compared to the values found in previous JRC reports and expert estimates on the market trends. The latter metric was also used to assess the perspective for 2022-23 (**Figure 13**). The number of contracts and the expert assessment indicates that at the EU level, there has been a growth of the EnPC market in the period 2020-21 with respect to the overall EnPC market assessed in 2015-16. The public EnPC market has also grown since 2018-19. Data is supporting a reduction in the markets of Croatia, Estonia, Italy, Latvia, and Portugal. Some data also supports a reduction in market size in Czech Republic, Slovenia, Sweden and Slovakia:

- As supported by the trends identified by experts, a market size reduction has occurred in the public and private EnPC sectors of 6 MSs Croatia, Estonia, the public sector of Denmark, Italy, Latvia, and Portugal.
- As supported by the number of contracts, a reduction of activity has occurred in the public markets of 7MSs Czech Republic, Italy, Portugal, Slovenia and Sweden concerning 2018-19. The same applies to the overall market of Portugal and Slovakia.

Major dissonances between the data on the number of contracts and expert estimates on trends occur in the cases of Croatian and Dutch public markets and both the public and private markets of Slovenia and Germany. In Slovenia, a slight reduction in the overall market was identified with respect to the period 2015-16 and the public market with respect to 2018-19. However, the consulted experts considered that in 2020-21 the public market grew. This situation appears to reflect a new take-off after disruption related to the publication of Eurostat guidelines on treating EnPC in public accounts in 2017 and 2018 and the Covid pandemic. In Germany and the Netherlands, overall (between 2015-16 and 2020-21), public sector market developments (between 2018-19 and 2020-21) are not reflected by expert estimates, potentially indicating that national databases from public agencies and ESCO associations may be overestimating the situation, or that the latter was underestimated in the past.

³⁵ IEA (2022). World Energy Investment 202, cited in Schenk, 2022.

Regarding public sector trends between 2018-19 and 2020-21, market size estimates and expert claims about trends are generally aligned and show a general development of public markets of the EU in the period 2020-21:

- Activity has been significantly large in the public markets of 7 MSs, i.e., Austria, Belgium, France, Germany, Greece, Slovakia, and Spain. Expert estimates were less optimistic and indicated a stable market for Germany and Spain.
- Activity has been stable in the public markets of 9 MSs, i.e. Bulgaria, Denmark, Finland, Ireland, Lithuania, Netherlands, and Poland.
- Activity has contracted in the public markets of 6 MSs, which, moreover, had good perspective in previous JRC reviews, i.e. Croatia, Czech Republic, Estonia, Italy, and Slovenia (according to the number of contracts reported, but in contrast with expert estimates, which indicate a fast-growing market), Portugal, Latvia and Sweden (the latter two public markets have come to a halt).
- The public markets of Cyprus, Malta and Romania have failed to take off.³⁶

The private sector dynamics are the most difficult to assess, partly due to the lack of recently published data. Expert assessment of the trends shows that during 2020-21, EU private markets grew in the EU but failed to take off or contracted in several MSs where activity had been expected:

- Activity increased or took off in 9 MSs, i.e. Belgium, Cyprus (1-3 small projects), Finland, France, Hungary, Ireland, Poland, Romania (reflecting market optimism regardless of the absence of contracts), and Slovenia (in contrast with the reported reduction in the number of contracts);
- Activity remained stable in 7MSs, i.e. Austria, Denmark, Germany, Italy, Netherlands, Slovakia and Spain;
- Activity failed to take off in 6 MSs, i.e. Portugal, Czech Republic, Greece, Lithuania, Sweden and Bulgaria (maybe also in Hungary and Luxemburg);
- Activity contracted in 3 MSs, i.e. Croatia, Estonia and Latvia.

Regarding future trends, expert estimates indicate:

- There are expectations for growth, especially in Belgium, France, Germany, Ireland, Poland, Spain and the public markets of Czech Republic and Spain, but also in Austria, Bulgaria, Cyprus, Denmark, Finland, Greece, Hungary, Italy, Latvia, the Netherlands, Romania, Slovakia, and the private sectors of Czech Republic and Slovenia.
- Market contraction is forecasted only in Croatia (for both public and private markets).
- There are no expectations for markets to take off in 3 MSs, i.e. Romania, Sweden and Malta.
- Slightly greater growth is expected for private markets than for public markets.

Several national experts reported that the perspectives largely depend on the implementation of the RRP, which, as reported in Section 3, have been only found to support EnPC in Austria, Wallonia, Croatia, Czech Republic, Poland, Slovakia and Slovenia (and may be incorporated in Greece, Ireland and Denmark if the MSs follow the advice of the EC). Other factors creating uncertainty about the perspective of EnPC include its adoption in the industry, EU decarbonization targets, and factors including energy price increases, affordability of renewable technologies and systems' electrification. These factors may result in new opportunities for EnPC or integration with other contract modalities (Section 6). A review of previous JRC reports shows that expert perspectives must be taken cautiously, as these tend to be overly optimistic.

³⁶ Such is probably the case of Luxemburg and Malta. In the latter case, authorities have reported no longer pursuing the development of EnPC markets due to structural reasons.

Figure 13. Market trends based on the assessed number of contracts and expert estimates.

MS	Overall		Public		Private	Public	Private	Public
	2015-16	2020-21	2018-19	2020-21	2019-21	2019-21	2022-24	2022-24
Austria	53	100	11	40	→	↗	↗	↗
Belgium	10	80	11	50	↑	↑	↑	↑
Bulgaria	5	8	10	8	→	→	↗	↗
Croatia	7	20	50	15	↓	↓	↓	↓
Cyprus	0	3	0	0	↗	→	↗	↗
Czech Republic	45	13	25	11	→	↑	↗	↑
Denmark	11	15	9	8	→	↓	↗	↗
Estonia	"few"	0	2	0	↓	↓	→	→
Finland	8	18	5	4	↗	→	↗	↗
France	40	88	50	88	↗	↗	↑	↑
Germany	30	500	58	200	→	→	↑	↑
Greece	5	40	8	27	→	↗	↗	↗
Hungary	2	30	20		↗	↗	↗	↗
Ireland	-	12	4	5	↗	↗	↑	↑
Italy	50	70	230	50	→	↘	↗	↗
Latvia	0	1	6	0	↘	↘	↗	↗
Lithuania	4	6	6	6	→	→	→	↗
Luxemburg	1	nd	0	nd	→	→	→	→
Malta	0	0	0	0	→	→	→	→
Netherlands	27	82	-	6	→	→	↗	↗
Poland	15	40	13	15	↑	→	↑	↑
Portugal	15	5	13	5	→	↓	↗	↗
Romania	0	0	0	0	↑	→	→	→
Slovakia	45	35	25	30	→	↗	↗	↗
Slovenia	15	13	44	12	↗	↑	↗	→
Spain	200*	700	59	175	→	→	↑	↑
Sweden	6	0	1	0	→	→	→	→
EU Estimates		2700		2000	↗	↗	↑	↗
EU Sum	594	1909	617	755				

Source: JRC, based on EU Survey 2022, JRC 2021, JRC 2019, and JRC 2017. Values in bold indicate large variability between responses. The colour code indicates the largest magnitudes of the period pairs in green and the smallest magnitudes in red. The arrows indicate in green "upward", in yellow diagonal "taking off", in yellow horizontal "stable", and in red "downward". *Expert estimates for Spain in 2015-16 ranged from 200 to 3000 contracts.

5 Status of business environment: actors and contracts

5.1 Actors providing, facilitating and financing EnPC

Figure 14 represents the expert assessment of the availability and quality of services of provision, facilitation, one-stop-shops and financing at EU and MS levels.

The EU-level averages for sufficiency show that services of provision (availability of EnPC providers) are rated as 1.7 out of 3 (MS Total in **Figure 14**), and that of facilitation is 1.4 out of 3. The best-appreciated availability is that of the financing actors willing to support EnPC, rated 1.6 out of 3. One-stop shops are the actors rated as less sufficiently available, with 0.6 out of 3.³⁷

EnPC providers

EnPC providers are energy service companies or other operators acting as contractors in EnPC agreements. These actors implement energy efficiency or energy saving measures in the premises of a client repaying from the cost savings during the operation phase, which can provide financial guarantees about the savings being enough to cover the upfront costs, to offer compensations agreed in the EnPC contract in case of failure to meet the agreed savings. **Figure 14** allows identifying the largest markets:

- The MSs with the highest provision reported are Belgium, Czech Republic, Romania and Spain (rated above 2.5 out of 3). Moreover, as assessed by experts, the MSs with the best quality providers are Austria, Czech Republic, Denmark, France, Romania, Spain and Germany (all rated above 2.5).
- The MSs with the lowest provision reported are Austria, Croatia, Cyprus, Denmark, Latvia, Lithuania, and Poland.
- The need for improved quality of services was highlighted as a barrier in several MSs, including Italy, Poland, and Lithuania.³⁸

Although in abidance by Art. 18 of the EED, there are lists of ESCOs in most MSs, the information was not always available for the authors, largely for being in national languages. However, the gathered input from experts points at the available lists of providers not differentiating those willing and qualified to conduct EnPCs from other energy service contractors. (This differentiation is not required in Art. 18 of the EED). **A lack of** databases specific to EnPC providers is evidenced in cases such as Italy, where many reported providers do not reflect the market reality. As a result, there appears to be a widespread potential in creating lists of providers available for EnPC, as well as for and for MSs “encouraging the development of quality labels, among other things, by trade associations” and “making publicly available and regularly updating a list of available energy service providers who are qualified and/or certified and their qualifications and/or certifications”.³⁹

EnPC facilitators

Contracting facilitators refers to in this report as the “independent market intermediaries [which are meant] to play a role in stimulating market development on the demand and supply sides” referred to in Article 18 of the EED since 2012. By mediating between EnPC providers and clients, facilitators play a key role in fostering trust in the model. The sufficiency and quality of these services, as assessed by national experts, are represented in **Figure 14**:

- The MSs with the highest availability of facilitators are Croatia, Portugal, Belgium, Bulgaria, Czech Republic and Finland (all rated above 2/3). This is supported by the quality of facilitation services in all of these MSs, except in Italy, where many facilitators could be related to providers (as “sales

³⁷ The average of MS expert ratings is comparable to the one obtained at EU-level. The former, however, is preferred in this discussion for enabling to relate to national assessments.

³⁸ Further attention to this situation in a wider diversity of MSs would require the engagement of more stakeholders, e.g., clients.

³⁹ A review of the quality assurance and certification of services in the EU and recommendations on the matter were formulated by QualitEE Project (2020) with a focus on EnPC amongst other. The Art. 18 refers to Art. 16 of the EED which requires MSs that “Where a Member State considers that the national level of technical competence, objectivity and reliability is insufficient, it shall ensure that, by 31 December 2014, certification and/or accreditation schemes and/or equivalent qualification schemes, including, where necessary, suitable training programmes, become or are available for providers of energy services,” ...in ways that “provide transparency to consumers, are reliable and contribute to national energy efficiency objectives.”

agents”) and hence cannot play the independent role expected from them. Concerns about the specialization of facilitators were also raised in Bulgaria and Romania.

- The greatest concerns about the sufficiency of facilitation were reported in Sweden and France (both rated 0/3), followed by Slovenia, Austria, Denmark, Germany, Hungary, Latvia, Lithuania, and Poland (all rated below 1.1/3).
- There are also cases, such as Spain, where above-average ratings for sufficiency (1.7/3) contrast with the quality of services, which is well below the average of 1.9/3 (1.3/3). Ireland and Italy follow this pattern.

To address sufficiency and quality issues, training and certification of facilitators took place in Ireland in 2022. Regardless of low availability, high quality of facilitation was reported in Slovenia as having been enabled by the support of ELENA projects. Training facilitators appear to have a sizeable potential in several MSs to boost the availability of their services and the capacity of practising facilitators to support contracting processes effectively. There is also the potential to create lists of EnPC facilitators based on training and certification processes.

One-stop-shops

The EPBD refers to one-stop-shops as accessible and transparent advisory tools and assistance instruments for relevant energy efficiency renovations and financing instruments (Recital 16 and Art. 2a, 2018). In Article 18 on Energy Services, the EED also requires MSs to publicize information points for final customers. The one-stop-shop model is largely diverse, encompassing different degrees of provision and facilitation services (See Boza-Kiss and Bertoldi, 2018 for an overview of one-stop-shops in the EU market). It is possible, therefore, that this diverse understanding of the model makes it difficult for experts and reviewers to assess the existence and quality of these services to fulfil the EnPC market needs. This report refers specifically to those one-stop-shops that can provide information and technical support about the usability of EnPC in the legal and financial context of a geographic and sectoral scope of work. The expert assessment collected in **Figure 14** can be summarized as follows:

- The expert participants in the EU Survey assessed most positively the availability of one-stop-shops in Finland, Germany and Italy (all rated 1.5/3).⁴⁰
- One-stop-shops are reported as most insufficiently deployed in Bulgaria, Ireland, Poland, Portugal, Slovenia, Spain, Sweden, and to an extent, Croatia (all rated 0 out of 3, except for Croatia, rated 0.5/3). The development of some of these markets with limited support of one-stop-shops indicates that the latter are not indispensable for EnPC markets to take off and thrive. However, in an increasingly complex legal and financing framework, sectoral actors consider deploying one-stop-shops to have the potential to exploit the market potential for EnPC.
- The quality of services provided by one-stop-shops is generally appreciated in those MSs where they are most available and others where they are considered insufficient (Spain and Sweden), indicating that these services fulfil a much-demanded role in the market. There are sectoral expectations in the newly-established one-stop-shop in Latvia and RRP-related plans to establish one in Bulgaria. An exception is Croatia, where the experts speak both of limited availability and capacity to support EnPC (both rated 0.5/3).
- Overall, there is higher demand than the availability of one-stop-shops. Although there are cases where their quality is highly appreciated, in some cases, there may be a need to ensure that one-stop-shops can support EnPC development.

Financing actors willing to support EnPC

Against expectations based on sectoral claims about the insufficiency of financing for providers recollected in the JRC report of 2021 (Moles-Grueso, et al. 2021), the sufficient availability of financing actors working with EnPC is the highest (1.6/3 at EU level) after providers (1.7/3). This situation reflects the lower cost of financing depicted in Section 3.4 and can reflect the availability of public funding being made available to banks for green investments. However, the data processed does not provide sufficient insight into this matter. On the contrary, the services' quality is generally rated below those of provision and facilitation and is only rated as better than those of one-stop-shops. As in the case of the JRC report of 2021, multiple experts referred to the

⁴⁰ In the Netherlands, where there are province-level one-stop-shops, the quality and sufficiency of their service was not assessed by national experts.

lack of expertise amongst financiers to deal with EnPC, resulting in a magnified risk perception on the part of these financing actors (indicated by experts in Italy, Ireland, and Romania). Some experts clarified when stating the number of financing actors that this figure refers only to those actors willing to provide refinancing. At MS level:

- The availability of actors willing to provide financing support to EnPC was assessed by national experts as highest in Czech Republic and Finland (3/3), followed by Austria, Belgium, Bulgaria, Ireland, Latvia, Lithuania, Slovakia, Spain, and Sweden (all rated 2/3).
- The most wanting supply and quality of financing actors were identified in Italy, Poland and Hungary (all below 0.5), followed by Portugal and Slovenia (1/ 3).

The reviewed evidence points to limitations in training amongst facilitators and financing bodies and the need for increased transparency about the qualification of EnPC providers for their specific roles in the energy service provision domain. In general, the development of one-stop-shop network continues to have an unexplored potential.

Figure 14. Availability, sufficiency and quality of EnPC provision, facilitation, one-stop-shops and financing

MS	EnPC providers			EnPC Facilitators				One-stop-shops (able to support EnPC)				Financing actors willing to support EnPC			
	Number	Sufficiency (0-3)	Quality (0-3)	Number	Sufficiency (0-3)	Quality (0-3)	Commentary	Number	Sufficiency (0-3)	Quality (0-3)	Commentary	Number	Sufficiency (0-3)	Quality (0-3)	Commentary
Austria	15	1.0	3.0	19	1.0	2.0					No impact identified		2.0	2.0	
Belgium	10	2.5	2.5	10	2.5	2.5		3	1.0	2.0		5	2.0	1.5	
Bulgaria	9.5	2.0	2.0	3	2.0	2.0	Mostly energy auditors	0	0.0	0.0		2	2.0	2.0	BEEREF
Croatia	10	1.0	2.0	30	3.0	2.0		0	0.5	0.5		5	1.5	2.0	
Cyprus	4	1.0	2.0	0	0.0			0	0.0			0	0.0		
Czechia	10	3.0	3.0	11	2.0	3.0		-	-	-		3	3.0	3.0	
Denmark	2	1.0	3.0	3	1.0	2.0									Financing available
Finland	24	2.0	2.0	1	2.0	3.0		1	2.0	3.0		10	3.0	2.0	
France	9	2.0	3.0	0	0.0										
Germany	45	1.6	2.6	>100	1.1	1.5		2	1.5	1.7		12	1.3	2.0	Actors doing refinancing
Greece				1	1.0	3.0						0	1.0	0.0	
Hungary	2	1.5	2.5	1	1.0	1.0		0	1.0	1.0		1	0.5	0.5	
Ireland	9	1.5	2.5	3	1.7	1.5	Training in 2022	0	0.0	0.0		4	2.0	1.5	Financing available, limited capacity
Italy	100	2.0	1.5	100	2.0	1.0	Many are sales agents	75	1.5	1.0	Local agencies	5	0.0	0.5	Lack expertise, risk perception
Latvia	4	1.0	2.0	1	1.0	2.0		1	1.0	2.0	Newly established	4	2.0	2.0	
Lithuania	2	1.0	1.0	5	1.0	1.0						1	2.0	2.0	
Netherlands	40			100				12			Province-based	3			
Poland	50	0.0		10	1.0	2.0		2	0.0	1.0		5	0.0	1.0	
Portugal	30	2.0	2.0	5	3.0	2.0		0					1.0	2.0	
Romania	3.5	3.0	3.0	0	0.0	0.0	Mostly energy auditors.	0	0.0	0.0		1	1.0	1.0	Willingness stated, but limited capacity
Slovakia	8	2.0	3.0	5	2.0	3.0		2	-	-	Facilitators. Expected regional offices		2.0	2.0	"several"
Slovenia	8	1.5	2.5	10	0.5	2.0	5 ELENA's	0	0.0	0.0		4	1.0	1.0	
Spain	30	2.7	2.7	20	1.7	1.3		10	0.0	1.5		15	2.0	2.3	Banks and funds
Sweden	5	2.0	2.0	0	0.0			1	0.0	2.0		10	2.0	2.0	
EU estimates	400	2.0	1.5	2000	2.0	1.0		-	1.0	1.0		500	2.5	2.0	
MS Total	430	1.7	2.4	338	1.3	1.9		109	0.6	1.1		90	1.5	1.6	

Source: JRC, based on EU Survey 2022. The values presented are averages of expert ratings. Values in bold indicate large variability between responses. The colour rating indicates the largest magnitudes in green and the smallest magnitudes in red, ranked for the values under each type of actor.

5.2 Understanding and willingness of clients and financiers

The MS-level expert assessment of the capacity to engage with EnPC of clients from the public and private sectors and financiers indicates a potential problem. These three actors were rated by sectoral experts between 1 and 1.5 out of 3 in their understanding and willingness to engage with EnPC, reflecting the model's complexity and a market reality where economic and technical potentials are not exploited (**Figure 15**). Contrary to the assessment of the quality-of-service provision reviewed in Section 5.1, financing actors are (marginally) better rated than clients for their understanding and willingness to engage with EnPC business. Reflecting the reality of the market, the willingness of the public sector is slightly above that of the private sector. However, there are claims such as those of participant EU-level experts which invoke the awareness of the private sector about energy costs, the importance of ESG, the value of the building stock of corporations, and interest in outsourcing activities outside the companies' expertise to explain the private commercial sector's willingness to engage with EnPC. These aspects appear to be gaining relevance in determining the development of the private market.

The assessment of the public, private sector and financing actors' understanding of the MSs indicates that:

- Public sector understanding is most appreciated in Austria,⁴¹ Belgium, Czech Republic, Germany, Poland, Slovakia and Slovenia (rating above 1.9/3)⁴² and worst valued in Lithuania, Portugal, Romania and Hungary (rating below 0.5/3). Moreover, there are 11 MSs where the public sector's understanding scores as moderate (rating below 1/3).
- Private sector understanding is most appreciated in Netherlands and Poland (above 2/3) and is worst valued in Lithuania, Hungary and Bulgaria (rating below 0.5/3).⁴³ There are 12 more MSs where the private sector scores moderate in terms of understanding.
- Financing sector understanding scores best in Czech Republic, Denmark, and the Netherlands (rated 3/3), followed by (Belgium, Finland, Lithuania, and Romania (rated 2/3) and is worst rated in Italy, Sweden, Slovenia, Bulgaria, and Ireland (all of them rated below 0.7/3).⁴⁴

Even in developed markets with lots of experience in the use of EnPC, such as Germany, information is considered to continue to be necessary for clients to become familiar and willing to engage with EnPC. Experts' opinions indicate a potential for information and training throughout these three sectors to exploit the potential of EnPC.

There is some correlation between willingness to engage with EnPC and understanding of the model. However, there are interesting differences between both indicators:

- Public sector willingness to engage with EnPC is highest in Belgium, France, Italy, Poland, Slovakia and Slovenia (above 2/3). Poland, Slovenia, Slovakia and Belgium also score high in understanding the model. In Germany, the willingness of the public sector is highly variable, with the Federal Real Estate company being committed to EnPC for energy management of buildings but not for deep renovations and diverse approaches being chosen by federal states. There are cases where the public sector is not interested in EnPC due to dependency and availability of grants. There are also cases of different levels of willingness related to different types of projects. In Spain, the willingness to engage with EnPC to renovate public buildings is much lower than for street lighting (The latter also counts with better support from the financing sector.)
- The worst level of public sector willingness was assessed in Lithuania and Romania (rated 0/3), which also score badly in the understanding of the model; moreover, there are 11 MSs more where the public sector's willingness to engage with EnPC is rated as moderate (ratings below 1/3).
- Private sector willingness is most appreciated in Belgium, Denmark, Poland, Slovakia, and Spain (above 2/3). The Polish private sector also scores high in understanding, reflecting an interest in the industry.

⁴¹ The Federal Real estate company is committed to EnPC for energy management of buildings but not for retrofits. Diverse approaches in federal states.

⁴² However, this often refers to local governments whose interest is not matched by that of central governments (e.g., Poland).

⁴³ In Bulgaria, lack of clients' willingness is related to grant-dependency

⁴⁴ In Italy, the financing sector is still highly aware of risks associated to EnPC, in part due to need for clarity of the model.

- Private sector willingness is worst valued in Czech Republic, Lithuania, and Bulgaria (ratings below 0.5/3). The latter two also score badly in understanding. There are 12 more MSs where the private sector's willingness to operate with EnPC was rated moderate.
- The willingness to support EnPC in the financing sector largely correlates with the level of understanding. In the Netherlands, Slovenia, and Sweden, major differences between both indicators potentially indicate the need for information and training in the former two and adverse market conditions in the latter. In Italy, the financing sector is still highly aware of the risks associated with EnPC. This has been attributed to the continued lack of clarity in the model.

The overall correlation between willingness and understanding calls for efforts of awareness raising, information and training. Differences between willingness and understanding potentially indicate the existence of other barriers besides knowledge and technical capacity in several MSs. Such is the case of grant dependency in Bulgaria. Lack of willingness is related in the Netherlands and Germany to the need for information but most fundamentally to providers' efforts to adapt their services to clients' needs. Also, willingness can be very diverse depending on the type of intervention. For instance, willingness related to buildings is much lower than for street lighting in Spain's public and financing sectors. Calls for attention towards awareness and information include concerns raised at the EU level that EnPC is often understood as a financing mechanism and not a way to achieve energy savings over the project's lifetime, especially in the public sector. This motivation, the expert continued, results in frustration about the administrative and technical burden leading towards the contract agreement.

Figure 15. Understanding of EnPC and willingness to operate with EnPC of clients (public and private) and financing actors.

MS	Understanding			Willingness		
	Public	Private	Financing	Public	Private	Financing
Austria	2.5	1.0	1.0	1.5	1.0	1.0
Belgium	2.0	1.5	2.0	2.5	2.0	3.0
Bulgaria	1.5	0.5	0.5	1.0	0.5	0.5
Croatia	1.0	1.0	1.0	1.0	1.0	1.5
Cyprus	1.0	1.0	1.0	2.0	1.0	1.0
Czechia	2.0	1.0	3.0	1.0	0.0	3.0
Denmark	1.0	1.0	3.0	1.0	2.0	3.0
Estonia						
Finland	1.0	1.0	2.0	1.0	1.0	2.0
France	1.0	1.0	1.0	2.0	1.0	1.0
Germany	1.9	1.5	1.6	1.6	1.3	1.5
Greece	1.0	1.0	0.0	1.0	2.0	0.0
Hungary	0.5	0.5	0.5	1.5	1.5	1.5
Ireland	1.0	1.0	0.7	1.0	1.3	1.3
Italy	1.0	1.5	0.0	2.0	1.0	0.0
Latvia	1.0	1.0	1.5	1.0	1.0	1.5
Lithuania	0.0	0.0	2.0	0.0	0.0	2.0
Luxemburg						
Malta						
Netherlands	1.0	2.0	3.0	1.0	1.0	2.0
Poland	2.0	2.0	1.0	2.0	2.0	1.0
Portugal	0.0	1.0	1.0	1.0	1.0	1.0
Romania	0.0	1.0	2.0	0.0	1.0	2.0
Slovakia	2.0	2.0		2.0	1.0	
Slovenia	2.0	1.5	0.5	2.5	1.5	1.5
Spain	1.3	1.4	1.5	1.0	2.0	1.7
Sweden	1.0	1.0	0.0	1.0	1.0	1.0
EU estimates	1.3	1.7	1.3	0.7	1.7	1.3
MS avg	1.2	1.1	1.3	1.3	1.2	1.5

Source: JRC based on EU Survey 2022. Response of experts to: "Please rate the understanding of the workings of EnPC and the willingness to use EnPC of potential clients in the public and private sectors and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good)." The colour code indicates "absent" in red and "very good" in dark green, ranked for each indicator, i.e., understanding and willingness.

5.3 Contract modalities

This section covers the types of EnPC contracts used and the alternative contracts used in the MSs. The EU Survey 2022 asked participants to rate the relevance in their markets of expertise of EnPC with guaranteed savings and with shared savings alongside other contract modalities from “not in use” (0) to “very common” (3).⁴⁵ **Figure 16** summarizes the ratings obtained for guaranteed and shared savings in the public and private sectors of MSs and the EU. The survey also asked participants to indicate whether any of the contract modalities indicated compete with EnPC (**Table 2**).

Generally, the guaranteed savings model is favourable to the client when it can get more favourable financing on its own or fees are paid from public funds, e.g. in France. On the contrary, it is beneficial for the client to get financing through the EnPC provider (shared savings model) in cases such as Bulgaria, Portugal, Spain, and Italy. Shared savings and the combination of guaranteed and shared saving options, as in the cases of Ireland and Czech Republic, is interesting to incentivise the achievement of energy savings by avoiding overly conservative estimates and fostering efforts of both parties during the contract duration, e.g. in maintenance.

Analysis of **Figure 16** shows the extent to which these two EnPC modalities are – according to consulted experts – common in the public and private sectors of the MSs and the EU (as opposed to other contracting options for energy efficiency projects). EnPC with guaranteed savings is relatively more common in the public sector markets of the EU than in private markets. Shared savings are equally relevant (relatively uncommon) in both sectors. In the private market, shared and guaranteed savings are of similar relevance (relatively uncommon)

- Guaranteed savings is the favoured EnPC modality in the public and private sectors of Belgium, Finland, Greece, and Poland. Also, it is equally important in both sectors in Italy and Spain. In these two MSs, however, shared savings is reviewed as relatively more common than guaranteed savings.
- Guaranteed savings is most common in Austria, Denmark, France, Germany, Italy, Slovenia, and Slovakia (in Slovakia, shared savings is also common in the public sector). Guaranteed savings is also relatively more common in the public than the private sectors of Croatia and Ireland. Guaranteed savings is the model used in the developed Croatian market for public lighting. In Czech Republic and Ireland, a model combining guaranteed and premium shared savings is the most common contracting model in the public sector.
- Guaranteed savings is relatively common in the private sector of Portugal and Sweden, where the model is not in use and uncommon – respectively – in the public sector.
- Shared savings is preferred over guaranteed savings in both the public and private sectors of Italy, Portugal and Spain and shares the market with guaranteed savings in Slovakia. It is also the favoured model by the public sector in Portugal.
- Shared savings is the preferred EnPC model in Bulgaria's public sector and France's private sector.

As for the public sector:

- The public sectors of 11 MSs favour guaranteed savings over shared savings, i.e., Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Poland, Slovakia and Slovenia.
- Both modalities are relatively common in 2 MSs, the public sectors, i.e., Czech Republic and Ireland, where both models are combined.
- Shared savings prevail in the public sectors of 3 MSs, i.e., Bulgaria, Italy, and Spain. In the latter two, the difference between both models could be considered marginal.

Regarding the private sector:

- The private sectors of 4 MSs favour shared savings over guaranteed savings, i.e., Bulgaria, France, and to an extent. Italy and Spain.

⁴⁵ The characteristics of both EnPC modalities are summarized in **Box 2** (Introduction).

- The private sectors of 4Ms favour guaranteed savings over shared savings, i.e., Belgium, Finland, Greece, Latvia, and Poland.
- The private sectors of 2 MSs favour both modalities, i.e., Portugal and Sweden (combination of models). In various MSs' private sectors, both modalities are equally uncommon (Austria, Croatia, Czech Republic, Germany, Ireland). Moreover, shared savings is uncommon in Hungary, Cyprus, and Slovakia, whilst guaranteed savings are not in use.

Figure 16. Relevance of EnPC with guaranteed savings and with shared savings in the market.

MS	Guaranteed savings			Shared savings			Commentary
	Public	Private	Overall	Public	Private	Overall	
Austria	3.0	1.0	2.0	1.0	1.0	1.0	The public sector must be financed via the provider
Belgium	3.0	3.0	3.0	0.0	1.0	0.5	
Bulgaria	0.0	0.5	0.0	2.5	1.5	1.0	Clients expect the ESCO to provide financing
Croatia	1.5	1.0	1.0	1.0	1.0	1.0	
Cyprus	0.0	0.0	0.0	1.0	1.0	1.0	
Czech R.	3.0*	1.0	2.0	3.0*	1.0	2.0	Guaranteed savings and shared "extra savings"
Denmark	3.0	1.0	2.0	0.0	0.0	0.0	
Estonia	0.0	0.0	0.0	0.0	0.0	0.0	
Finland	2.0	2.0	2.0	1.0	1.0	1.0	
France	2.0	0.0	1.0	0.0*	3.0	1.5	*Third-party financing recently possible
Germany	1.7	1.0	1.5	1.0	1.0	1.0	Guaranteed savings in municipalities and industry
Greece	2.0	2.0	2.0	0.0	1.0	0.5	
Hungary	0.0	0.0	0.0	0.0	1.0	0.5	
Ireland	1.5*	1.0	1.3	1.5*	1.0	1.3	Blend of guaranteed and shared savings models
Italy	2.0	2.0	2.0	2.5	2.5	2.5	
Latvia	0.0	0.5	0.5	0.0	0.0	0.0	
Lithuania	1.0	0.0	1.0	0.0	0.0	0.0	
Luxemburg	nd	nd	nd	nd	nd	nd	
Malta	0.0	0.0	0.0	0.0	0.0	0.0	
Netherlands	nd	nd	1.0	nd	nd	1.0	
Poland	2.0	2.0	2.0	1.0	1.0	1.0	Facilitators promote a shared savings model
Portugal	0.0	2.0	1.0	2.0	2.0	2.0	
Romania	0.0	0.0	0.0	0.0	0.0	0.0	
Slovakia	3.0	0.0	3.0	2.0	1.0	2.0	Some shared savings contracts in private commercial buildings
Slovenia	2.5	1.0	1.8	1.5	1.5	1.5	
Spain	2.0	2.0	2.0	2.3	2.3	2.3	Guaranteed savings is common in residential
Sweden	1.0	2.0	1.5	1.0	2.0	1.5	
EU Estimates	1.5	1.0	1.7	1.0	1.0	1.0	
MS Average	1.4	1.0	1.3	1.0	1.1	1.0	

Source: JRC based on EU Survey 2022. Responses to "Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common)". The colour code indicates the largest magnitudes in green and the smallest in red, ranked for the overall set of values. Nd stands for no data available.

An overview of the competing contract modalities in the MSs (**Table 2**) shows that EnPC still competes with “simpler models” with lesser guarantees, i.e., with technical guarantees but without M&V of savings, as reported in Austria, Bulgaria, Denmark, Estonia, Hungary, Latvia, Lithuania, Netherlands.⁴⁶ There are also cases where the reason for less complex models responds to clients' will to keep control of the building management, in the case of Sweden, and where facility management is considered too risky for the provider in Czech Republic. In the former case, it results in limited adoption of EnPC, and in the latter case, it results in a peculiar model. Facility management is also a widespread contract and can be a barrier to adopting EnPC in buildings where the established contracting model and relationship with providers make it difficult to transition to a new model.

One risk of simpler contract modalities is that these also tend to focus on a specific technology. They attain simplicity by focusing on partial interventions. This is often the case of public interventions that opt out of using EnPC in the Netherlands. In particular, there is a rising interest in contracts of Energy efficiency as a Service (EEaaS) in the private sector because this model is less complex than EnPC and can be off-balance in IFRS rules. On the contrary, consideration of leasing models as on-balance is an advantage for private actors to prefer EnPC. The advantage of EEaaS is its simplicity, for relying on technical guarantees (**Figure 17**). A noticeable increase in the interest for on-site renewable generation can also be considered a barrier for EnPC for its suitability for contracts with technical guarantees and when renewables are included in contracts pursuing EnPC compliant with Eurostat guidelines – where the percentage of savings from renewables is limited.

However, the arrangement that most compete with EnPC – and which can be disadvantageous for not involving ESCO expertise and any guarantees – is direct implementation with the support of grants, often originated from Cohesion Funds or the Recovery and Resilience Facility, as in the cases of Croatia, Cyprus, Bulgaria, Poland, Romania. Direct contracting of works, BOOT, and Energy management are most common and compete with EnPC in Czech Republic, France, Germany and Spain.

On the other end of the trends, there is also a drive for addressing life-cycle costs and impacts of the building and integrating a decarbonisation perspective, as noted in Belgium, Sweden, and Germany, alongside interest for renewable integration in interventions, e.g., Bulgaria, France, Croatia, Cyprus, Greece, Italy, and Spain. Given the limitations of the EnPC in addressing deep renovations of buildings, developments are expected, either by incorporating more benefits than savings, hence making models more complex but reducing return periods. Alternatively, there is a need for a clear separation of the EnPC intervention from other interventions in buildings, e.g. supported largely by subsidies or other financing instruments. Especially in the latter case, the prevalence of EnPC concerning contracts with technical guarantees needs to be reassured to clients and financiers.

⁴⁶ These alternative contracting modalities include LaaS, Technical consultancy and guarantees, variants of ESCO contracts without guarantees, Installation of renewables with technical guarantees, Energy efficiency contracts

Figure 17. Energy as a Service contracting as an alternative to EnPC.

Business model type	EnPC		Energy Service Contracting (or EaaS)
	Guaranteed savings model	EnPC – Shared savings model	
Definition	Implementation of energy saving measures with ongoing monitoring and verification services to provide guaranteed energy savings.	Implementation of energy saving measures (mainly demand side) to provide cost savings associated with the overall energy/utility bill.	Efficient supply of useful physical outputs such as heat, steam or light is contracted, measured and delivered in physical units.
Types of technologies	Simple and complex measures	Simple and complex measures	Single measures
Fee structure	Payment derived from the energy savings achieved in constant prices of the base year.	Payment linked to the achieved change in energy consumption.	Payment of a fixed rate/tariff, normally without energy performance requirements.
Accounting approach	On-balance	On-balance / Off-Balance	On-balance / Off-balance
Type of financing and who is accessing it			

Source: Alexandra Hedesiu. *Energy-as-a-Service Contract: key differences and Benefits. In EaaS vs EPC: How contract modelling can impact your sales strategy*, 19 May 2021. Launch.

Table 2. Models competing with EnPC in the MS.

MS	Competing models
Austria	Several alternative contract modalities in private clients, ESCO without guarantees
Belgium	Innovative models of Building Performance Contracting for deeper renovation
Bulgaria	Grants which are not blended with EnPC; Installation of renewables with technical guarantees
Croatia	Grants are the main competitor
Cyprus	Direct contracting, supported by grants
Czech R.	BOOT and Facility management...
Denmark	Technical consultancy and guarantees
Estonia	Lighting as a Service
Finland	Contract energy management in the real estate market and facility management in the industrial sector.
France	Building works contracts and Contracts Energy Management
Germany	Direct contracting, BOOT, Energy Management
Greece	Grants
Hungary	BOOT and Energy efficiency contracts
Ireland	No
Italy	No
Latvia	Lighting as a Service
Lithuania	EnPC, Energy efficiency improvement contracts, PPPs (Public)
Luxemburg	
Malta	
Netherlands	Simpler contracts, partial solutions
Poland	EnPC and PPP are complementary options. Grants, direct implementation
Portugal	EnPC in the private sector tend to be hybrid
Romania	Grants, direct implementation
Slovakia	
Slovenia	
Spain	Public sector: BOOT and Chauffage;
Sweden	Major differences in the capacity of decision-making of building users
EU	Investment grants that cannot be combined with any third-party investment; rising EEaS

Source: JRC based on EU Survey 2022. Response to the question: "Would you say that any of these mechanisms compete directly with EnPC for certain markets? Please specify which ones."

6 Project characteristics

This section reviews the project typologies according to a) a series of metrics, i.e. size, duration, payback, and percentage of baseline energy savings; b) the areas of project intervention, mainly buildings (whether in the public or private sector), lighting of public space (public lighting), industry, and DHC), and c) the types of interventions in buildings (deep renovation, replacement of specific technologies, installation of on-site renewables, installation of building or plan control and demand flexibility or energy storage).

6.1 Size, duration, payback and savings

The summary of the project metrics, presented in **Figure 18**, shows that the largest project sizes were reported in France, Denmark, Belgium, Greece, Slovenia, and the Portuguese private sector, all of which report typical projects above €3m. These are largely related to large buildings, e.g., hospitals or project aggregates. As a Belgian expert indicated, promoters promote increasing project thresholds for contracts and tendering to be profitable. In public lighting, smaller contracts continue to be common, as in the case of Croatia, where public lighting contracts round €1m. Accordingly, large contract sizes can indicate a competitive market with high transaction costs.

As in the case of the JRC report 2021, in several MSs, there is a gap between the size of public and private projects. Such is the case of projects in buildings in Austria, Czech Republic, Italy, Poland, and Slovenia. Also, public lighting projects in Croatia are larger than contracts in the private sector (buildings). There are several MSs where contracts in the private sector are achieving the same scale as the public sector or even surpassing it. The former involves Belgium and Finland, and the latter involves Denmark, Ireland, and Portugal. In Portugal's case, this comparison involves private commercial buildings and industry as opposed to public lighting projects.

Project duration depends both on the type of intervention and the financing availability. For instance, the limited availability of long-term financing can be a barrier to addressing deep renovations, which have long return periods, through EnPC. Another major factor is energy prices. Their recent general increase contributes to reducing the payback of EnPC. Similarly, MSs with lower energy prices have longer paybacks and hence more difficulties in financing EnPCs, especially those involving deep interventions. The longest paybacks, above 12 years, are common, especially in the public buildings of 8 MSs, i.e. Denmark (20 years), Slovakia (20 years), Poland (17 years), Slovenia (16 years), Czech Republic (16 years, when subventions are available), Germany (12 years or 15 years when envelope is included), the Netherlands (12 years) and Lithuania (20 years). These are largely the result of the combined effect of deep interventions with supporting subventions. Long-term renovations are, at times, tied to the residential function. The latter is the case of private residential buildings in Latvia (12 years) and public residential buildings in Lithuania (25 years), where residents are allowed slow repayment, and the condition of the buildings require deep interventions. Moreover, low energy prices work against quick investment returns, most fundamentally in Lithuania.

Different savings over the baseline consumption are closely related to the type and area of intervention.

- Interventions in buildings typically result in savings of around 25-30% of the baseline and higher values are achieved when the EnPC is combined with additional funding. Examples of the former situation are the building renovations in Belgium, Austria, and Ireland and renovations of public buildings in Italy. A case of higher savings is Poland, where public sector interventions are reported to attain 50% of savings with a payback of 17 years, hinting at the existence of deep renovations, which, however, were not reported.⁴⁷
- Public sector contracts involving interventions on public lighting achieve the largest savings (reported as 85% in Croatia and 70% in Spain and Portugal).
- Reportedly, a high potential in the industrial sector (e.g. Poland with 80% savings) needs to be regarded with caution because contracts tend to focus on replacing or adjusting productive elements, replacing lighting, and installing renewables.

⁴⁷ This is probably due to the availability of data on the overall savings achieved in building renovations whilst acknowledging that interventions in the envelope are addressed through other contracting modalities.

Regarding building renovations, the focus of EnPC on shallow renovations, which attain around 25 to 30% of savings, is due to the avoidance of long paybacks. Achieving further savings in buildings is a challenge for the EnPC model in a context shaped by to pressing targets of decarbonization, energy efficiency and building energy performance. For instance, in France, where EnPC in public buildings is achieving 30%, commercial building interventions are planned to pursue 40% savings soon.

A final remark refers to data availability. The data obtained for achieved savings of EnPC projects is more variable than other metrics. There is a need to consolidate databases of interventions with real savings to understand market developments and inform the introduction of mechanisms that guarantee EnPC or complement its interventions.

Figure 18. Typical size, duration, payback and percentage of baseline consumption in MSs.

MS	Project size (m€)			Duration (Years)			Payback (Years)			Commentary	% of baseline consumption			Commentary
	Public	Private	Overall	Public	Private	Overall	Public	Private	Overall		Public	Private	Overall	
Austria	0.9	0.6		10	6		10	6			25	35		
Belgium	2.2	2.2		10	10	10	10			Size of €1.5-3m depending on client financing	30	30		Data on interventions without envelope
Bulgaria	0.4			7		8	7				30			
Croatia	1.0	0.4		10	7	10	10	7			85			Public projects are lighting
Cyprus		0.3								No projects in the public sector				
Czech Repub	1.8	0.6		10	5		9	9		Projects up to €10m and 14-18 years	30	30		
Denmark	7.0	1.5		5	2		20	8			20	25		
Estonia	1.0	0.0		5						Effect4buildings projects (H2020)	0			
Finland	0.5	0.6		15	8		10	5			10	15		
France	10.0	10.0		10	10		8	8			30			Tertiary required to reach 40%
Germany	2.0	0.8		13	7	10	12	5		Existence of deep renovations in the public sector (>15years)	47	55		Public: 28-65%, Overall 50-60
Greece	3.6	0.6					9			Duration variable in public sector (6-25 years)	6			
Hungary			0.4			10		9			67		23	Efficiency and renewables, public lighting
Ireland	2.5	1.0		9	5		8	4		Public contracts of €0.5m or €5-10m	35	25		
Italy	1.0	0.2		10	8		8	5			30	15	25	
Latvia	0.0	0.3			20			12		Residential		48		Residential
Lithuania	0.7			17			25			Duration related to low energy prices, and condition of residential buildings	35			
Luxemburg										Probably no projects				
Malta										No projects				
Netherlands	1.2	1.2		12	12		12	12						No data available
Poland	1.0	0.3		12	5		17				50	80		Private data: RES and industrial
Portugal	5.0	3.0		11	6		7	4			70	30		Public data refers to lighting
Romania										Unknown, no projects				
Slovakia	0.5	nd		10			20			No recent data reported. Rough estimates	20			
Slovenia	3.0	0.5		15	8	14	16	8		Easy Repayment Period (up to 20 years)	43	40	35	
Spain	1.5	1.0		12	9		7	5			70		37	Public data refers lighting
Sweden			0.5			3		7					17	
EU	2.0	1.0		7	5	8	5	4		Prior to energy price rises	20	30	25	
EU avg	2.2	1.3		11	8	9	12	7			37	36	27	

Source : JRC based on EU Survey 2022. The colour code indicates the largest magnitudes in green and the smallest in red. The colour code is based on a comparative analysis conducted for each category (i.e., public, private and overall) within each metric (i.e. project size, duration, payback and % of baseline) to compare MSs. Values in bold indicate highly variable estimates. The overall estimate was only requested from respondents whenever they could not provide data specific to the sectors.

6.2 Intervention areas

An analysis of the relevance of the different project areas as assessed by national experts (**Figure 19**) shows that public buildings, followed by public lighting (rated 1.8/3 and 1.5/3, respectively) continue to be the most frequent type of projects in the EU, followed by privately owned, mainly commercial, buildings, and closely followed by interventions in the industry (rated 1.2/3).

- Public sector interventions largely prioritize buildings over lighting in Belgium, Czech Republic, Denmark, Finland, Ireland, and the Netherlands. Public sector interventions focus on public lighting in Croatia and Portugal. Public lighting is also more important than interventions in public buildings in Spain, Greece and Italy. This is the path expected to be followed by Cyprus.
- Interventions in private buildings, mainly commercial buildings, are most relevant in Belgium, Finland, France, and Poland (all rated above 2/3), generally following public buildings closely.
- Interventions in residential buildings are of relative importance in Spain, Sweden, Germany, and France, and the main type of intervention in Lithuania and Latvia. In France, the private buildings renovated using EnPC include an important portion of the social housing sector. Other MSs where interventions in private buildings include residential buildings are Spain, Sweden, Germany, and Latvia. Social housing is fundamental in the Lithuanian market.
- EnPC interventions in the industry are mostly dissociated from productive processes involving photovoltaic generation, lighting, and cogeneration. Interventions in the industry are most relevant in Croatia, Finland, Ireland, Italy, Poland, Portugal, Sweden, Spain, and Slovenia. In Cyprus, the only contract found as EnPC involves the installation of renewables in industrial premises.
- District heating and smart grids are relatively low in relevance at the EU level (rated 0.6/3 and 0.3/3, respectively) but relevant in some national markets. District heating is relevant for EnPC in Austria, the Netherlands (rated 2/3), Belgium, Croatia, Germany, Hungary, Slovenia, and Sweden (rated above 0.8/3). Smart grids have been reported to be of relative relevance in the Netherlands, Denmark, Hungary (all rated 1/3), Croatia and Slovenia (both rated 0.5/3).⁴⁸

Project aggregations, pools and bundles refer to contracts that address interventions in different areas. These belong to the same client in the case of pools or bundles and to different (public sector) clients in the case of aggregations. These processes may also involve different interventions, e.g. public sector lighting and buildings or a relatively homogeneous set of project areas (e.g. schools). Bundles or project pools are most reported as common intervention areas in Austria, Belgium, Czech Republic, France, Germany, Italy, and Spain (all rated above 2/3). In Italy, project bundling has been related to requirements of national subventions (Superbonus), but the effects of this policy on the use of EnPC are uncertain.⁴⁹ District heating and e-mobility are potentially rising elements of these bundles, as reported in Finland and Slovenia.

6.3 Types of interventions in buildings

A review of the most common types of interventions in buildings (**Figure 20**) shows that replacement of specific elements is by large the most common intervention both in public and private buildings (the average ratings of MS experts indicate, respectively, a rating of 1.9 and 2.0 out of 3) and that on-site renewable generation is gaining momentum, especially in private buildings (1.6 and 2.0 out of 3 for public and private buildings, respectively).⁵⁰

⁴⁸ in Hungary, it is uncertain to what extent the consulted experts referred to expected or actual relevance of the type of intervention. Documental sources indicate absence of EnPC activity.

⁴⁹ The relevance of project pools or bundles is probably higher than reported because it seems some respondents consider only the combination of different types of projects e.g., buildings and district heating or public buildings of diverse uses, whilst others accept as bundling the combination of relatively homogeneous interventions.

⁵⁰ This difference between public and private interest in renewables as a part of EnPC could result from restrictions in the weight of generation allowed for off-balance EnPC contracts.

Maintenance is also an element of EnPCs (fundamental in Belgium, France, Germany, Hungary, Ireland, Romania and Spain), as it is becoming the integration of building management systems (Belgium, Czech Republic, Ireland, Slovenia, and Spain).

Deep renovations are of the most relevance relative to other interventions in 6 MSs, i.e. Bulgaria (public buildings), Czech Republic (public buildings), Italy (more in private than public buildings), the Netherlands (both public and private), Romania (market expectations for the private sector based on the use of alternative model contracts), Slovenia (public buildings). Overall, this type of intervention scores as “common” in either public or private sectors of 13 MSs (rated as 2 out of 3).

EnPC interventions of demand flexibility and storage have been reported to have some relevance in several MS, especially in Ireland and Italy (ratings of 3/3 in the private and public sectors, respectively) and, to an extent, in Lithuania (2/3 in the public sector). Expectations for developments in this area were expressed for Denmark and Bulgaria, and it is expected to gain relevance for the large industry of the EU.

Figure 19. Project areas prioritized in each MS

MS	Publicly owned buildings	Privately owned buildings	Public lighting (street and tra	District heating/cooling	Smart grids	Project pools/ Bundles	Industry
Austria	2.0	1.0	2.0	2.0	1.0	2.0	1.0
Belgium	3.0 Local authorities	2.0	1.0	1.0	0.0	2.0	0.0 EE aversion
Bulgaria	3.0	1.0	2.5	2.5	0.0	0.0	1.0 Lighting; cooling,
Croatia	0.5	0.5	2.5	1.0	0.5	0.0	2.0 Photovoltaic
Cyprus	0.0	0.0	1.0	1.0	0.0	0.0	1.0 Photovoltaic
Czechia	3.0 Education, health, Municipalities, education, health	1.0 Rarely, offices	1.0	0.0	0.0	3.0	1.0
Denmark	2.0	1.0 Shopping Centers	0.0	0.0	1.0	0.0	1.0 Food industry, Pharma
Estonia	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Finland	2.0	2.0 Probably BOOT	0.0	1.0	0.0	1.0	Buildings &DH
France	3.0	2.0 Social housing	2.5	0.5	0.0	2.0	Public
Germany	2.3 Non-residential	1.3 Residential	1.8	0.8	0.5	2.0	1.0 Generation, not for processes
Greece	2.0	1.0	3.0	3.0	0.0	0.0	1.3 Cogeneration
Hungary	2.0	1.5	2.0	0.0	1.0	0.0	0.0
Ireland	2.7 Local, hospitals	1.0 Warehouses	0.0	1.0	0.0	0.5	Dublin
Italy	2.5	1.0	3.0	1.0	1.0	2.5	Superbonus 110%
Latvia	0.0	2.0 Multi-family	0.0	0.0	0.0	0.0	2.0 Cogeneration, lighting,
Lithuania	2.0 Social housing	0.0	2.0	0.0	0.0	0.0	0.0
Luxemburg							
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	1.0	1.0	0.0	2.0	1.0	0.0	0.0
Poland	2.0 Schools, hospitals,	2.0 Includes industrial	2.0	0.5	0.0	1.0	Planned
Portugal	0.0	1.0	2.0	0.0	0.0	0.0	2.0 Generation, engines
Romania	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Slovakia	2.0	1.0	2.0	2.0	0.0	0.0	
Slovenia	3.0 Education, health, sport	0.0	2.5	1.0	0.5	1.0	ESC+EE
Spain	1.8	1.8	2.5	0.8	0.3	2.0	Private
Sweden	1.0	1.0	1.0	1.0	0.0	0.0	Uncertain
EU est.	1.0 Education, health, sport	0.7 Mostly commercial	2.0	0.7	1.0	0.3	ESC+EE
MS avg	1.7	1.0	1.4	0.6	0.3	0.8	1.1

Source: JRC based on EU Survey 2022. The colour code indicates the largest magnitudes in green and the smallest in red. The magnitudes are based on the averages of ratings granted by experts based on their responses to the question: Please rate the sites (areas) of interventions as 3= most common, 2= common, 1= less common, or 0= not addressed through EnPC. The colour grading was assigned on a country basis to compare the relative relevance of different areas of intervention between MSs visually.

Figure 20. Types of Interventions in buildings

MS	Replacement of specific elements		Maintenance		Deep renovations		Building or plan control		On-site renewable generation		Demand flexibility/energy storage		Notes
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	
Austria	3.0		2.0		1.0		2.0		1.0		1.0		
Belgium	3.0	3.0	3.0	3.0	2.0	0.0	3.0	1.0	2.0	2.0	1.0	1.0	
Bulgaria	2.0	2.0	0.5	1.0	2.5	1.0	1.0	1.0	1.0	3.0	0.5	0.0	
Croatia	1.0	2.5	1.0	1.0	0.5	0.5	0.0	1.0	2.0	2.5	0.5	0.5	
Cyprus	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	
Czech R.	3.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	
Denmark			2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	0.0	0.0	Reflects expectations
Estonia					1.0								
Finland	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	1.0	1.0	
France	2.0	3.0	3.0	3.0	2.0	1.0	0.5	0.0	1.5	2.0	1.0	1.0	
Germany	2.5	2.0	2.5	1.0	1.3	1.0	2.0	1.5	1.8	1.0	1.5	1.0	
Greece	3.0	3.0			2.0				3.0	3.0			
Hungary	2.5	2.5	2.0	3.0	1.5	2.0	0.5	1.0	2.5	2.5	0.0	0.0	
Ireland	2.7	3.0	2.7	3.0	1.5	2.0	2.5	2.0	2.3	3.0	1.0	3.0	
Italy	2.0	2.0	2.0	1.0	2.0	2.5	2.0	1.0	3.0	3.0	3.0	1.5	
Latvia	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	0.0	0.0	
Lithuania	2.0		1.0		2.0		2.0		2.0		2.0		
Luxemburg													
Malta													
Netherlands	1.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	
Poland	1.0	1.0	0.0	1.0	0.0	0.0	2.0	1.0	1.0	2.0	0.0	1.0	
Portugal	0.0	2.0	0.0	2.0	0.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	
Romania		3.0		3.0		3.0							Other contracts
Slovakia													
Slovenia	0.5	0.5	1.5	0.5	3.0	1.0	2.5	1.5	2.5	2.5	1.0	1.5	
Spain	2.0	2.0	2.7	2.5	1.3	1.0	1.7	2.0	2.0	2.0	0.3	1.0	
Sweden	1.0		2.0		1.0		2.0		1.0		1.0		
EU est.	1.7	1.7	0.7	0.7	1.3	1.0	0.7	1.3	1.0	1.7	0.7	0.7	
MS avg	1.9	2.1	1.6	1.7	1.5	1.3	1.6	1.3	1.7	2.1	0.8	0.8	

Source: JRC based on EU Survey 2022. The colour code indicates the largest magnitudes in green and the smallest in red. The magnitudes are based on the averages of ratings granted by experts based on their responses to the question: Please rate the sites (areas) of interventions as 3= most common, 2= common, 1= less common, or 0= not addressed through EnPC. The colour grading was assigned on a country basis to compare the relative relevance of the areas of intervention between MSs visually.

6.4 Trends: types of projects and areas of intervention

A review of the expert commentary in the EU Survey 2022 on the types of EnPC projects, summarized in **Table 3**, indicates a trend in developed markets towards integrating renewables (reported in Austria, Croatia – in combination with public lighting-, Finland, Ireland, Italy, Latvia) and more deep renovations, largely driven by EU and national regulatory framework but also by the ESG commitments of clients (Czech Republic, Germany, France, Ireland, Italy).

A set of new possibilities are open by heat pumps, storage and flexibility, DHC, building management systems, an increased number of private projects, the inclusion of other public buildings than municipal ones, and the need to combine subsidies with EnPC financing, as discussed by a diversity of MS experts.

Insights about the future of EnPC refer to the need for contracts to adapt to clients' needs related to deep renovations. This is a difficult area for development because, at the same time, standardized model contracts are needed to reduce transaction costs and enable project aggregation. Ensuring alignment with the Energy First Principle, decarbonisation targets, and social drive appears to be challenging in times of technological opportunities that create new low-lying fruits, e.g., integrating renewables and building management systems. Because EnPC models are meant to be profitable for providers and clients, it is key to ensure that public support and other policy instruments (e.g. valuing and incentivising deep decarbonisation) foster energy efficiency interventions, including those on the envelope to avoid locking in their potential.

Table 3. Trends for the period 2022-24 regarding types and areas of intervention

MS	Trends
Austria	Integration of renewables and deep renovations in buildings
Belgium	Model expansion beyond municipalities to other public buildings and energy communities
Bulgaria	Market development is expected as far as subsidies get aligned, especially for public buildings
Croatia	Combination of renewables with public lighting (new contract model)
Cyprus	Public lighting expected to take off, some projects in the private sector, with renewables
Czech Republic	Renovation requirements on depth and integration of renewables
Denmark	More private projects, more flexibility, and more storage
Estonia	No data
Finland	More heat pumps and renewable integration in public and private buildings
France	More integral renovations (energy and carbon performance) in the public sector and social housing
Germany	More attention being paid to user needs, involving deep renovations
Greece	More renewables in public building projects
Hungary	More private, industrial, and DHC projects (public sector to take off)
Ireland	More renewables, deep retrofit, and increased relevance of decarbonisation in public and private buildings
Italy	More renewables, more integral renovations, at least in the public sector
Latvia	More renewables (mainly in target market of private residential buildings)
Lithuania	Uncertain
Luxemburg	No data
Malta	No expectations for take-off
Netherlands	Storage in new buildings, heat pumps, both in public and private buildings.
Poland	Financing uncertainties may bring in shorter contracts; strategic development of the residential sector
Portugal	Building management systems (private sector only as far the the public sector regulatory barriers are not lifted)
Romania	No expectations for change (take off)
Slovakia	More public buildings (lower grant ratios)
Slovenia	Residential (on-bill, grants)
Spain	More municipal buildings
Sweden	Uncertain
EU	Integral renovation, renewables, focus on decarbonisation (contracting)

Source. JRC based on EU Survey 2022.

7 Barriers and drivers

The sectoral stakeholders consulted in the EU Survey 2022 listed the barriers and drivers for 2019-21 and as foreseen for 2022-24. **Figure 21** and **Figure 22** collect the most important barriers and drivers, focusing on those relevant to EnPC markets. However, structural factors determining the activity in energy performance have also been included, based on the importance indicated by the experts participating in the EU Survey 2022 and expert revision by JRC experts and anonymous reviewers of the data presented.

The barriers and drivers mentioned for each MS and period are of limited comparability with those highlighted in previous years and between MSs. They largely depend on the subjectivity of experts and these factors addressing different analytical levels. To enable market comparison, further research should rely on the consolidated factors identified in this report – which, for the first time, bring together public and private sectors as well as all the end uses addressed by EnPC – to ask participants to select the most relevant ones and rank them in order of relevance.

Comparison between the 2019-21 and the 2022-24 period shows a marginal reduction in the number of barriers and a singular increase in that of drivers.

7.1 Barriers

The barriers presented in **Figure 21** are organized in the dimensions of a) Awareness, information, training, and technical assistance; b) Finance; c) Policy; d) Subsidies; and e) Structural. The amount of barriers highlighted in the EU Survey 2022 for each category is generally smaller for 2022-24 than for 2019-21. This can be partially due to experts preferring to comment on the previous situation and the lower insight of the authors on the forthcoming period. Moreover, structural barriers are less relevant in 2022-24 than in 2019-21 because Covid had relevance only in the previous period. However, the context of inflation and uncertainty in 2022 may have influenced expert estimates and is highlighted in 4 MSs: Croatia, Germany, Netherlands, and Poland. It is also worth noting that renovation and energy subsidies are considered a barrier in 16 MSs (two sets of MSs) for both periods.⁵¹ The availability of high rates of subsidized public support to building renovation and energy efficiency, and building performance compete with EnPC by providing the financial means of projects that are then completed through simpler and cheaper contracting modalities than EnPC. Energy subsidies and low energy prices counter the cost-effectiveness of interventions and extend repayment periods, making EnPC less financially suitable (reported for Belgium, Bulgaria, France, Germany, Lithuania, Poland, and Slovenia).

The barriers that are relevant in more MSs in the domain of awareness, information and training are knowledge and expertise of clients, trust in the model, and complexity of the model (mentioned in at least 9 MSs each and highlighted at EU level by experts providing input at this scale in the EU Survey 2022).

- Knowledge and expertise of clients (mentioned in 10 MSs for both periods), which often appears in combination with a preference for short-payback periods (e.g., Denmark, Spain), preference for simpler models (e.g. France)
- Trust in the EnPC model could improve since it was mentioned in 10 MSs in 2019-21 and 6 MSs in 2022-24. The barrier could be losing relevance in Austria, Belgium, Cyprus and Germany.
- The model's complexity is considered relevant (in either period) for 9 MSs. In two of these, the barrier is specifically relevant to the public sector, i.e. Sweden and Germany.

In the finance domain, the most widespread barriers are debt treatment, lack of affordable financing for providers, and integration of decarbonisation (mentioned in at least 7 MSs each).

- Treatment of EnPC as a debt of clients was mentioned in Bulgaria, Czech Republic, Denmark, Latvia, Poland, Slovakia, and Spain and is a matter that deserves consideration in several more MSs for the development of the model – as such, was highlighted by EU-level experts participating in the EU Survey 2022;

⁵¹ Considering expert responses for the two periods being assessed and both the subsidies to energy efficiency and building performance interventions had or are expected to have a negative effect in the public or private sectors' markets of Belgium, Bulgaria, Croatia, Cyprus, Estonia, Ireland, Italy, Lithuania, Poland, Portugal, Romania, Slovenia and Spain).

- The limitations of the financing environment for EnPC to deal with deep renovation – due to limited financial backing for long-term return and the integration of renewables – and integral renovations, incorporating renewable generation – restricted by the Eurostat and EIB guidelines for the off-balance treatment of EnPC projects. – altogether referred in Austria, Belgium, Croatia, Germany, Ireland, Poland, Romania, Slovakia and Sweden;⁵²
- Adding to the above, the limited availability of competitive financing for providers was highlighted as a barrier for the markets of Cyprus, Finland, France, Hungary, Ireland, Latvia, Netherlands, Slovenia, and Sweden.

The most frequent policy issues are Policy commitment, Administrative burden, Legal and procurement barriers, and Policy uncertainty.

- Policy commitment on the part of national authorities is considered insufficient in Czech Republic, Estonia, Hungary, Ireland, Latvia, Poland, Portugal, Romania, Slovakia, Spain and Sweden, especially in the period 2019–21 (11 MSs). There are expectations for change in this domain, e.g. in Latvia and Czech Republic;
- Legal and procurement barriers were identified as a barrier in 14 MSs for 2019–21 and in 9 MSs for 2022–24, overall in Bulgaria, Croatia, Cyprus, Estonia, Finland, France (expected to be overcome with a new procurement law), Hungary, Italy, Latvia, Poland, Portugal, Romania, Slovakia and Spain. Sometimes, the legal framework is unclear about using EnPC (e.g. Italy and Hungary), or there are legal enforcement issues (Cyprus).
- The administrative burden can put off clients' interest and raise costs and was highlighted in Belgium (where different state requirements add to the administrative costs of providers), Bulgaria, Estonia, France, Germany, Portugal and Spain.
- Policy uncertainty related to the contents and implementation of RRP is considered a barrier in several MSs by experts looking retrospectively at their expectations in 2020 and 2021. This barrier was mentioned in Austria, Bulgaria, Croatia, Cyprus, Germany, Ireland, Romania, Slovenia and Spain. It was mentioned as a key issue at the EU level by expert participants reflecting on the overall EU. Adding to this uncertainty, slow programming (Slovenia) or annual programming (Hungary) limits the capacity of the market to forecast and adjust to public demand.
- Some issues of mixed regulatory and financing nature are the possibility or difficulty of combining grants with EnPC (e.g. Croatia, Poland, Portugal) or its off-balance options (e.g. Slovakia).

Subsidy allocation could be considered an aspect of policy, financing, and structural nature in some MSs. Because of this and its relevance in MSs, it is presented separately. Investment subsidies are considered to compete with EnPC at least in 14 MSs, i.e. Belgium, Bulgaria, Croatia, Cyprus, Estonia, Ireland, Italy, Lithuania, Poland, Portugal, Romania, Slovenia and Spain. In some MSs, after a period of uncertainty, there is increasing concern that the RRP increases the availability of grants which compete with EnPC (Bulgaria, Croatia, Romania, Spain). In Belgium, where grant deployment was not considered an issue for past EnPC development, the RRP is expected to have a negative impact due to using investment grants and subsidized energy prices (the latter is also the case in France). This topic is reviewed separately in Section 10.

From the structural barriers, the administrative and regulatory division of markets (e.g. in federal states) is one with potential to support EnPC development even in some developed markets. Market size as related to the MS' size or its administrative division were reported as issues in Belgium (especially the public market), Cyprus, Estonia, France, Germany and Slovenia. For instance, in Germany, there is a need to standardize models across states. Also, in some MSs, early interventions in low-hanging fruits (Finland and Sweden) have made the potential for EnPC more difficult to exploit without engaging long and life cycle benefits of EnPC.

There are also concerns that the decarbonisation drive may have an unexpected effect, e.g. in markets such as Portugal, Cyprus, Denmark, Finland, Germany, Italy, the Netherlands, and Latvia, where renewables and simpler interventions may take away the interest in efficiency and for EnPC, especially in its off-balance modalities for the public sector.

⁵² For instance, in Austria and Belgium, the public sector approaches to retrofit and decarbonisation above the typical Energy savings achieved with EnPC in buildings of 30%.

Figure 21. Most relevant barriers identified at the MS level for 2019-21 (in white) and 2022-24 (in green)

MS	Awareness, information, training, TA							Finance					Policy					Subsidies		Structural			
	Awareness clients	Knowledge-expertise clients	Trust on model	Information, demonstration	Complexity of EnPC	Scale- Aggregation capacity	Facilitation	Debt treatment- cash flow	Core business	Decarbonisation, deep renovation	Return periods	No/expensive financing for EnPC	Policy commitment	Other focus (RES, district.)	Administrative burden	Legal barriers	Policy uncertainty	Grants, subsidies, loans	Energy subsidies/ prices	Atomized market	Covid	Inflation, supplies, war	
Austria			P		A	A			A	A						P							
Belgium			P		A					P				A	A			B	B	P	P		
Bulgaria	A							P						P		A	A	A	A		A		
Croatia									A	A					A	A	A	A				A	
Cyprus		P	P	A		A				A	A	P		A	A		P			A	A		
Czech	P							A	B		B		P						A	A			
Denmark								B					P	P	P								
Estonia												A	A		A	A		A	A	A	A		
Finland		P												A		P					A		
France					A	A	P	P				A	A		B	P			B	B	P		
Germany			P	P	P				A	A		A		P	P	A	A	P	P			A	
Greece		A	A	A	A		A											B					
Hungary		A			A							A	A		A	A							
Ireland	A	A	A	A	P	P			A	P	B	B	A	A			A	B	B				
Italy		A	A				P							A	A			B	B				
Latvia			A	A				P				A				P							
Lithuania			A	A														A	A	A	A		
Luxemburg																							
Malta						A	A																
Netherlands		A	A	A	A							A	A									A	A
Poland								P	P	B	P			P				P	P		P	B	
Portugal	A				A								P	P									
Romania		P	P		A	A				A			P				A	A	P	P			
Slovakia								P								P							
Slovenia		A	A		A	A				P	B	A	A					B	B	A			
Spain		A	A					P			B							P	P		A		
Sweden			A	A	P	P				A	A	P	P										
EU input		P	P		A	A		A									A	P			A	A	

Source: JRC, based on EU Survey 2002. Responses to: "What are in your understanding the major drivers and barriers explaining previous (2019-2021) and current trends (2022-2025)?" Data in bold are the most relevant barriers. "A" Indicates "Overall market, public and private sectors", "B" "Private sector", and "P" Public sector" as clients of EnPC.

7.2 Drivers

The drivers presented in **Figure 22** are organized in the dimensions of a) Awareness, information, training, and technical assistance; b) Finance; c) Policy; and d) Structural. The category of subsidies was not included as drivers. The amount of drivers identified through the EU Survey 2022 and additional literature review for each category is generally larger for 2022-24 than for 2019-21, even though, as argued for Barriers, expert respondents appear to be more comfortable in describing the past than the forthcoming situation and hence is considered most reliable source when no specific changes may have been critical.

In the domain of awareness, information, training and technical assistance, the drivers that are relevant in more MSs are established trust and interest in the model (7 and 9 MSs in 2019-21 and 2022-24, respectively), the availability of provision (6 MSs in 2019-21), and technical assistance received in the past (7 MSs in 2019-21). Technical assistance (especially ELENA, Horizon 2020/ Horizon Europe /LIFE), moreover, was widely appreciated as the most impactful EU supporting mechanism in most MSs (Further reviewed in Section 11)

In the finance domain, the most widespread drivers are national and EU support (8 and 13 MSs in 2019-21 and 2022-24, respectively), and the role of EnPC in the cash flow and indebtedment of clients, mainly municipalities but also private actors (e.g. Belgium) (9 MSs in both periods). There are increased expectations for public support in Austria (support of a guarantee fund), Belgium, Croatia, Cyprus, and Germany, even though in some of these MSs, RRP grants are expected to compete with the model. In Belgium, whilst the Federal Government is expected to allocate €1b for building renovation, the Walloon government plans to use grants to support EnPC renovations of buildings. In Croatia and Latvia, grants may act as a driver (although generally competing with EnPC). On the contrary, a major driver in some other MSs is the combination of EU funds and private financing, along with the standardization of the EnPC model. As for the treatment of EnPC in the accounting balance of private actors, there is renewed interest for EnPC and EEaaS after leasing has been categorized as on-balance in the IFRS rules. Well-established private financing mechanisms are also relevant in Czech Republic, where forfaiting is well established, creating an adequate environment for off-balance contracting.

In the regulatory domain, there are increased expectations for the EU regulatory framework and strategies to improve the situation of the EnPC market in terms of driving investment towards buildings (6 MSs in 2022-24) and decarbonisation (9 MSs in 2022-24); the use of Energy Efficiency Obligations and White Certificates (9 MSs in 2022-24). The decarbonisation drive, however, may have an unexpected effect. In some markets, such as Portugal, Cyprus, Denmark, Finland, Germany, Italy, the Netherlands, and Latvia, renewables may take away the interest in efficiency and EnPC, especially in its off-balance modalities for the public sector. The European Green Deal and the recast of the EED and the EPBD directives were also mentioned in 4 MSs in 2022-24. The perspective of Carbon taxation is relevant for experts in 7 MSs in 2022-24.

At the national level, the legal framework and the national push are considered to drive the market in 11 MSs (Austria – energy efficiency law -, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, the Netherlands, Slovakia, and Spain –in the latter with some degree of uncertainty). For instance, in Finland, there is an expectation for a regulatory push involving incentives and funding priority for EnPC and the development of model contracts. In France, there are high expectations for the approval of third-party financing for EnPCs in the public sector. In Slovakia, there are expectations on a requirement for projects to be tested for their EnPC-ability. The government's interest was also identified in Romania, even though the RRP makes little reference to EnPC, is restricted to the industry, and is uncertain whether positive steps are expected to be taken in the next two years. A similar position would be desirable in other MSs with limited borrowing capacity in their public sectors, such as Hungary. However, signals from the government to clarify the role of and regulations on EnPC have not been identified.

From the structural barriers, energy prices gained relevance. In 10 MSs, these were mentioned as already driving demand in EnPC during 2021. Energy prices were mentioned as a market driver for 2022-24 in 19 MSs. Structural drivers relevant to specific MSs are the building stock condition, e.g. in Latvia and Lithuania.

Finally, EnPC appears to be driven by the EU strategic and regulatory developments, sectoral capacities (e.g. stabilised trust and increased interest), which have largely developed through technical assistance and providers' activity, and a combination of EU and national support to the model.

There are also concerns that the decarbonisation drive may have an unexpected effect, e.g. in markets such as Portugal, Cyprus, Denmark, Finland, Germany, Italy, the Netherlands, and Latvia, where renewables and simpler interventions may take away the interest in efficiency and for EnPC, especially in its off-balance modalities for the public sector.

Figure 22. Most relevant drivers identified at MS level for 2019-21 (in white) and 2022-24 (in green)

MS	Awareness, information, training, Technical a.								Finance			Regulation								Structure	
	Stablihed, trust, interest	Facilitation, One-stop-shops	Provision	Technical assistance	Model contract	Guidance	Demonstration	National and EU support	Cash flow-debt treatment	Private financing	EU drive buildings	Obligations, White Certificates	EGD, EED, EPBD	RRP	Decarbonisation drive	CO2 cost, carbon tax, ETS	Legal framework	National push	Energy prices, shortages	ESG, real estate value	
Austria																					
Belgium	A	A	A	A																	
Bulgaria																					
Croatia				A			P	P													
Cyprus	P	P		A	A	P		P		P											
Czech																					
Denmark																					
Estonia	A	A																			
Finland																					
France		P																			
Germany		P																			
Greece																					
Hungary				A																	
Ireland	A	A	A	A																	
Italy																					
Latvia				A	A																
Lithuania																					
Luxemburg																					
Malta																					
Netherlands			P																		
Poland		A		A																	
Portugal	A	A																			
Romania																					
Slovakia	A		P																		
Slovenia																					
Spain			A																		
Sweden	A	A																			
EU input																					

Source: JRC, based on EU Survey 2002. Responses to: "What are in your understanding the major drivers and barriers explaining previous (2019-2021) and current trends (2022-2025)?" Data in bold are the most relevant drivers. "A" Indicates "Overall market, public and private sectors", "B" "Private sector", and "P" Public sector as clients of EnPC.

8 Regulatory framework

The implementation of key regulatory aspects for developing EnPC markets was assessed by experts participating in the EU Survey 2022. These were asked to rate on a scale ranging from absent (0) to very good (3) the implementation and adequacy of the a) Definitions; Guidelines (EED Art. 18); c) Model contracts (EED Art. 18) for the public and private sectors; d) Lists of qualified operators (EED Art. 18); e) One-stop-shops (EPBD Art. 20; EED Art. 18); f) Information (EPBD Art. 20; EED Art. 18); g) Demonstration, h) Energy Efficiency Obligations (EED Art. 7.) (and if relevant White Certificates); i) Energy Audits (EED Art. 8); j) EnPC to fulfil Exemplary role of public buildings (EED Art. 5); and k) Procurement, contracting and tendering (EED Art. 18). The values obtained were critically reviewed and when needed, average values were calculated (**Figure 23**). This form of assessment is largely subjective. However, it provides a quick picture of the regulatory framework and overcomes language limitations in accessing national regulatory frameworks and publications (e.g. lists of EnPC providers).

A review of the EU averages and EU-level estimates in **Figure 23** indicates that:

- The best-appraised instruments as implemented by MSs are audits (rated as “good”) followed by definitions, guidelines, model contracts for the public sector, and demonstration (rated as between “barely acceptable” and “good”).
- The rating of lists of qualified operators largely differs between EU averages and EU-level estimates. It likely indicates that lists of service providers are mostly available for energy services (as required by Art. 18) and not specifically addressed to EnPC providers. These issues are important because EnPC providers need specific capacities to provide technical and financial guarantees.⁵³
- Besides considerations on the lists of providers, the lowest ratings refer to rules of procurement, contracting and tendering (EED Art. 18), Obligations/White Certificates (EED Art. 7), information provision (EPBD Art. 20; EED Art. 18), One-stop-shops (EPBD Art. 20; EED Art. 18) and, especially, the Exemplary role of public bodies’ buildings (EED Art. 5) as mechanisms to support EnPC. These instruments were rated in the ballpark of barely acceptable. The use of EnPC in fulfilling exemplary obligations was rated as “absent” in EU-level estimates.

Figure 23 also shows the existence of major regulatory issues, as appraised by national experts, in a wide array of MSs.

- Those MSs where regulatory aspects are rated below “good”, especially those below “barely acceptable”, tend to have a limited EnPC market or difficulties taking off. The former cases include Hungary, Denmark, Poland, Portugal, and Romania; the latter includes Bulgaria, Cyprus, Croatian public buildings, Greece, Ireland, and Latvia.
- In some MSs, the rating of regulatory implementation is below expectations according to market development status. Such is the case of Italy and Spain, whose frameworks scored between “good” and “barely acceptable” (1.3 and 1.5, respectively). Although both MSs have a well-developed market, the responses of national experts largely vary, indicating the need for market monitoring, starting with lists of EnPC providers and project databases.⁵⁴
- Best-rated implementation frameworks (“good” and better) also correspond with well-developed EnPC markets, i.e., Belgium, Czech Republic, and Slovenia. One exception is Finland, which, having a well-rated framework, has a less active market. France and Germany have relatively well-developed markets and ratings of their framework (1.7 and 1.8, respectively). France exemplifies the limited attention paid to official lists of EnPC providers, even in developed markets. Germany exemplifies the limited attention paid to the exemplary role of public bodies’ buildings as a mechanism to further the development of EnPC markets. These two domains, official lists and exemplary role of public buildings, are discussed below.

⁵³ The fact that most participating experts in the EU Survey 2022 are active in the services market could have an influence in national-level ratings of this instrument. Due to language barriers, a thorough check of the availability and quality of lists was not conducted.

⁵⁴ The relatively low values obtained for Spain and Italy respect to their status of market development in both MSs to the high variability of input received in Italy and the lack of consolidated information on their fragmented markets, where activity takes place at regional and local level. In Spain, information, the development of a White Certificates market, limited use of EnPC in the central government buildings, and the provision of information are the areas identified as needing most attention improvement.

- Developing specific lists of EnPC providers, ideally supported with certification, is not part of the requirements in Article 18 of the EED, which is focused on energy service providers. However, publishing specific lists of EnPC providers could improve trust in the model. Such is the case of France, Croatia, Netherlands, Poland, and Romania, among others.
- The use of EnPC as a means to fulfil the exemplary role of public buildings has been reviewed as being in the ballpark of barely acceptable in Austria, Bulgaria, Croatia, Cyprus, Czech Republic, Finland, Germany, Greece, Ireland, Italy, Latvia, Slovenia and Spain; as absent or almost absent in Croatia, Cyprus, Denmark, Hungary, Lithuania, Poland, Portugal, Romania, and Slovakia. Only the Netherlands and Sweden were rated as good in the domain of exemplarity. The procurement rules rate significantly below average national implementation of the regulatory framework in 6 MSs and below good in 7 other MSs (respectively Austria, Bulgaria, Croatia, Germany, Greece, and Romania; and France, Hungary, Ireland, Latvia, Poland, Portugal, and Spain). They are rated as good only in Belgium, Czech Republic, Denmark, Italy, Netherlands, and Slovenia (very good). Revision of EnPC as an element contributing to the exemplary role of public bodies' buildings – alongside development of procurement rules e.g. in terms of improving consistency – is expected to need revision in most MSs willing to exploit the potential of EnPC. These considerations are expected to gain relevance with the introduction of the recast of the EED.

A revision of the status of implementation of the EU regulatory framework shows that in most MSs, there is room for improvement. Considerations about the status and quality of implementation of this framework are needed in those MSs willing to rely on EnPCs to exploit their energy-saving potential.

Figure 23. Expert appraisal of MSs' implementation of the EU regulatory framework

MS	Definitions	Guidelines (EED Art. 18)	Model contracts public sector (EED Art. 18)	Model contracts private sector (EED Art. 18)	Lists of qualified operators (EED Art. 18)	One-stop-shops (EPBD Art. 20; EED Art. 18)	Information (EPBD Art. 20; EED Art. 18)	Demonstration	Obligations /White Certificates (EED Art. 7)	Energy Audits (EED Art. 8)	EnPC to fulfil Exemplary role (EED Art. 5)	Procurement, contracting and tendering (EED Art. 18)	MS Average
Austria	2.5	2.5	2.5	2.0	1.5		1.0	2.5	1.0	1.0	1.0	1.0	1.7
Belgium	3.0	3.0	3.0	3.0	2.0	2.0	0.5	2.0	0.5	2.5	1.5	2.0	2.1
Bulgaria	2.0	1.5	2.0	2.5	1.5	0.5	0.5	2.0	0.0	1.0	1.0	1.0	1.3
Croatia	2.0	1.0	2.0	0.5	0.5	0.5	1.0	1.0	1.0	2.0	0.5	0.5	1.0
Cyprus		0.0	0.0		2.0	0.0	0.0	0.0	0.0		0.0		0.3
Czech R.	2.0	2.0	3.0	3.0	3.0		2.0	3.0	0.0	1.0	1.0	2.0	2.0
Denmark	1.0	0.0	0.0	0.0	1.0	2.0	1.0	2.0	1.0	2.0	0.0	2.0	1.0
Estonia													
Finland	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	1.0	3.0	1.0	2.0	2.3
France	2.0	1.0	1.5	2.0	0.0			2.0	2.0	3.0	1.5	1.5	1.7
Germany	1.7	2.0	2.3	1.5	1.7	2.0	2.0	2.3	1.7	2.0	1.0	1.0	1.8
Greece	2.0	1.0	1.0	1.0	1.0		1.0	1.0	2.0	2.0	1.0	1.0	1.3
Hungary	0.5	1.0	0.5	0.5	0.0	0.0	0.0	0.0	0.5	2.0	0.5	0.5	0.5
Ireland	1.3	1.7	2.3	2.3	0.3	0.5	1.0	1.5	1.5	2.0	0.7	1.7	1.4
Italy	0.5	1.5	1.5	1.5	2.0	0.5	0.0	0.0	2.0	2.5	1.0	2.0	1.3
Latvia	1.5	2.0	1.5	1.5	1.0	1.5	1.0	1.0	1.5	2.5	1.0	1.5	1.5
Lithuania			0.0								0.0	0.0	
Luxemburg													
Malta													
Netherlands	2.0	1.0	1.0	2.0	1.0	2.0	-	1.0	-	-	2.0	2.0	1.6
Poland	2.0	1.0	2.0	1.0	0.0	0.0	1.0	1.0	2.0	1.0	0.0	1.0	1.0
Portugal	2.0	1.0	0.0	1.0	2.0	0.0	1.0	0.0	0.0	2.0	0.0	1.0	0.8
Romania	1.0	1.0	1.0	0.0	1.0		0.0	0.0	0.0	3.0	0.0	0.0	0.6
Slovakia	2.0	2.0	3.0		2.0	1.0					0.0		1.7
Slovenia	2.5	3.0	3.0	1.5	2.0	1.0	2.0	3.0	2.5	2.5	1.0	3.0	2.4
Spain	2.7	1.7	2.7	2.0	1.7	1.5	1.0	2.0	0.0	2.0	1.0	1.3	1.5
Sweden	1.0	2.0	2.0	2.0	1.0	1.0		2.0	2.0	3.0	2.0		1.8
EU estimate	1.5	1.5	1.5	1.0	0.0		1.0	1.5	1.0	2.0	0.0	1.0	1.2
EU average	1.8	1.5	1.7	1.6	1.4	1.1	0.9	1.5	1.1	2.1	0.8	1.3	1.5

Source: JRC based on EU Survey 2022. The magnitudes are based on the average ratings granted by experts in their responses to the question: "Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good)." The colour code indicates the largest magnitudes in green and the smallest in red, ranked for the overall set of values.

9 Balance-sheet treatment of EnPC investments

The balance-sheet treatment of EnPC in clients' accounts is an important consideration for the latter's creditworthiness. It is in the interest of Member States with high levels of debt to maintain EnPC investment in the public sector outside the scope of public debt, also known as pursuing Maastricht-neutrality. In addition, MS-level rules can apply to public bodies, e.g., regional and local authorities. For private clients, IFRS rules and the Consumer Credit Directive are the relevant references to assess the balance status of EnPC investments funded through the EnPC provider.⁵⁵

Efforts of MSs to adapt public model contracts to maintain investment off-balance sheet was an important driver of EnPC standardization after the publication of a set of ESA rules in 2010 and until the Covid pandemic. A series of conditions need to be met for EnPC projects to be accounted as off-balance, in which case, only the regular payments to the ESCO are accounted as debt. The Eurostat Guidance Note of September 2017 and the Eurostat and EIB Guide to the Statistical Treatment of Energy Performance Contracts of May 2018, off-balance treatment in EnPC involves a series of requirements:

- a) the provider makes the investment;
- b) the provider bears the majority of risks;
- c) contracts have a minimum duration of 8 years;
- d) there is a limit to 50% of the investment for on-site energy generation;
- e) the provider takes responsibility for the maintenance of the installed technology;
- f) the guaranteed economic savings are larger than operational payments;
- g) savings can be offset between aggregated projects in a bundled projects contract.

Regarding financing sources, financing from the EU, the EIB and other international bodies is allowed. Forfeiting can also be part of off-balance contracts (Fi-Compass 2020). Forfeiting is a key instrument to remove the credit burden on EnPC contracts, enabling providers to take on more contracts, particularly contracts with guaranteed savings where the provider takes the financial risk.⁵⁶ If these conditions are met, the public sector can write off EnPC expenditure from its accounting books, and only regular payments are to be recorded ("Maastricht neutral contract"), virtually leaving untouched public sector capacity to sign more contracts and save more energy.

The experts participating in the EU Survey 2022 were asked to a) assess the impact of the updated statistical treatment of EnPC in government accounts (Eurostat Guidance note of September 2017 and the Guide to the Statistical Treatment of Energy Performance Contracts of May 2018); b) estimate the percentage of off-balance contracts in the EnPC sector of their MSs; c) to indicate the existence of off-balance contracts in the public sector and to comment on the situation; and d) to indicate other budgeting rules acting as barriers to the adoption of EnPC for its impact on the balance of public clients (**Figure 24**).

As reported by the JRC in 2021, the debate around off-balance contracting caused some market stagnation in some public markets between 2010 and 2018 previous years. In 2019-20 the development of off-balance contracts brought attention back to EnPC. As reviewed in JRC 2021, a series of MSs started to develop off-balance sheet model contracts for the public sector. The report collected developments in Finland, Italy, Slovakia, Slovenia, Austria, Belgium, Croatia (public lighting), Denmark, Portugal, and Spain. The statistical treatment was of little relevance due to favourable financing conditions in Austria, Germany, Czech Republic, the Netherlands, and Sweden. However, there was renewed interest in off-balance contracting in the public sectors of Germany and the Netherlands. Also, off-balance contracting models and experiences have been reported in Hungary (contract in use by providers, not backed by the government), Ireland, Lithuania, Poland, Romania (contract not yet accepted by the sector), Latvia (approved as PPP by Eurostat). Nowadays, there is reported the existence of off-balance contracts in 17 MSs (i.e. Austria, Belgium, Croatia – for lighting-, Finland, Greece, Germany, Hungary, Ireland, Italy, Latvia, Lithuania – without activity yet-, Netherlands, Poland, Portugal –public lighting –, Romania, Slovakia, Slovenia, and Spain.⁵⁷ Activity with this modality was

⁵⁵ Refers to COM (2021) 347 final, Proposal for a Directive on consumer credits, and Directive 2008/48/EC on credit agreements for consumers, and IFRS rules on leasing of 2019.

on consumer credits

⁵⁶ This condition does not apply to forms of refinancing which take place within time boundaries and physical implementation of an EnPC.

⁵⁷ The situation is uncertain in Luxemburg, and Malta, about which no specific input was received.

not reported in Romania and Lithuania and was limited in Latvia. Data on the percentage of off-balance contracts was not obtained for the Netherlands and Slovakia.

However, the number of off-balance contracts signed in the EU is estimated to be relatively low, at around 8%, well beyond the average of national estimates. Only a few projects have been reported and officially approved by Eurostat in Greece, Spain, and Slovakia. The EnPC model (as a PPP) has also been approved for Latvia, but no project using this model has yet been reported. Moreover, several of these model contracts for the public sector were assessed by responding experts as needing adaptation. Such input was received from Austria, Hungary, Finland, Italy, Lithuania, Netherlands, Portugal, Poland, Slovenia and Spain.

Demands for adaptation and update largely refer to the need for simpler and more flexible models. Some experts understand that addressing this implies that EnPCs focus on their energy-saving purpose and are free from the complexity of the PPP background. Expert recommendations for EnPC development largely focus on deep renovation and longer-term contracts to decarbonise buildings. However, this is not easy within Eurostat-compliant contracts and calls for using EnPC in parallel with direct contracting, funded by the client or public funding and financing sources. The same applies to integrating renewable generation beyond 50% of the intervention cost and including maintenance contracts as a part of EnPCs. The latter is reported as particularly problematic in Slovakia, where there is an interest in integrating pre-existing maintenance contracts in EnPCs. Fundamentally, it has been recommended that “Contracts should be standardised to facilitate aggregation, but flexible enough to facilitate multi-technology and deep retrofit solutions...Many of the contracts are too strict and too close to the Eurostat guide.” One option is to separate EnPC contracts from the overall building renovation to simplify the EnPC, ease its off-balance treatment, and address longer-term investments, renewables and maintenance through other funding forms, including subsidies.

Besides the national development of Eurostat-compliant models, at the subnational level, national budgetary rules impose debt liabilities to regional and local authorities and limitations to engage in public-private partnerships in at least 5 MSs, as reported in Bulgaria, Denmark, Ireland, Latvia, Lithuania, and some German states.⁵⁸ Moreover, there are regulatory restrictions for public authorities to engage with EnPC financing in France and interventions in public buildings in Portugal.⁵⁹

Aligning with the review of barriers in Section 7, in the public sector of MSs, there is a continued need for closer monitoring of the EnPC market and support for contract development, guarantees and forfeiting capacities for EnPCs not to be accounted as debt in the balances of MSs and public bodies, and for EnPC to contribute to the EU strategic goals of saving energy and decarbonising buildings.

In addition to the considerations above on the public sector, the private sector appears to be increasingly interested in off-balance treatment. This dynamic was reported as existing and having increasing relevance in Belgium, Denmark, Ireland, Slovenia and Spain. The IFRS Foundation set the worldwide standard, which in 2019 updated its rules on the balance treatment of leasing (IFRS, 2019), potentially favouring EnPC and Energy Efficiency as a Service (EEaaS) instead of leasing modalities. Regulatory developments at the EU level about consumer credits and credit agreements for consumers need to align with market needs and strategic pathways to consider the particularities of EnPC contracts.⁶⁰

Figure 24. Impact of the updated statistical treatment of EnPC in government accounts, percentage of off-balance contracts, the existence of off-balance models in MSs, and remaining budget allowance limits for subnational public bodies.

	Impact	%	Yes /No	Commentary	Other budget allowance limits
Austria	0.0	0	No	Not needed	
Belgium	0.5	7	Yes	Local projects and private sector	

⁵⁸ A similar situation was reported in Moles-Grueso, Bertoldi, and Boza-Kiss (2021) for Austria, Belgium and the Netherlands but was not identified in the EU Survey 2022. In Lithuania, EnPC is subject to PPP law, which restricts the adaptation of the model to market needs.

⁵⁹ The French law was modified on the 30th of March 2023, making possible for public clients to pay the investments with the savings without using an public-private-partnership but the law requires conditions considered by sectoral experts as difficult to respect ([LOI n° 2023-222 du 30 mars 2023 visant à ouvrir le tiers financement à l'Etat, à ses établissements publics et aux collectivités territoriales pour favoriser les travaux de rénovation énergétique \(1\) - Légifrance \(legifrance.gouv.fr\)](#))

⁶⁰ During the drafting of this report, issues on the interpretation of the Consumer Credit Directive were reported only in the Netherlands.

Bulgaria	0.0	0	No		Municipal liabilities
Croatia	1.5	100	Yes	Lighting only	Need a contract model for public buildings
Cyprus	0.0	0	No		
Czech Republic	-2.0	0	No	Issues with maintenance, forfeiting	
Denmark	0.0	0	No	Incompatible with Danish subsidies	Municipal liabilities
Estonia					
Finland	0.0	30	Yes	Need adaptation	
France	0.0	0	No	No	Third-party financing difficult
Germany	0.7	60	Yes		Part of the budget allowance in some states
Greece		25	Yes	Local authorities, Eurostat approved	
Hungary	0.0	50	Yes	Local governments	
Ireland	0.0	20	Yes	Yes, satisfactorily	Part of the budget allowance of local authorities
Italy	2.0	100	Yes	Need adaptation	
Latvia	0.0	1	Yes	Eurostat approved under PPP	Municipal liabilities
Lithuania	-1.0	0	Yes	under PPP; no activity	Municipal liabilities
Luxemburg					
Malta					
Netherlands	0.0		Yes	Need adaptation	
Poland	1.0	20	Yes		
Portugal	0.0	100	Yes	Need adaptation	Not possible for buildings
Romania	2.0	0	Yes	Not agreed by the sector	
Slovakia	2.0		Yes	Eurostat approved	
Slovenia	1.5	20	Yes	Local authorities and private sector	
Spain	1.7	67	Yes	Local authorities, Eurostat approved	
Sweden	0.0	0	No	Not needed	
EU estimates	0.0	8		Need adaptation; only 3 projects verified	
MS Average	0.4	27			

Source: JRC based on EU Survey 2022. Response to the questions: "Please explain whether and how the approach of the public sector to EnPC has changed as the result of the updated statistical treatment of EnPC in government accounts...", "Have off-balance contract models been produced?" and "Other barriers in budgeting rules". The colour code indicates the largest magnitudes in green and the smallest in red, ranked for the overall set of values.

10 EU support

The expert review collected in the EU Survey 2022 grants assessed the relevance of EnPC markets development in the MS using a scale from -2 (very negative impact) to +2 (very positive impact), where 0 depicts a neutral impact. The EU support categories assessed were: a) Technical Assistance (ELENA, Horizon 2020/ Horizon Europe and PDA); b) Guarantee Facility of the Smart Finance for Smart Buildings initiative (2018-2020);⁶¹ c) De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit **Figure 25**;⁶² c) Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27); e) Recovery and Resilience Facility (RRF); and f) the package of the European Green Deal and Fit for 55 strategy (**Figure 26**, for the latter three).

An overview of **Figure 25** and **Figure 26** shows that technical assistance is the most positively appraised EU supporting mechanism for the EnPC public markets and, to an extent, financing actors. The major barriers found concerning technical assistance are its time-consuming and costly application and administration for applicants (indicated in Czech Republic, Slovenia, Ireland, and Hungary) and the investment thresholds (Austria, Bulgaria, and Portugal). The latter barrier is particularly relevant wherever the capacity to pool projects is not developed and is a barrier for countries with fragmented markets, e.g. Austria, due to its federal system. Technical assistance also receives the most expert commentary on EU support to highlight its good practices. These include recognition that H2020 PDA has gained in flexibility over ELENA and a set of H2020 projects in Bulgaria, the implementation of InEECo (2015-18) in Baden-Württemberg, with 50 m€ investment, the DeliveREE project (H2020 PDA project) with a pipeline €20m in Ireland, the 5 ELENAs which provided pipeline projects in Slovenia, and the EnPC projects in Spain under H2020 HouseInvest, F-PI, EnerInvest.⁶³

The Guarantee Facility of the Smart Finance for Smart Buildings initiative (2018-2020) was perceived in multiple MSs as having limited to nil impact. Exceptional MSs are Belgium (financing sector), Greece, Latvia, and Lithuania (all four reviewed as having a “very positive impact”), and to an extent Ireland, Finland, Germany, Portugal, Slovenia and Spain (where the impact was assessed as “positive” at least for one sector). A similar assessment was received for the InvestEU mechanisms. The cases of Hungary and Belgium are different (in the former, the InvestEU was assessed as having a “positive” impact, and in the latter “, positive” impact was not referred to). A similar lack of positive assessment applies to the De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit, which only received “positive” reviews in Austria, Ireland, Italy, Lithuania, Slovenia, and Spain. Low to nil values can probably be due to most participant experts' technical profiles. Even if such is the case, low ratings would indicate that the Guarantee Facility of the Smart Finance for Smart Buildings initiative, InvestEU and the De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit have been little known to the sector. Their actual impact on the financing actors to engage with the financing of EnPC providers or their projects is uncertain based on the data collected. Increased communication to the overall sector and not only to financing institutions has been advocated by some experts consulted, according to whom it would be important for providers to know what tools are available for financing actors to argue the financial interest of EnPC. Moreover, there is a need for a specific assessment of the outreach and use of these tools to support EnPC or other strategically suited mechanisms, e.g. to have a multiplier effect on investment.

The expert assessment of the Structural and Investment Funds (2014-20), the Cohesion Policy Funds (2021-27) and the Recovery and Resilience Facility (RRF) indicates that both have positive and negative impacts on different EnPC markets. There are also differences in the relationship of both types of funding with EnPC for the different MSs.

- A positive effect of the RRF in MSs where the use of structural funds is not considered an issue or did not have a major negative effect on EnPC markets was described in 11 MSs, i.e. Belgium

⁶¹ [Smart finance for smart buildings: investing in energy efficiency in buildings \(europa.eu\)](https://europa.eu)

⁶² [Resources | EEFIG Underwriting Toolkit](#). “Energy efficiency underwriting is the process of appraising the value and risks of an investment or a loan in order to make a decision to finance the project in question. Typically, value will be appraised using a financial model and then the risk factors and their potential effects will be identified and assessed. The inputs to the underwriting process are technical, economic and financial – a result of due diligence. The output of underwriting is a decision to invest.” [Toolkit Brochure 0.pdf \(europa.eu\)](#)

⁶³ See references in Annex 2.

(especially in Wallonia), Cyprus, Czech Republic, Finland, Greece, Italy (expected use of lower grant rates), Latvia, Lithuania, Slovakia, Slovenia and Spain.

- Both funds are reported to have a markedly negative impact on the EnPC markets of 3 MSs, Bulgaria (grants compete with EnPC, and the deployment of the RRP is regarded with deep concern), Portugal (EU funding is not allowed for EnPC), and Romania (the legal framework has countered the use EnPC in combination with grants, and there is a high degree of uncertainty about the implementation of the RRP).⁶⁴
- There are no reports of RRFs negatively affecting the EnPC markets of countries where structural funds are not a barrier. Such is the case of Spain and Slovenia, where some initial uncertainties have been overcome. However, the effect of these uncertainties was reported as sizeable at times of post-Covid market recovery.
- The impact of RRF was assessed as nil or unknown in 11 MSs, Austria, Croatia, Denmark, Estonia, France, Germany, Hungary, Ireland, the Netherlands, Poland, and Sweden.

The European Green Deal and the Fit for 55 package are generally appraised positively. They were only reviewed negatively in Bulgaria, reflecting concern about the lack of mechanisms to limit grant competition with EnPC and uncertainty created by negotiations about the taxonomy of green sources. From a review of experts' ratings and opinions, it appears that the European Green Deal has created positive conditions for the EnPC market by revising and consolidating energy-saving and decarbonisation targets and providing clear policy signals to clients and financing actors. The recast of the EED, the EPBD, the Sustainable Finance Disclosure Regulation (SFDR), and the EU taxonomy for sustainable activities were highlighted as particularly positive. Also, as shown in Section 7, there are expectations related to either the overall decarbonisation drive, the introduction of CO2 taxes, and the ETS for buildings (referred for Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Ireland, the Netherlands, Poland and Spain). However, there are concerns about their implementation which are reported as slow (e.g. Ireland, Germany) and impact uncertainties, e.g. about the impact of the EU ETS on buildings (France) and the energy sources that deserve strategic attention (e.g. Bulgaria). State funding and efforts to attain targets and new obligations are also key for the success of the European Green Deal and the Fit for 55 package.

⁶⁴ The negative effect of structural funds appears to have been resolved in the RRF of Croatia, where structural funds were not used for EnPC and providers cannot be beneficiary of EU funds, and the effect of the RRF is perceived as neutral. Barriers to combination of EU funds with EnPC were identified in Croatia (ESCO company cannot be beneficiary of EU funds), in Germany (if an SME is client of a non-SME contractor, the worse conditions for the Contractor apply), Ireland (State Aid rules make Irish grant processes not suitable for EnPC contracts - being revised) and Lithuania (applying to EU funds is found bureaucratically demanding). In Spain EU Funds are not incompatible with EnPCs, but the use of grants and EU funds cause project delays, and some argue that RRF money is difficult to combine with EnPC because the investment must compute as an expense in the balance sheet

Figure 25. Expert assessment of EU supporting mechanisms Technical Assistance, Guarantee Facility of the SFBI, InvestEU, and DEEP and EEFIG Underwriting Toolkit.

MS	Technical Assistance				Guarantee Facility of the SFBI				InvestEU				DEEP and EEFIG Underwriting Toolkit			
	Public	Private	Overall	Financing	Public	Private	Overall	Financing	Public	Private	Overall	Financing	Public	Private	Overall	Financing
Austria			1				0				0				1	
Belgium	2	0	2	2	0	0	0	2			0		0	0	0	
Bulgaria	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Croatia	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Cyprus	1		1													
Czech R	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Denmark	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estonia	1															
Finland			1	0			1	1			1	1			0	0
France																
Germany	2		1				1				1				0	
Greece	2	2	2	0	1	2	2	0	1	2	2	0				
Hungary	2	2	2	2					1	1		2				
Ireland	2			0	2			0				0	1			0
Italy	2	1		1	1	0		1	1	0		1	1	0		1
Latvia			1	1			2	2			1	1	0	0	0	0
Lithuania			2	2			2	2			2	2			2	2
Luxemburg																
Malta																
Netherlands																
Poland			1				0					0			0	
Portugal	1	0		0	0	0		1	-1	-1	-1		0	0	0	
Romania	2	0	2		0	0	0		0	0	0					
Slovakia	2			2												
Slovenia	2	1		0	0	1		1	0	0		1	0	0	1	0
Spain	2	1	1	2	1	1	1	1	0	0	1	1	1	1	1	2
Sweden	0	0	0		0	0	0		0	0	0		0	0	0	
EU estimate	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
MS average	2	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0

Source: JRC based on EU Survey 2022. Expert responses to: "Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral impact". The colour code indicates the largest magnitudes in green and the smallest in red, ranked for the overall set of values.

Figure 26. Expert assessment of EU supporting mechanisms Structural and Investment Funds (ESIF, 2014-20) Cohesion Policy Funds (CPF, 2021-27); e) Recovery and Resilience Facility (RRF); and f) the package of the European Green Deal and Fit for 55.

MS	ESIF (2014-20) CPF (2021-27)				RRF				Green Deal, Fit for 55		
	Public	Private	Overall	Financing	Public	Private	Overall	Financing	Public	Private	Financing
Austria			0.0				0.0		0.0	0.0	0.0
Belgium			0.0		1.0	0.0			1.0	1.0	2.0
Bulgaria	-1.0	0.0	0.0	0.0	-1.0	-1.0	-1.0	0.0	1.0	0.0	1.0
Croatia	-2.0	1.0	-1.0	1.5	0.0	0.0	0.0	0.0	0.5	1.0	1.0
Cyprus					1.0		1.0		0.0	0.0	0.0
Czech R	2.0	1.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	2.0
Denmark	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Estonia					0.0	0.0					
Finland			1.0	1.0			2.0	2.0	1.0	2.0	2.0
France									1.0	0.0	2.0
Germany			1.0				0.0		1.8	1.3	1.0
Greece	1.0	2.0	2.0	0.0	2.0	0.0	2.0	0.0	1.0	0.0	0.0
Hungary									0.0	1.0	1.0
Ireland	1.0		1.0	0.0	0.0			0.0	1.5	0.5	0.0
Italy	1.0	0.0		1.0	1.0	0.0		1.0	1.0	0.5	0.5
Latvia			2.0	2.0			2.0	1.0	1.5	1.0	1.5
Lithuania			2.0	2.0			2.0	2.0	1.0	1.0	1.0
Luxemburg											
Malta											
Netherlands					0.0	0.0	0.0	0.0	1.5	1.5	1.5
Poland			0.0				0.0		1.0	0.0	1.0
Portugal	-1.0	-1.0	-1.0				-1.0		-1.0	-1.0	-1.0
Romania	-2.0	0.0	-2.0				-2.0		1.0	1.0	1.0
Slovakia	2.0		2.0		1.5		2.0				
Slovenia	2.0	1.0		1.0	1.0	0.0	1.0	0.5	1.5	0.0	0.0
Spain	0.0	1.0	1.0	1.0	0.7	0.7	0.0	1.0	1.3	3.0	1.3
Sweden	0.0	0.0	0.0		0.0	0.0	0.0		2.0	2.0	
EU estimate	1.0	0.0	0.0	0.0	0.4	0.2	0.3	0.4	0.5	0.5	0.1
MS average	0.2	0.5	0.6	0.8	0.6	0.0	0.4	0.6	0.9	0.7	0.9

Source: JRC based on EU Survey 2022. Expert responses to: "Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral impact". The colour code indicates the largest magnitudes in green and the smallest in red, ranked for the overall set of values.

11 Experts' recommendations

The national summaries collected a set of general recommendations for developing national markets and specific recommendations on the financing domains (Annex 1).

11.1 Expert recommendations at the MS level

The national-level recommendations are organized in **Figure 27** into a) Promotion and exemplarity, b) Strategy and commitment, c) Technical assistance, d) Service provision and facilitation, e) Contract development and enforcement, f) Regulation and procurement, and g) Financing measures.

Financing measures were the most frequently cited dimension (20 MSs), mainly avoiding competition with EnPC, supporting projects and providing technical support.

- Avoiding high grant rates and using financing instruments instead was cited in 15 MSs (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Germany, Greece, Italy, Lithuania, Portugal, Romania, Slovakia, Slovenia and Spain).
- The need to establish or scale up guarantee funds and energy efficiency funds to lower the cost of financing was mentioned in 6 MSs, i.e. Austria, Belgium, Croatia, Czech Republic (to support refinancing further), Poland, and Romania).
- The introduction of incentives for EnPC was recommended in 6 MSs, including Denmark, Finland, Hungary (where EnPC eligibility for tax reliefs is unclear), and Spain. In Belgium, France and Germany, recommendations involved grant support to audits for projects' EnPC-ability and to cover provider costs.
- The use of EEOs, WhCs and CO2 taxation were also mentioned as opportunities in 4 MSs (Cyprus, Germany, Italy, and Spain).
- Technical support for setting refinancing mechanisms was also recommended in Romania and Portugal (and could be of interest to other MSs such as France), where refinancing would serve to overcome rules against the use of either EU or private funding.

Issues of contract development and enforcement were cited in 17 MSs.

- Most fundamentally, respondents asked for simpler, better-adapted contracts to the needs of clients and to address decarbonisation in 12 MSs, i.e. Austria, Croatia (buildings), Czech Republic (off-balance contracting), Finland (encompassing life-cycle savings), Germany, Ireland, Italy, Lithuania, Netherlands, Spain, Slovakia, and Sweden. For instance, there is a potential for developing contracts without maintenance (Slovakia and Czech Republic) and incorporating life cycle benefits to reduce return periods of contracts (Germany and Finland).
- There are issues of contract development for the public sector, guidelines and contract enforcement specific to MSs.
- Quality control receives the most attention in the domain of contracts' implementation. It was reported to require development in 7 MSs (Austria, France, Ireland, Italy, Poland, Romania and Spain). Establishing adequate monitoring and verification (M&V) standards and their implementation is very important because, without adequate them, EnPC loses its essence.
- The use of collaborative processes for contract and guideline development was recommended based on the experience in Germany and expectations in Sweden. Concerns about contract development support this argument without granting sufficient voice to the sector in other MSs.

The dimensions of Regulation and procurement, Service provision and facilitation, Technical assistance and Promotion and exemplarity were highlighted in 13 MSs. Regarding Regulation and procurement, the consulted experts identified the following recommendations:

- To overcome regulatory barriers in at least 7 MSs, i.e. Denmark, where off-balance contracting is not compatible with grants, France (third-party financing remains unclear in the public sector), Greece (procedures are unclear for EnPC), Hungary (eligibility of ESCOs for grants is unclear), Latvia (need of policy consistency), Poland (need of adequate transposition of the EED regarding article 18, and a potential to use EnPC in the application of Art. 5), and Portugal (where regulations do not permit the use of EnPC in public buildings).

- To improve the public administration and application procedures in at least 5 MSs, i.e. Belgium, Finland, Slovenia, Spain, and Lithuania. E.g. in Lithuania, there is a need to simplify the EnPC procedures in the PPP rules.
- To require the assessment of the EnPC-ability of projects and a need for long-term programming, recommended in 3 and 4 MSs, respectively.

Recommendations in the domain of service provision and facilitation were identified in 13 MSs. These involve:

- Market monitoring and the creation of a national registry of projects (11 MSs, i.e. Austria, Belgium, Croatia, Germany, Hungary, Italy, Lithuania – also including the monitoring of energy consumption –, the Netherlands, Portugal, Romania and Spain)
- The certification of services (5 MSs, i.e. France, Hungary, Italy – especially facilitation –, Slovenia and Sweden – both facilitation and provision).
- Addressing basic needs for the functioning of the market, including creating national ESCO associations (Croatia and Portugal) and creating lists of providers (Hungary and Poland).

Promotion and exemplarity encompass recommendations of information (7 MSs), demonstration projects, and the implementation of Art. 5 of the EED through EnPCs (6 MSs). In particular, the recommendations involve the following:

- To reach out to financing actors,
- To exploit the potential of demonstrating the EnPC in deep renovations, especially in central government buildings (Slovenia, Spain)
- To increase the informational focus on the benefits of EnPC beyond financing and energy saving (Ireland).

Strategic and regulatory development:

- To incorporate and clarify the role of EnPC deep renovation and decarbonisation,
- To strategically address the inclusion of new subsectors (e.g. central and other government buildings, public lighting, social housing, and DHC) in alignment with new EU targets and policy developments. Opportunities were identified for developments in buildings in Cyprus, central government buildings in Czech Republic, Slovenia and Spain, private sector in Denmark, commercial buildings (along with non-residential energy prices) in Lithuania, public buildings in Portugal, and residential and central government buildings in Slovenia.

Recommendations on developing technical assistance at the MS level were also highlighted in 13 MSs, i.e. Austria (to overcome federal administration barriers), Belgium, Cyprus, Estonia, Greece, Ireland, Italy, Netherlands, Romania, Slovakia, Slovenia, Spain, and Sweden. These recommendations include creating or upscaling national technical assistance facilities (and EGD facility), fostering collaboration between regional or federal authorities to meet energy-saving obligations (e.g. Austria, Spain), fostering aggregation, facilitation and one-stop-shops, and increasing the technical capacity of regions and municipalities.

Figure 27. Recommendations at MS-level

MS	Promotion and Exemplarity	Promotion, national level	Demonstration, exemplary	Strategy/ commitment	Regulation/ strategy for deep renovation/ decarbonisation	Commitment to energy efficiency	develop new subsectors	Technical assistance	National TA / Collaboration subnational authorities	Aggregation	Facilitation and one-stop-shops	Technical capacity of municipalities	Service provision and facilitation	National ESCO association	List of providers	Certified service	Market monitoring/ national registry of products	Contract development and enforcement	Simpler, adapted contracts, decarbonisation	Implementation contract, guidelines ...	Contract enforcement	Quality control, m&v	Mentoring and dialoguing processes	Regulation and procurement	Regulatory	Reduce administrative burden	EnPC-ability test/ funding conditional	Long term programming	Financing measures	Removal high grant rates- use of financing instruments	Guarantee fund- Energy efficiency fund	Incentives/ tax reliefs	EEOs-WhCs, CO2 tax	Refinancing			
Austria				●	●			●	●				●				●	●	●									●	●	●							
Belgium				●				●		●			●				●		●					●		●			●	●	●						
Bulgaria				●			●						●	●					●										●	●	●						
Croatia				●	●			●			●		●	●					●										●	●	●						
Cyprus	●		●	●	●			●			●		●					●	●	●		●						●	●	●				●			
Czechia	●		●	●			●						●					●	●	●		●						●	●	●							
Denmark	●	●		●	●		●						●					●	●	●		●			●			●	●	●				●			
Estonia				●				●	●				●						●						●				●	●	●						
Finland	●	●		●				●					●					●	●	●		●			●			●	●	●							
France				●	●			●					●			●			●					●		●			●	●	●				●		
Germany				●	●			●					●				●	●	●	●		●			●		●		●	●	●				●		
Greece	●	●		●				●	●	●			●					●	●	●		●			●			●	●	●							
Hungary	●			●		●		●					●		●	●			●					●	●			●	●	●				●	●		
Ireland	●	●		●	●			●		●			●					●	●	●		●						●	●	●					●		
Italy				●	●			●			●		●					●	●	●		●						●	●	●					●		
Latvia	●	●	●	●	●			●					●					●	●	●		●			●			●	●	●							
Lithuania	●	●		●	●	●		●					●				●	●	●		●					●		●	●	●				●			
Luxemburg				●				●					●						●										●	●	●						
Malta				●				●					●						●										●	●	●						
Netherlands				●	●			●	●			●					●	●	●		●							●	●	●							
Poland	●		●	●				●					●		●			●	●	●		●			●			●	●	●							
Portugal				●			●						●	●				●	●	●		●						●	●	●						●	
Romania	●	●		●	●			●				●					●	●	●		●						●	●	●							●	
Slovakia				●	●			●			●		●					●	●	●		●						●	●	●							
Slovenia	●		●	●	●		●	●			●	●	●			●		●	●	●		●			●			●	●	●				●	●		
Spain	●		●	●	●		●	●					●				●	●	●		●							●	●	●						●	
Sweden				●	●			●		●			●			●			●	●		●			●			●	●	●							
Sum	13	7	6	13	12	2	6	13	5	4	4	3	13	2	2	5	11	17	12	4	2	7	2	13	7	5	3	4	20	15	6	7	5	2			

Source: JRC, based on EU Survey 2021. Green circles indicate the recommendation is relevant in the MS. The colour scale indicates the recommendation dimensions from less (red) to more (green) frequency. Columns highlighted include additional information than the adjacent columns (on the right, inside the same solid box).

11.2 Expert recommendations at the EU level

The recommendations for EU policy-making and action are organized in **Figure 28** into a) technical assistance, b) strategic guidance; c) allocation and use of grants; d) promotion of the model; and e) information on the availability of funds and support.

The table shows that technical assistance, the allocation and use of grants, and promotion are the areas where recommendations were collected in most MSs (each was referred to in 13 MSs).

According to the information collected, several MSs would benefit from technical assistance, especially in the areas of project aggregation (8 MSs, i.e. Austria, Belgium, Estonia, France, Greece, Netherlands, Slovenia and Spain), and there are also calls for simpler and flexible application mechanisms from MSs with diverse contexts (Austria, Hungary, Slovenia) and specifically for setting facilitation and one-stop-shop capacities (France, Cyprus). This demand for technical assistance aligns with the appreciation towards the impact of these mechanisms presented in Section 11 (EU support).

A major interest in the allocation and use of grants occurs especially in MSs where grants are allocated to cover most of the investment (i.e. “high grant rate”) or are mutually exclusive with EnPC, off-balance contracting, or established mechanisms such as forfeiting. As a part of this support, there is a demand for further disseminating materials and knowledge on the national design and allocation of financing instruments as alternatives to grants (See, for instance, FI-Compass, 2020). In some MSs, support towards specific instruments was recommended, i.e. refinancing in Austria and Czech Republic, or guarantees, i.e. Belgium. Moreover, compulsory participation of private capital and studies of the suitability of the project for EnPC contracting were demanded in Bulgaria, Croatia, Germany, Romania and Slovenia). These reflections often referred to the allocation of Cohesion and NextGeneration Funds, which did not apply criteria about the multiplier effect of EU funds. There is an important demand from national experts, especially in MSs where the availability of financing limits clients’ interest in EnPC (Sweden, Netherlands). EU-level experts also identified the need to emphasize the benefits of EnPC beyond financing to include the technical quality and guarantees provided by the model.

Promoting the EnPC model at the EU level was often considered particularly necessary for financing actors (Greece, Ireland, Poland). These actors are understood in a wide array of MSs to be insufficiently familiar with EnPC and willing to support it (Section 5.2. Understanding and willingness of clients and financiers). As a part of this support dimension, the creation of a centre of excellence for the dissemination of good practices, exchange of experiences, and repository of projects was highlighted in 8 MSs, often recognizing the need to continue the efforts conducted in the framework of DEEP, EEFIG, CAEED, CAEPBD, and SEI Forum. There is also a need for Support on the certification and dissemination of providers’ and facilitators’ credentials (France, Slovenia).

Strategic support from the InvestEU Advisory Hub on the application of the model (9 MSs), which in the table includes the improvement and development of contracts (8 MSs) and the need of (re)defining EnPC (1 MS, i.e. Italy) refers to the need of assessing the role of EnPC in the strategic pursuit of long paybacks and decarbonisation targets. Multiple calls for simpler, more flexible contracting options adapted to the clients’ needs and the drive for decarbonisation were common amongst the consulted experts.

Increased efforts of information and clarification of the available EU support were also highlighted in 6 MSs (Belgium, Greece, Italy, Latvia, Lithuania, and Poland), often emphasising the need to make this information available both for providers and financing bodies, e.g. for the promotion or of allocation and use of grants and financial instruments supporting EnPC.

Figure 28. EU-level recommendations identified based on national experiences.

MS	TA more PDA	simpler, flexible	TA aggregation	TA facilitation/ one-stop-shops	Strategic guidance (1)	Simpler, flexible- adapted contracts: decarbonisation	Financing instruments vs grants...	...guarantees towards decarbonisation	...refinancing	...private capital compulsory	EnPC-ability test compulsory/ priority for support	Promotion of the model...	Centre of excellence, exchange of experience (2)	...certified services	Information on available support and funds
Austria	●	●	●		●	●	●		●			●	●		
Belgium	●		●				●	●				●	●		●
Bulgaria							●			●					
Croatia							●			●					
Cyprus	●			●	●	●									
Czechia	●						●		●						
Denmark									●			●			
Estonia	●		●												
Finland												●	●		
France			●	●		●	●				●	●	●		
Germany					●	●	●			●					
Greece	●		●				●					●			●
Hungary	●	●													
Ireland					●	●	●					●	●		●
Italy					●	●	●					●	●		
Latvia					●	●	●								●
Lithuania					●	●	●								●
Luxemburg															
Malta															
Netherlands	●		●		●	●						●	●		
Poland	●											●			●
Portugal	●						●								
Romania							●			●					
Slovakia	●				●										
Slovenia	●	●	●				●			●		●		●	
Spain	●		●									●	●		
Sweden												●		●	
Sum	13	3	8	2	9	8	13	1	2	3	2	13	8	3	6

Source: JRC, based on EU Survey 2021. Green circles indicate the recommendation is relevant in the MS. The colour scale indicates the recommendation dimensions from less (red) to more (green) frequency. The highlighted columns summarize recommendations for one dimension and can include recommendations in addition to those in the columns on their right, which highlight specific recommendations in the dimension. (1) Refers to strategic support from the European Investment/ InvestEU Advisory Hub / Strategic guidance on the application of the model, use of financing instruments, pursuing long paybacks and decarbonisation. (2) Refers to creating a centre of excellence/dissemination best practices (DEEP, EEFIG)/ repository/ exchange CAEED, CAEPBD and SEI forum.

12 Report conclusions about the EnPC markets of the EU

Continuing the decades-long developments, EnPCs offer energy efficiency and performance improvements solutions, thus benefiting end-users, Members States' economies and providers alike. This report thoroughly reviews the status and future development of EnPC markets in the EU. Previous JRC reports reviewed the public sector EnPC markets (2017 and 2021) and the ESCO markets in the EU (2005, 2007, 2010, 2014, 2017, 2019). The current report continues the past assessments using the same methodology, which includes extensive surveying and data collection and direct interviewing of experts, who were requested to review draft versions of the report for the highest consistency and reconcile conflicting views by different market players.

12.1 Market monitoring and trends

A general lack of national data and databases on ESCO indicators (such as numbers of market players, ESCOs and EnPC providers) was identified. Some exceptions are France, Germany and Spain. In France, the public sector EnPC contracts are monitored and reported by ADEME. In Germany, DENA reviews the market penetration of energy contracting modalities and can capture the EnPC reality of the federal states. MS-level organisations in the Netherlands, Spain and Germany collect market data based on responses from ESCOs. It is a challenge to extrapolate these responses to the whole market, considering the lack of information on the non-respondents. National reports on energy services are unclear about the relevance of EnPC within the wider energy services markets (Germany, the Netherlands and Spain). Whilst the best source of data available for this report series continues to be expert estimates, a registry of contracts is needed to make market monitoring reliable.

The public market could be twice to four times the size of the private market in terms of annual investment (€1.9-4b in contracts, and €1-1.1b, respectively, signed in the public and private sectors in 2020-21). There is continued potential for the public sector to lead market development. The private sector's activity as an EnPC client is still sizeable, and in some MSs, the private sector leads the market. There is a sizeable group of MSs where the public sector could lead the market to take off when alternative contracting modalities without verified and guaranteed savings could be gaining momentum in energy saving and decarbonisation markets. The public sector could lead by developing and publishing contracting and intervention models that they successfully use. Public clients could also provide the right signals to mainstream the Energy Efficiency First principle and the commitment to EU targets of saving energy and decarbonisation.

The study of market size evolution and trends observed (**Figure 29**) indicates that:

- There has been general growth in the EnPC market since 2016, with some MS exceptions. Exceptions are Slovenia and Slovakia (after uncertainty on the treatment of EnPC in public accounts was back to growing in the period 2020-21), Finland, Sweden (in both Finland and Sweden, there is limited public sector interest), Latvia and Lithuania (the latter two markets are having difficulties to take off). Developments and take-off in smaller markets in some MSs also indicate a consolidation of the EnPC model, e.g. in Cyprus.
- The expert assessment of the trend during 2020-21 indicates that EU private markets grew but failed to take off or contracted in several MSs. Activity increased in 9 MSs, i.e. Belgium, Cyprus (1-3 small projects), Finland, France, Hungary, Ireland, Poland, Romania, Slovakia, and Slovenia. The markets remained stable in 6 MSs: Austria, Denmark, Germany, Italy, Netherlands, and Spain. On the other hand, EnPCs failed to take off in 6 MSs, namely in Portugal, the Czech Republic, Greece, Lithuania, Sweden and Bulgaria; and markets contracted in Croatia and Latvia.
- EnPC markets in the public sector have generally grown across Europe. They expanded in particular in 7 MSs: Belgium, Czech Republic and Slovenia, Austria, France, Greece, and Germany. According to some experts, the Hungarian public market is taking off.
- The market was stable and low (or did not take off) in 10 MSs, i.e. Bulgaria, Denmark, Finland, Greece, Ireland, Lithuania, Poland, Cyprus, Malta and Romania (the latter three failed to take off). In Malta, the government decided to reduce its support for developing ESCOs to reflect the lack of uptake previously. This shows that ESCOs might not be compatible with all policy systems. Of note, the market contracted in 7 MSs markets assessed as developed or having a good perspective for development in previous JRC reviews, i.e. Croatia, Czech Republic, Italy, Latvia, Portugal, Slovenia, and Sweden.

Figure 29. Market trends based on expert survey for 2019 - 2021 and 2022-2024.

	Private	Public	Private	Public
MS	2019-21	2019-21	2022-24	2022-24
Austria	→	↗	↗	↗
Belgium	↑	↑	↑	↑
Bulgaria	→	→	↗	↗
Croatia	↓	↓	↓	↓
Cyprus	↗	→	↗	↗
Czech Republic	→	↑	↗	↑
Denmark	→	↓	↗	↗
Estonia	↓	↓	→	→
Finland	↗	→	↗	↗
France	↗	↗	↑	↑
Germany	→	→	↑	↑
Greece	→	↗	↗	↗
Hungary	↗	↗	↗	↗
Ireland	↗	↗	↑	↑
Italy	→	↘	↗	↗
Latvia	↘	↘	↗	↗
Lithuania	→	→	→	↗
Luxemburg	→	→	→	→
Malta	→	→	→	→
Netherlands	→	→	↗	↗
Poland	↑	→	↑	↑
Portugal	→	↓	↗	↗
Romania	↑	→	→	→
Slovakia	→	↗	↗	↗
Slovenia	↗	↑	↗	→
Spain	→	→	↑	↑
Sweden	→	→	→	→
EU Estimates	↗	↗	↑	↗
EU Sum				

Source. JRC, based on EU Survey 2022, JRC 2021, JRC 2019, and JRC 2017. The arrows indicate a green "upward", in yellow diagonal "taking off" or "growing", in yellow horizontal "stable", and in red "downward".

Further growth is expected for future trends between 2022 and 2024, especially for private markets (Error! Reference source not found.). This can be driven by growing energy prices, reputational gains in taking climate mitigation action, and specialisation in private actors' core business activities. Also, there is a risk of the public sector losing momentum after leading the market's development and the adoption of EnPCs on the side of the private sector. Trends in the public and private sectors of MSs are generally aligned, and there are minor differences in Czech Republic, Lithuania, and Slovenia. Some of these trends are further analysed:

- The **clearest positive trends were forecast for 8 MSs** Belgium, Czech Republic (public market especially), France, Germany, Ireland, Poland, Slovenian (private market especially), and Spain.
- **Expectations for take-off were reported for 3 MSs**, i.e. Romania, Sweden and Cyprus.
- **Market contraction was only reported for Croatia** (both public and private sectors).

Market uncertainty was reported in several MSs as related to policy and strategic development. Several national market perspectives largely depend on the implementation of the Resilience and Recovery Plans (RRPs). These support EnPC in Austria, the Wallonian part of Belgium, Croatia, Czech Republic, Poland, Slovakia and Slovenia. Additionally, RRP may become more closely related to EnPCs in some MSs for which the European Commission has recommended using the EnPC model (reported for Greece, Ireland and Denmark). Uncertainty about the perspectives of EnPC remains due to the commitment of MSs to achieving EU decarbonisation targets, energy price dynamics, developments in the industry and the adoption

of renewable technologies and the system's electrification.⁶⁵ These factors may result in new opportunities for EnPC or a preference for other contract modalities (e.g. EEaaS).

The sufficient availability and quality of providers, facilitators and financing actors appear highly related to market developments in MS. In particular,

- There remains a constant need for quality assurance, both for providers and facilitators, through training and certification, official lists of providers (e.g. Italy), and training and certification of facilitation services (Italy, Spain, and Ireland).
- There appear to be positive developments in the availability of financing. To an uncertain extent, this can be related to the availability of public financing instruments providing liquidity for green financing. However, the availability of private financing actors and other actors willing to work with EnPC also depends on the availability of grants competing with EnPC.
- Awareness raising and information specifically addressed to financing actors continue to have a potential (Italy, Poland, Hungary, Portugal and Slovenia).
- To overcome capacity and information barriers, there is continued widespread potential for developing one-stop shops with the capacity to support EnPC markets. These services are particularly appraised positively in Finland, Germany and Italy.

The review of market modalities shows that EnPC with guaranteed savings is slightly most common in the public sector. It is most widespread in Austria, Belgium, Croatia, Denmark, Slovenia, Slovakia, Finland, Greece, and Poland. In Czech Republic, a widespread model combines guaranteed and premium shared savings. Shared and guaranteed savings are of similar relevance in the private market of EnPC at the EU level. Shared savings is the preferred EnPC model in the public sector of Bulgaria, Italy, Spain, and Portugal, and it shares the market with guaranteed savings in Slovakia. In addition to expectations generated by regulatory and EU-funding developments, which may have slowed down during the period, affordable financing, guarantees, and refinancing guarantees are key for developing off-balance possibilities.

Two major contracting modalities compete with EnPC:

- a) Simpler energy service contracting models with lesser guarantees, such as EEaaS, which are advantageous for their simplicity, can be off-balance in private clients' accounts and can integrate on-site renewable generation without the restrictions of Eurostat guidelines (maximum 50% savings from renewables).⁶⁶
- b) Conventional contracts of works, often with the support of EU grants, are common in Croatia, Cyprus, Bulgaria, Poland, Romania, Czech Republic, France, Germany and Spain.

Future developments may involve widening or narrowing the sectoral scope of EnPC contracts. In both cases, clarification and communication of the advantages of EnPC are needed.⁶⁷

12.2 Project characteristics

The largest project sizes were reported in France, Denmark, Belgium, Greece, Slovenia, and the Portuguese private sector (contracts above €3m), driven by requirements of scale in ELENA and providers. In public lighting, smaller contracts around €1m continue to be common (e.g. Croatia). There are several MSs where contracts in the private sector are gaining the same or larger scale than the ones in the public sector (Belgium, Finland, Denmark, Ireland, and Portugal). Project duration varies across markets depending on the depth of intervention, availability of financing and subventions for long-payback interventions, and energy

⁶⁵ Regarding renewables, the previous JRC report on EnPC markets (Moles-Grueso, et al. 2021) identified an untapped potential in combining revenue streams from on-site renewables and energy efficiency interventions in buildings to strengthen the viability of the EnPC model, continued efforts to exploit the potential in standardisation to equalize risks between energy efficiency and renewable portfolios are needed. Regulatory, financing and strategic developments will determine the extent renewables are introduced as part of integral interventions using EnPC or are introduced using other contract modalities.

⁶⁶ In combination, this restriction and the increasing market interest in renewables are barriers to EnPC. It must be highlighted that these restrictions are important to ensure that the Energy Efficiency First principle is considered by clients pursuing off-balance settings and allocating public funds.

⁶⁷ Refers to building performance contracting models which incorporate user benefits – e.g. real estate value –, life-cycle and carbon savings as proposed by providers in Belgium, Sweden, and Germany – and contracts which separate energy performance works with short paybacks but verified savings from deep renovations, with longer payback.

prices. Long paybacks above 12 years are common in the public sectors of Denmark, Poland, Slovenia, Czech Republic, German, Netherlands, Latvia, and Lithuania. Different percentages of baseline consumption continue to be related to the type of interventions. Most interventions in buildings attain 25-30% of savings over the baseline. Larger savings are attained in deep renovations (40-50% savings) – common in Lithuania and Latvia – but these market options are less successful and require specific support from public funding. Savings in public lighting attain the largest savings – 85% in Croatia and 70% in Spain and Portugal. The contracted savings in buildings are challenging for the EnPC model due to pressing decarbonisation targets, as in the case of France, where interventions in the private commercial sector are expected to be required to achieve 40% savings (above current savings of 30%) and ESG commitments. Expert estimates in the domain of private buildings are most diverse and indicate a potential for monitoring, both to policymakers and for financing actors and providers to assess risks.

Public buildings, followed by public lighting, continue to be the most frequent type of project in the EU. The third most common type of interventions are private buildings (mainly commercial, but residential is of relevance in some MSs, e.g. Latvia), and then interventions in the industry. Follow, in decreasing order of relevance, projects bundling different types of interventions (public buildings and lighting), district heating, and smart grids, which alongside e-mobility, have interest in some MSs and are expected to gain relevance. Project aggregation is key for projects to develop in several MSs, especially when public authorities of small size lack the scale to engage with EnPC and hence need technical assistance, mostly provided by the EU (ELENA).

The most common types of interventions in buildings continue to be the replacement of specific elements, and on-site renewable generation is gaining momentum, especially in private buildings. Moreover,

- Building management systems and Demand flexibility and storage are gaining relevance.
- Deep renovations are relevant only in a few MSs because these interventions require integrating client or public support funds to address the interventions with long paybacks (envelope). Deep renovations are of the utmost relevance in a few MSs, but these are not always reflected in high savings rates (exceptions are Latvia and Lithuania).
- Maintenance tends to be also an element of EnPCs, as it is becoming the integration of building management systems (highlighted Belgium, Czech Republic, Ireland, Slovenia, and Spain).
- EnPC interventions of demand flexibility and storage are gaining relevance. These were reported as relevant in Ireland, Italy, and Lithuania, and there are expectations in Denmark and Bulgaria and the large industry of the EU.
- There is a trend towards integrating new technologies and exploiting sectors not developed in the past in MS-specific contexts (private buildings, public buildings, central government buildings, industry).

Fundamentally, exploiting new technological and sectoral potentials needs not to disregard the need for deep interventions in buildings and integration of district efficiency and generation capacity) to align with EU and MS strategic goals of saving energy and decarbonising consumption, largely to avoid locking in the potential for deeper interventions.

12.3 Barriers and drivers

Comparison between the 2019-21 and the 2022-24 periods shows a marginal reduction in the presence of several barriers besides grant competition and a singular increase in the number of drivers. Concerning barriers,

- Competition with investment subsidies is widespread and increasing with the allocation of funds in the RRP. Several MSs have limitations or difficulties in combining grants with EnPC (e.g. Croatia, Poland, Portugal) or its off-balance options (e.g. Slovakia).
- Other barriers highlighted in most MSs are knowledge and expertise of clients (10 MSs), trust in the model (6 MSs), and complexity of the model (9 MSs); debt treatment (7 MSs), lack or affordable financing for providers (8 MSs), integration of decarbonisation (8 MSs), policy commitment (11 MSs), Legal and procurement (14 MSs for 2019-21 and in 9 MSs for 2022-24); administrative burden (6 MSs), and policy uncertainty, often related to the implementation of the RRP (11 MSs).
- Structural barriers of subsidised energy prices, market size and administrative division, and an earlier collection of low-lying fruits are also key in a series of MSs.

- Besides increasing energy prices since 2021, EnPC appears to be driven by the EU strategic and regulatory developments, sectoral capacities (e.g. stabilised trust and increased interest), which have largely developed through technical assistance and providers' activity, and a combination of EU and national support to the model. Technical assistance (especially ELENA and Horizon 2020/ Horizon Europe) was widely appreciated as the most impactful EU supporting mechanism in most MSs.
- There are increasing expectations for the EU regulatory framework and strategies to improve the situation of the EnPC market for driving investment towards buildings by fostering decarbonisation, using Energy Efficiency Obligations and White Certificates, and increasing national and EU support.

The EU energy saving and decarbonisation targets are key drivers and foster the development of simpler contracts and an alternative to EnPC (such as EEaaS). There is a risk that deep interventions and EnPC will lose momentum. Some causes are the slow progress at the national level regarding regulatory updates, the development of contracts and guidelines, the introduction of technical support and information instruments, procurement and tendering rules, and the use of EnPC by public bodies. Other causes are the Covid pandemic and a wait-and-see stance taken by some MSs related to the ongoing transformation of the EU regulatory and financing framework during the years 2020-2021., aligning with expected developments in the EED recast whilst stepping up efforts in central government buildings and as a part of their exemplary role.

In compliance with Art. 18 of the EED (2018), adequate market monitoring, support and removal of regulatory barriers continue to fall short of expectations in multiple MSs. It is necessary to foster the EnPC market and assess its multiplicative factor of EnPC to achieve savings and engage the private sources of financing. Developing technical assistance mechanisms and one-stop-shops continues to rely on EU technical support, which sectoral experts highly appreciate. These are key in an increasingly complex legal and financing framework to overcome the complexity, financing, scale and trust issues surrounding EnPC contracting. Hence, further national commitment and developing national capacities in these domains were expected in the reported period but did not occur to the extent expected.⁶⁸

12.4 Balance treatment of EnPC in clients' accounts

Uncertainties about the Eurostat treatment of EnPC in government accounts caused market stagnation in previous years. In 2019-21 the development of off-balance contracts has brought attention towards EnPC in several MSs. Nowadays, there is a reported existence of off-balance contracts in 17 MSs. However, the number of off-balance contracts signed in the EU is estimated to be relatively low, at around 8%, well beyond the average of national estimates. Only a few projects have been reported and officially approved by Eurostat. The Covid pandemic largely contributed to slowing down or halting the development of off-balance model contracts. Several existing model contracts have been reviewed as needing adaptation to the changing context. Demands for adaptation and update largely refer to the need for simpler, flexible models to address decarbonisation needs. However, this is not easy within the compliance framework with off-balance contracting set by Eurostat.

In addition to the national development of Eurostat-compliant models, at the subnational level, national budgetary rules impose debt liabilities to regional and local authorities in at least 4 MSs. Also, the private sector is increasingly interested in off-balance treatment according to the IRFS standards. Aligning with the recommendations collected (section 11), there is a need for closer monitoring of the EnPC market and support for contracts to align with debt concerns and EU strategic goals of saving energy and decarbonising buildings.

Fundamentally, revisions to EnPC contracting models and support from public institutions are made in the sight of the priority that needs to be granted to energy efficiency as a guiding principle.

⁶⁸ For instance, one-stop-shops are considered to be most insufficiently deployed in Bulgaria, Ireland, Poland, Portugal, Slovenia, Spain, Sweden, and to an extent Croatia.

13 Recommendations for MSs

The national-level recommendations are organised along the topics of a) Financing, b) Development of model contracts for the public sector; c) Public procurement regulations and administration; d) Contract implementation and evaluation; e) Promotion and exemplarity; f) Strategic and regulatory development, and g) Technical assistance.

a) Financing

Fundamentally, MSs need to avoid using high grant rates that deter the participation of private investment, e.g. through EnPC, in energy efficiency projects, reducing the leverage of public funds. The use of public funding can be better allocated through:

- Incentivising EnPC, e.g. audit support, support to eligibility studies, conditional eligibility for grants, subsidies and tax reliefs.
- Supporting only investments with long return periods (e.g. interventions on the envelope) complementary to the EnPC model.
- Establishing or scaling up guarantee and energy efficiency funds to support access of providers to financing and refinancing – this is key for the development of the market and, in particular of off-balance projects, which can be particularly attractive to a diversity of clients, and could benefit from funds from the RPPs, EEOs, WhCs and CO2 taxation.
- Setting up refinancing mechanisms.

b) Development of model contracts for the public sector

In the public sector, there is a continued need to develop and adapt models to the national context as a part of efforts to make contracts simpler through stakeholder involvement.

- Continued contract adaptation to sectoral characteristics (public buildings and lighting) and consider the potential for integrating decarbonisation, life cycle benefits and country-specific needs (e.g. aspects about including maintenance and renewables).
- Unilateral adoption of contract modalities on the central government's side needs to be avoided because it risks jeopardising the development of EnPC markets.
- Development of EnPC models in coordination with public financing authorities and alongside strategic policy development. This is important to clarify the scope of EnPC interventions and the support expected from public and private sources on complementary interventions (e.g. envelope renovations – which benefit from public support due to long return periods – the installation of renewables – attractive to private financing for their short return periods). Long-term strategic programming for investments in the public sector and support to the private sector is needed for providers and clients to have the capacity to draft EnPC projects and contracts.

c) Public procurement regulations and administration

In application of Art. 18 of the EED, there is a need for policy improvements for consistency and clarity in the regulatory, financing and administrative domains for these not to act as barriers to EnPC. Action in this domain may involve different MSs to address financing compatibilities between grants and EnPC, eligibility of energy service providers for grants, the use of third-party financing in the public sector, and restrictions on using EnPC in the public sector or its buildings. In addition, public sector regulators should consider the advantages of:

- Introducing requirements for assessing project EnPC-ability at the preliminary stages of the procurement process.
- Long-term strategic programming is needed for both providers and public sector managers to plan for the use of the EnPC model; otherwise, rushed allocation of funds results in a preference for contract modalities that are less complex but fail to provide the advantages of EnPC in terms of financing and guarantees.
- Aligning with the revision of Article 6 on Purchasing by public bodies in the proposal for a recast of the EED, to rely on initiate development of green procurement guidelines and technical support (see point on technical assistance) for integrating the energy efficiency first principle in public procurement and taking especial stock on the potential encouraging aggregated procurement.

d) Monitoring and supporting the business environment

The development and update of EnPC guidelines, contract enforcement, quality control, and M&V continue to have potential in several MSs. As in the case of contract development, this requires considering the needs and

expertise of various stakeholders. There is a potential for most MSs to monitor the market and support its capacity development whilst increasing transparency and trust in the EnPC model:

- A few MSs need the creation of ESCO associations and a list of ESCO providers (in fulfilment of Art. 18)
- Most MSs would benefit from a national registry of EnPC projects and a listing of service providers and facilitators specialised in the provision of EnPC.
- MSs could either directly or through professional (ESCO) associations introduce certification mechanisms for service providers and provide training for facilitators – this would ease the consolidation of the lists of qualified operators indicated.
- MSs could collaborate with the financing sector to develop the latter's capacity in green financing, particularly EnPC – this could be achieved through collaboration in EU projects, the development of one-stop shops and activities of knowledge exchange between the EnPC sector and the financing sector.
- In alignment with Article 21 of the proposal for a recast of the EED, there is an opportunity for MSs to establish mechanisms for handling complaints and for the out-of-court settlement of any dispute arising.

e) Promotion and exemplarity

There is a continued need for tailored information to address both clients and financing actors for these to understand better the benefits and risks of EnPC, in particular, to understand that the advantages of EnPC reach beyond financing and that it is a mechanism intended for energy efficiency improvements of short to mid-term return periods. (Hence clarifying that investment in renewables is a possible but not a core part of EnPC - but a match as accepted in the EIB and Eurostat guidelines for the off-balance treatment of EnPC investment in public accounts – and that envelope interventions need specific financing sources.) Increased attention to this domain holds a potential for the development of EnPC in sight of the proposal for a recast of the EED, which involves the extension of exemplary requirements to all public bodies' buildings. Moreover, public bodies can contribute to normalising EnPC by using this mechanism in implementation of provisions proposed in the EED recast for the public sector to apply the Union's green public procurement criteria in the domains of data centres and public lighting amongst others. Through these means, it is fundamental that MS governments and public bodies engage and send clear signs to the financing sector about their commitment to EnPC and its role of EnPC in meeting energy efficiency and decarbonisation targets.

f) Strategic and regulatory development

Strategic alignment with the targets and requirements set by the EC in current and upcoming policy developments and financing support (in the domains of deep renovation, decarbonisation and energy efficiency) would benefit from prioritising EnPC as a mechanism that provides performance guarantees, enables a multiplier effect of public funds, and addresses the Energy Efficiency First principle. This is important to avoid the risks of picking the low-lying fruits provided by renewable technologies and locking in the energy efficiency potential. It holds a potential for fulfilling Energy savings obligations, which the proposal for the recast of the EED increases to an annual obligation of 1.5% for all MSs whilst prioritizing actions in vulnerable dwellings. Moreover, strategic development should consider the exploitation in sectors with an unexplored potential that is not being developed, e.g. in MSs with the sectoral capacity to work with EnPC, such as Portugal and Croatia, where public buildings continue to have a potential for EnPC development. Following up on this strategic development, addressing regulatory consistency and clarity aspects is necessary to reduce policy uncertainty, project preparation, and administration costs.

g) Technical assistance

EU-level technical assistance continues to be a most appreciated instrument of EU support for developing EU markets. There is an unexplored potential for the creation of national and regional capacities, one-stop shops, and technical assistance facilities for assisting with project drafting, contract development and aggregation of projects, and training to public and private clients, as well as to financing bodies, potentially in coordination with technical assistance facilities of the EU which reflects on the demands of national experts and the relevance granted to these instruments in the proposed recast of the EED. One-stop-shops and other technical assistance facilities should create a network to collaborate in project preparation, exchange experiences and contribute to regulatory consistency and harmonisation amongst national authorities – the latter is particularly necessary in federal MSs and others with devolved attributions to regions and local authorities. The development of these national capacities, alongside financing guarantees, is key for exploiting the

potential of sectors which, having potential, are not consolidated depending on MS-specific contexts, including social housing and aggregated projects of private residential buildings, whose relevance is being furthered in EED and EPBD recasts. Improving the technical support to public bodies would be in alignment with the requirements on MSs included in the proposal for revision of Art. 5 on public purchasing in the recast of the EED and which holds a major potential for aggregating projects to be handled as EnPCs.

14 Recommendations for the European Institutions

There is a major potential for EU institutions to continue collaborating with MSs in communicating the scope of EnPCs, as focused on energy efficiency investments with short-to mid-term return periods. The Eurostat Guidance on public debt treatment of EnPC created expectations for boosting EnPC market development. The Covid pandemic contributed to halting a dialogue on the necessary adjustments to attain off-balance treatment and allocating efforts to develop model contracts. The current interest in renewables has resulted in a lower interest of clients for efficiency and frustration related to the complexity and limitations introduced concerning including renewable generation in EnPC projects. Hence, communication on the scope of EnPC and the options available to combine it with other interventions is key to avoid frustrating inaccurate expectations on EnPC. Eventually, concerns about the treatment of EnPC as public debt are more problematic at the intra-national level and should be clarified. The EU-level guidance could serve as a model for some central governments to reconsider their budgetary limitations on regional and local authorities.

Members states would benefit from support and publicity to efforts of market monitoring, establishment of lists of EnPC providers, and training and certifying providers and facilitators. It would support the success in these domains, the creation of national associations in several MSs, and the EU-level efforts towards adopting M&V standards such as the IMVP.

Moreover, market monitoring at the MS level would gain leverage with increased efforts on communicating the EnPC experiences and potential through EEEFIG, DEEP, CAEED, CAEPBD, and SEI Forum. This would serve providers and financing actors to assess risks and the most suitable intervention typologies. This could set the grounds for creating a centre of excellence on EnPC for disseminating good practices, exchanging experiences, and creating a repository of projects.

There is a need for continued and strengthened strategic support from the InvestEU Advisory Hub to MSs on the development of contracts whilst assessing the suitability of EnPC and other models to tackle the potential for deep renovations of buildings and pursue energy saving and decarbonisation targets. These efforts should explore and bring together the multiple experiences developed with the support of Horizon 2020/ Horizon Europe programs which have worked on developing a wide array of contracting and financing models within and beyond the boundaries of EnPC and off-balance contracting.

Guiding the national allocation of Structural and Investment Funds (2014-20), Cohesion Policy Funds (2021-27) and the Recovery and Resilience Facility funds to avoid these competing or being incompatible with EnPC and complement the investments made through the latter model. This is important to achieve a multiplier effect of EU funds, contributing to achieving pressing targets of energy saving and building decarbonisation. In particular, it would be advisable:

- The introduction and strengthening of EC guidelines on the use of EU grants (e.g. for these to focus on investments with long return periods, complementary to those addressed by EnPC), the introduction of allocation criteria on the achievement and demonstration of savings (like those in ELENA), and dissemination of financing instruments as alternatives to direct allocation of subsidies – especially with high grant rates – are advisable.
- A focus on support to MSs in setting guarantee mechanisms and refinancing capacities could help MSs allocate funds in ways that attain a multiplier effect of public funding whilst increasing the capacity of EnPC providers and reducing risk perception.

The EC and the EIB's efforts of disseminating the EnPC model need to continue to emphasise the benefits of EnPC beyond financing to include the technical quality and guarantees provided by the model. Otherwise, persistent understanding of EnPC as a financing mechanism results in frustration when clients with insufficient technical means face a more complex than expected instrument. In the domain of information, it is also fundamental that more information and clarification of the available EU support is made available to providers and financing actors. Collaboration in this domain would help MSs to fully implement the requirements of the EED Article 18, with a focus on EnPC and expected developments in this domain as put forth in the upcoming recast of the EED.

Relying on the success and demand for Technical assistance and Project development assistance, there is a potential for the EC to continue and strengthen these in the areas of project aggregation, setting technical assistance facilities at the MS level that replicate the success of ELENA at the national level, setting regional and national coordination offices, setting up one-stop-shops, and training of facilitators. Support for individual

projects would benefit from simpler and more flexible application mechanisms to reduce the costs for some applicants.

There is a continued need to address financing actors and authorities by promoting the model and engaging them in the processes mentioned in these recommendations (e.g. market monitoring, exchange of experiences, and contract development).

References

- Boza-Kiss, B., and P. Bertoldi, One-Stop-Shops for Energy Renovations of Buildings, JRC European Commission, 2018.
- Boza-Kiss, B., A. Toleikytė, and P. Bertoldi, Energy Service Market in the EU - Status Review and Recommendations 2019, Vol. EUR 29979 EN of Scientific and Technical Report. European ESCO Market Reports Series, European Commission, Luxembourg, 2019.
- Boza-Kiss, B., P. Zangheri, P. Bertoldi, and M. Economidou, Practices and Opportunities for Energy Performance Contracting in the Public Sector in EU Member States., 2017.
- BPIE, Deep Renovation: Shifting from Exception to Standard Practice in EU Policy, 2021.
- Bruegel, European Union Countries' Recovery and Resilience Plans, December 14, 2022.
- CAN, Position Paper on the Energy Efficiency Directive Recast, November 23, 2021.
- EC - European Commission, Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 Amending Directive 2012/27/EU on Energy Efficiency, 2018.
- , REPowerEU Plan. Communication from the Commission to the European Parliament, the European Council, the Council, COM/2022/230 Final, 2022.
- Economidou, M., V. Todeschi, and P. Bertoldi, Accelerating Energy Renovation Investments in Buildings: Financial and Fiscal Instruments across the EU., 2019.
- EEFIG, Report EEFIG, 2021.
- EIB, 'EIB Projects', 2023. <https://www.eib.org/>.
- European Commission, ANNEX Accelerating Clean Energy in Buildings, 30.11.2016.
- , Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Renovation Wave for Europe - Greening Our Buildings, Creating Jobs, Improving Lives, 14.10.2020.
- , Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Stepping up Europe's 2030 Climate Ambition. Investing in a Climate-Neutral Future for the Benefit of Our People, 17.9.2020.
- , COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Strategy for Financing the Transition to a Sustainable Economy, COM/2021/390 Final, 2021.
- , Europe's Moment: Repair and Prepare for the Next Generation, 27.5.2020.
- , Horizon Europe, nd.
- , Proposal for a Directive of the European Parliament and the Council on the Energy Performance of Buildings (Recast), COM(2021) 802 Final, 15.12.2021.
- , Questions and Answers on the Renovation Wave, Brussels, October 14, 2020.
- , 'What Is Horizon 2020?', nd. <https://wayback.archive-it.org/12090/20220124080607/https://ec.europa.eu/programmes/horizon2020/what-horizon-2020>.
- European Commission, Directorate General for Energy., Report on the Evolution of Financing Practices for Energy Efficiency in Buildings, SME's and in Industry: Final Report., Publications Office, LU, 2022.
- European Commission. Directorate General for Energy., COWI., Climate Strategy., d fine., EEIP., EnergyPro., Fraunhofer ISI., ICCS NTUA., and Viegand Maagøe., Report on the Evolution of Financing Practices for Energy Efficiency in Buildings, SME's and in Industry: Final Report., Publications Office, LU, 2022.
- European Commission. Joint Research Centre., EU Challenges of Reducing Fossil Fuel Use in Buildings., Publications Office, LU, 2021.
- European Commission, Joint Research Centre, National Energy and Climate Plans for 2021-2030 under the EU Energy Union: Assessment of the Energy Efficiency Dimension., Publications Office, LU, 2020.

European Commission. Joint Research Centre., Progress of the Member States in Implementing the Energy Performance of Building Directive., Publications Office, LU, 2021.

European Energy Efficiency Platform (E3P), 'Energy Performance Contracting', 2020. <https://e3p.jrc.ec.europa.eu/articles/energy-performance-contracting#toc-1>.

European Parliament and Council of the European Union, Directive 2012/27/EU of the 25 October 2012 on Energy Efficiency, Official Journal of the European Union, Vol. L 315/1, Vol. L 315/1, 14.11.2012.

———, Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 Amending Directive 2010/31/EU on the Energy Performance of Buildings and Directive 2012/27/EU on Energy Efficiency (Text with EEA Relevance), 156, Vol. OJ L, Vol. OJ L, 19.6.2018.

European Parliament and the Council, DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources (Recast), 21.12.2018.

———, Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as Regards the Promotion of Energy from Renewable Sources, and Repealing Council Directive (EU) 2015/652, 14.7.2021.

Eurostat, Eurostat Guidance Note - The Recording of Energy Performance Contracts in Government Accounts, 19.9.2017.

Eurostat and EIB, A Guide to the Statistical Treatment of Energy Performance Contracts, 2018.

Fi-Compass, European Structural and Investment Funds (ESIF) and Energy Performance Contracting (EPC), EIB, European Commission, 2020.

Fi-Compass, The Potential for Investment in Energy Efficiency through Financial Instruments in the European Union, 2020.

Funcas, An Analysis of the European Commission's Guidelines on the Recovery Fund, October 2020.

Housing Europe, Impact of the Recovery Plans on the Social and Affordable Housing Sector, November 24, 2021.

IFRS, IFRS - IFRS 16 Leases, January 1, 2019.

Launch Project, D4.6 Report on SEAD Business Models and End-Customer Segmentation, November 6, 2020.

Moles-Gruoso, S., P. Bertoldi, and B. Boza-Kiss, Energy Performance Contracting in the Public Sector of the EU: 2020., Publications Office, LU, 2021.

Pernetta, R., and L. Bender, 'EIB Update on EPC Models and EPC Financing for Comprehensive Renovation', presented at the CA EED webinar - EPC as a catalyst for renovation of public sector buildings, Online, April 28, 2020.

QualitEE Project, Guidelines for European Technical Quality Criteria for Energy Efficiency Services, 2020.

Rodrigues, D., 'EIB Support to the ESCOs/EPCs Market', presented at the ESCO Conference, Frankfurt, October 5, 2022.

Schenk, C., 'Energy Efficiency in Emerging Economies', presented at the European ESCO Conference, Frankfurt, October 5, 2022.

Vlaams EnergieBedrift, 'VEB ELENA', 2022. <https://www.veb.be/elena>.

Zangheri, P., M. Economidou, and N. Labanca, 'Progress in the Implementation of the EU Energy Efficiency Directive through the Lens of the National Annual Reports', *Energies*, Vol. 12, No. 6, March 21, 2019, p. 1107.

List of abbreviations and definitions

b	billion
DHC	District Heating and Cooling
BOOT	Build-own-operate-transfer
CAPEX	Capital expenditure ⁶⁹
EC	European Commission
EE	energy efficiency
EED	Energy Efficiency Directive (Directive 2012/27/EU as amended by Directive 2018/2002/EU)
EEO	Energy Efficiency Obligation
EPBD	Energy Performance of Buildings Directive (Directive 2010/31/EU as amended by Directive 2018/844)
EnPC	Energy Performance Contract(ing) ⁷⁰
ES	Energy services
ESC	Energy Service Contracting (also used elsewhere for Energy Supply Contracting)
ESCO	Energy Service Company
IEC	Integrated Energy Contracting
JRC	Joint Research Centre of the European Commission
JRC 2017	Boza-Kiss, B., A. Toleikytė, and P. Bertoldi, <i>Energy Service Market in the EU - Status Review and Recommendations 2019</i> , Vol. EUR 29979 EN of Scientific and Technical Report. European ESCO Market Reports Series, European Commission, Luxembourg, 2019
JRC 2021	Moles-Grueso, S., P. Bertoldi, and B. Boza-Kiss, <i>Energy Performance Contracting in the Public Sector of the EU: 2020.</i> , Publications Office, Luxemburg, 2021
GHG	Greenhouse gas
LTRS	Long-Term Renovation Strategy
NECP	National Energy and Climate Plan
m	million

⁶⁹ Payments made to acquire or to improve existing assets over a period of more than one year. Capex is recorded as liabilities on a balance sheet gradually over the course of an asset's useful life.

⁷⁰ In this report we abbreviate Energy Performance Contracting by using EnPC (and not EPC as widely used in the past) following the practice used in Boza-Kiss et al. (2019); this is important to differentiate Energy Performance Contracting from Energy Performance Certificates, commonly abbreviated as EPC.

MS(s)	Member State(s)
M&V	Measurement and Verification
n/a	No information or no data
NEEF	national energy efficiency fund
RRF	EU Recovery and Resilience Facility
RRP	Recovery and Resilience Plan (national)
TA	Technical Assistance
trln.	Trillion

BOOT – Build-own-operate-transfer. This model resembles a special-purpose enterprise created for a project. Clients enter long-term supply contracts with the BOOT operator and are charged accordingly for the service delivered; the service charge includes capital and operating cost recovery and project profit. BOOT schemes are becoming an increasingly popular means of financing combined heat and power projects in Europe.

Chauffage – Contract energy management. An ESCO takes over complete responsibility for providing the client with an agreed set of energy services (e.g. space heat, lighting, motive power). In a chauffage arrangement, the ESCO takes over full responsibility for fuel/electricity purchasing where the energy supply market is competitive. The fee paid by the client under a chauffage arrangement is calculated based on its existing energy bill minus a percentage saving. Such contracts may have shared savings and guaranteed savings elements to incentivise the customer. Chauffage contracts are very useful when customers want to outsource facility services and investments.

Energy Performance Contracting (EnPC), as defined in Article 2 of the EED, means a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measures are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings.

EnPC with guaranteed savings/guarantee savings modality. EnPC with guaranteed savings – contractor guarantees energy savings, and clients take the financial risk. The customers are financed directly by banks or a financing agency; this is an advantage over shared savings because finance institutions are better equipped to assess and handle customer credit risk than service providers.

EnPC with shared savings modality / shared savings modality. EnPC with shared savings – both parties share the savings, and the contractor takes finance risk. Under shared savings, the client takes over some performance risk. Hence it tries to avoid assuming any credit risk. A shared savings contract is likely to be linked with financing from the client and the service provider, whereby the latter repays the loan and

takes over the credit risk.

Energy Service Companies (ESCOs) provide turnkey services covering a full range of activities: energy audit, design engineering, construction management, arrangement of long-term project financing, commissioning, operations and maintenance, savings monitoring and verification. Their distinct feature is associated with their remuneration structure, particularly their performance-based projects (i.e. EnPC).

Energy Service Contract (ESC), Energy-as-a-Service (EaaS), and Lighting-as-a-Service (Laas) are contracts in which the focus is on the efficient supply of useful physical outputs (e.g., lumen-as-a-service or centigrade-as-a-service) instead of the implementation of energy savings measures. The payment is typically linked to a defined service rate or tariff based on agreed service levels. There can be energy and non-energy physical output performance criteria in the predefined service levels, but performance is typically not directly tied to energy savings or energy efficiency.

EnPC providers or providers are suppliers of energy services that implement energy efficiency or energy saving measures in the premises of a client repaying from the cost savings during the operation phase (general ESCO), that also provide a financial guarantee that the savings will be enough to cover the upfront costs and offer reimbursement should this prove wrong. In this meaning, a savings guarantee links the ESCO/EnPC provider's remuneration to achieving the contractually set savings target.

Public sector (markets, projects) refers in this research to current and potential EnPC projects addressed to public assets and, therefore, whose **clients are public bodies and public companies** whose decision processes and rules of procurement and finance depend on public bodies.

Public lighting. Lighting for streets, traffic and other outdoor public space.

Private sector (clients, markets, projects) refers in this research to current and potential EnPC projects addressed to private assets and, therefore, whose **clients are private actors**.

Third-party financing typologies

Debt financing. The situation in which investors lend a certain amount of money on credit in exchange for repayment plus interest. The most common EE financial product is a loan directly to the client (owner of the premises) or to the ESCO – i.e., third-party financing.

Guarantee (finance, fund or insurance). A risk-reducing tool which may help to attract financing. These are convenient for reducing the risk of default for the finance intermediary (technical and performance risk). For the client or provider, this may result in lower interest rates, longer maturities and lower collateral requirements.

Equity financing. The situation in which investors lend a given amount of money in exchange for a stake in a project. The most common example of equity financing is private equity. Concerning energy efficiency businesses, equity investment can take the form of an ESCO issuing additional shares in the company's common ownership.

Mezzanine Financing. Mezzanine financing is a hybrid form of financing that combines debt and equity financing. In most cases, debt is ranked as a preferred equity share. Mezzanine debt financing is thus riskier than traditional debt financing but more rewarding; it is associated with a

higher yield. Mezzanine financing also allows a lender to convert debt capital into ownership or equity interest in the company if the loan is not paid back on time and in full.

Project Financing. It is off-balance-sheet financing. In contrast to balance sheet financing (loans, debt and equity), its collateral is based on a project's cash flow expectations, not on individuals' or institutions' creditworthiness. Typical project financing is divided between debt and equity financing.

Leasing. Leasing is the energy market's common way of dealing with initial cost barriers. It is a way of obtaining the right to use an asset. Finance leasing can be used for energy-efficient equipment, even when the equipment lacks collateral value. Leasing companies, often bank subsidiaries, have experience with vendor finance programs and other equipment finance forms. Leasing is the most common form of equipment manufacturers' vendor financing, which is often applied in the case of CHP equipment. Leasing is often done as part of an SPV.

Special Purpose Vehicle (SPV)/Special Purpose Entity (SPE). A firm or other legal entity established to perform some narrowly-defined or temporary purpose, facilitating off-balance sheet project financing. A standard approach is to form an SPV/SPE and place assets and liabilities on its balance sheet. The investors accomplish the purpose for which an SPV /SPE has been set up – for example, implementing a large EE project – without carrying any associated assets or liabilities on their balance sheet.

Grants. Public money can be addressed through investment grants to incentivise energy performance, specifically EnPC.

Forfaiting. A mechanism that allows an agent to secure financing by selling receivables (i.e. the future cost-savings or fees charged by the provider) to a finance intermediary (the forfaiting provider); this allows the EnPC provider to lower its debt after commissioning the project and to undertake new projects, and allows the financial intermediary to access a long-term, low-risk payment stream.

Sources: Boza-Kiss et al., 2017; Economidou, et al., 2019; Launch Project, 2020; Fi-Compass, 2020; Pernetta and Bender, 2020; European Energy Efficiency Platform (E3P), 2020).

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Annexes

Annex 1. Review of policy implementation and support

EnPC in NECPs

	Refers to EnPC	Drivers direct / (indirect)	Indicated barriers to EnPC /(possible barriers to EnPC
AT	"Saving contracting"	Savings obligation on Federal buildings (Act 2014) Successful "saving contracting"	
BE Fl	YES	"EnPC (including EPC extension with increase + reduction in the threshold by the energy plan declared at 0.1 PJ) "Environmental incentive + mini-EPC" Government buildings strategies to include mechanisms (EnPC), each body to conduct self-scan Support to facilitation contracting and subsidy (10% of facilitation costs up to € 8,000) in the health sector Information to Schools since 2018 (5 EnPCs underway) 6.3.7 VEB model EnPC for large consumers in the public sector (VEB to further develop EnPCs and funding options) Annual reduction of the energy budget	(aggregation)
BE Wa	EnPC is Mainly available in the public sector, and will to widen EnPC to the private sector	easier recourse to EnPC (demonstrability Art. 7) Make easier to use intended for exemplary function Priority to EnPC (and to EU funds) (¿combined?) To develop 'UREBA exceptionnel' to attract investment to EnPC in the tertiary Regulatory framework to be assessed (2020)	
BE Br	ESCO and EnPC are underdeveloped in BE, despite successful experiences	Recognised potential for funding based on performance – EnPC – and clustering	
BE Fed		PPPs, EnPCs and green bonds are envisaged for major renovations The defence must renovate through EnPC	
BG	EnPC	Reliance on the EU Code of Conduct for EnPC, developed by Transparens ESCO expectations for housing Possible ESCO contract for the industry	
CY	EnPC	Information and promotion EnPC Supply (19 ESCOs registered), legal framework Existing technical support, ongoing preparation of template contract EnPC for public sector	lack of trust on the client's side, lack of technical expertise for tendering
CZ	EPC method	Continued support to EnPC, particularly in the public sector (goal to maximise efficient use of funds) Planned education on procurement and support to information centres which help with the preparation and documentation of EnPC projects Implemented M&V system	
DE	EnPC	Funding of EnPC consulting for municipalities and NGOs Dialogue on EnPC between federal and land governments	(Use of PPP to foster EE and RES)
DK	EnPC	EnPC (as PPP) is promoted in public buildings for construction, renovation, and maintenance. Information on EnPC for municipal and regional authorities	
EE	ESCO	Cooperative development of ESCO models (2019)	(Financing to housing associations - KredEx)
Fl	Barely mentioned	Municipalities are due to explore financing solutions (e.g. PPP, EPC and ESCO) as a part of voluntary agreements Highlights financial instruments in which investment costs are	

		paid by generating energy cost savings and state-guaranteed loans - for the energy poor	
FR	EnPC (CPE)	Compatibility issues between Heat Fund grants and EnPC could disincentivise EnPC?	Heat Fund Grants (not possible when EnPC is planned)
GR	EnPC and PPP for public buildings	ELEKTRA program for financing public buildings, also through EnPC Building stock renovation through PPP> EnPC (public and private tertiary) Special financing to be set for EnPC in the industrial sector Framework to be adapted for finance, administration Planned establishment of Energy Efficiency Fund (no mention EnPC) for refinancing and blended financing	Difficulty of financing through EnPC
HR	EnPC	Regulated EnPC in the public sector (OG No. 11/15)), and liberalised in the private sector	Need a combination of ESIF with PPP and ESCO Need clear regulation of EnPC Need examples EnPC
HU	ESCO-type	Introduced EEO, open to ESs "Encouraged ESCO-type financing"	
IE	NO71	Exemplary role of public buildings, demonstration, energy management, Monitoring and Reporting System (does not mention EnPC)	
IT	EnPC	New guidelines on EnPC for buildings (Legislative Decree No 50/2016) Conto Termico for tertiary buildings supports EnPC Improving contracts Quality control Simplified authorisation processes In the process of deciding requirement to have an energy manager (cantier ambiente)	Regulatory uncertainly EnPC (through PPP and procurement)
LT	Energy Efficiency Contracts, energy services in the public sector	The Public Investment Development Agency promotes ESs in the public sector. The Energy Efficiency Fund (€79.65m) provides advice to building managers and loans or guarantees to ESCOs working with public buildings and lighting Barriers to EnPC (not specified) addressed	
LU	No mention of EnPC or ESCo	Possibilities for EnPC "Being discussed" amongst administrations	
LV	"PESCO" and "EE contract" used for EnPC	Public bodies can conclude PESCOs Allowing private financing (ESCO) of multiapartment buildings Planned to develop a fiscally neutral model contracts Possible implementation of EE through ESCOs or long-term financing	EnPCs account towards debt when not observing Eurostat Lack of experience and guidelines Need long-term financing and repurchasing of cash flow
MT	ESCO (has not taken off)	Consultation conducted in 2017 Considering SPVs for off-balance EnPC	(Low energy intensity) (Long payback periods) (Availability of alternative sources of finance)
NL	EnPC (Growing but not widespread)	Good examples from the Central government; Guidelines for the Procurement of EnPC Facilitator pool trained by GuarantEE project Collaboration with the sector. Tax deductions for ESCO are being considered	

⁷¹ ESCO and EnPC not mentioned in NECP nor in Public sector report 2021. [Public-Sector-Annual-Report-2021.pdf \(seai.ie\)](#)

PL	No mention of EnPC. EE contracts.	Measures to be taken in 2021-2030 to support SMEs ESCOs EnPC in public sector units is allowed	The ESCO market is not yet mature, regardless of transposition. ESCOs struggle
PT	NO	Promoting EE in public buildings, lighting and other sectors, with emphasis on electrification and RES. Training for the EE sector (incl management, M&V) 2020-30	
RO	EnPC in the public sector (lighting)	Working group about barriers to EnPC in the public sector Priority to public lighting to develop experience and apply it to public buildings	Legislative framework and procurement rules Energy prices Funding Risk perception Mistrust and absence of standardisation (e.g. M&V)
SI	“Energy contracting (EPO)”	Design financial products for EnPC Provide assistance to EnPC (Training, quality assurance, tools for evaluation) Extend EnPC from the public to other sectors (housing) Promote the emergence of SME ESCOs	
SK	EnPC in public buildings and lighting	Defined ESCO and EnPC (guaranteed ESs, GES), and EnPC for the public sector as of 2014, list of providers, Annual data collected overall and public sector (reported in NECP 2014-2017) EnPC model compliant with Eurostat rules (2019) Technical assistance is under preparation to identify projects in public buildings and lighting	Need for ESCOs to be able to apply for support. Need non-repayable EU fin assistance. Guaranteed energy services, slowed by Eurostat, then recovered?
ES	EnPC	Pioneering role of autonomous regions – conduct own EE plans for public buildings –in EnPC and PPP Promotion of ESs New contracts for the public sector (Eurostat-compliant) and for the private sector (RES and EE) Expected aid and promotion to ESCOs	
SE	Energy services	Swedish Energy Agency connects customers and suppliers, promotes ESs amongst SMEs Developed Model contract (EnPC?) for housing associations	

EnPC in LTRS

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
AT	YES	<p>Renewed contracting plan for refurbishing federal buildings (2021-2030)</p> <p>Public sector voluntary agreement to reduce CO₂, largely through building renovation</p> <p>Consultant program for federal and other public authorities</p> <p>ES contracting platform. Planned database on energy-saving measures – not implemented</p> <p>Public sector need of EnPC for the financing of thermal refurbishment plans of Carinthia and Styria, renewables and EE in buildings and facilities of Upper Austria,⁷²</p> <p>EnPC platform for SMEs</p> <p>EnPC eco-label for service providers (first in EU), DECA association of EnPC providers (2005)</p> <p>(Estimated energy-saving potential for Public Buildings (84.7GWh 2021-30)) (Upper Austrian market)⁷³</p>	<p>Shifting attention “beyond” EnPC⁷⁴</p> <p>Limited uptake amongst SMEs (Focus on PV)</p> <p>(Dependence on long-term funding coordination between the federal and regional governments)</p>
BE Fl	YES	<p>Existing (2017) premium for the collective renovation of dwellings (at least 10) – Demonstrations in Antwerp and Mechelen</p> <p>Envisioned role for EnPC in education (maintenance and EnPC) and health buildings.</p> <p>Free Energy performance diagnoses, subsidies to EnPC (10% of the cost of facilitation) and 60% of costs in climate investment⁷⁵</p> <p>VEB facilitates OEnPC (maintenance and EnPC)⁷⁶</p>	<p>The Flanders authorities find problematic the Eurostat approach to off-balance treatment as one that incentivises ‘picking low-hanging fruits’ only, without working towards structural measures in the building envelope</p>
BE Wa	YES	<p>Establish a framework for EnPC and promote it in the public sector</p> <p>Facilitation of EnPC and PPPs</p> <p>EnPC (and PPP) role in fostering the exemplary role of public buildings through One-stop shops, project aggregation</p> <p>(Pooling of 96 projects for EnPC) ⁷⁷, de-</p>	<p>Perceived (banking) risk</p> <p>Promotion of PPP (communication to local authorities on existing solutions, standard documents, and innovation partnerships)</p> <p>Assumed limitations in depth of renovation with EnPC</p> <p>(loan guarantees for the disadvantaged)</p>

⁷² “To date, over 240 energy performance contracting projects have been financed in Upper Austria, with energy investments worth over €70 million. Typical energy performance contracting measures that are often implemented in both enterprises and municipalities include switching to efficient interior lighting, optimising heating control and regulation, eco-heating systems (in particular biomass heating systems), utilising waste heat, energy recovery, thermal insulation measures and street lighting refurbishments.”

⁷³ “The contractor offers a package of services that can be adapted to individual needs within the municipality or business in question. The term is usually between 5 and 15 years. Upper Austria was the first Austrian province and one of the first European regions to introduce direct funding for energy performance contracting. Energy performance contracting is a financing and operating model for energy efficiency and renewable energy. To date, over 240 energy performance contracting projects have been financed in Upper Austria, with energy investments worth over €70 million. For examples, please see: <https://http://www.energiesparverband.at/fileadmin/esv/Broschueren/Energie-Contracting.pdf>”

⁷⁴ EnPC platform for SMEs may be shifting efforts towards guarantee models, conventional contracting(2006 data?); Eco-label shifting attention to operational management contracting, energy consultations and implementation of an energy management system

⁷⁵ Flemish Government Decree of 30 March 2018

⁷⁶ Under the Horizon 2020 project ‘CitizEE’ the VEB devised a solution in combining EIB or EUInvest with ESCO financing and citizen participation (similar to Austria Co-OP)

⁷⁷ Promotion of project aggregation through investment platforms or groups, and consortia of small and medium-sized enterprises, establishing a de-risking platform and training for the banking sector, guarantee of loans for the disadvantaged groups, etc.).

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
		<p>risking platform, training for the banking sector, EnPC standardisation, support to small ESCOs, market monitoring EnPC, review management procedures and regulations, and maintenance agreements for these to enable the integration of EnPCs in public contracts.</p> <p>Continuation of RenoWatt (100 contracting authorities), IGRETEC (inter-municipal consulting firm and ESCO)</p> <p>Previous pilot (€38m awarded in EnPC in Liège for hospital and public housing)</p> <p>Public housing renovation (~ 5 000 dwellings/year) with a focus on leveraging the effect of public funding to possibly make an EnPC pilot</p> <p>(Strengthening the role of energy managers)</p>	groups)
BE Br	YES	<p>Foreseen establishment of a market and project facilitator service (fostering aggregation)78, a one-stop-shop for professionals</p> <p>easyCOPRO is a project to encourage the energy renovation of a jointly owned building through EnPC and other models</p> <p>Promote the concept of ESCO and EnPC</p> <p>Development of EnPC models and specific legal vehicles and support for EnPC</p> <p>Regional fund for ESCO, and partially revolving fund usable for ESCo development, and promotion of EnPC with public funding to aim at deeper renovations (Study potential for re-injecting cost savings)</p>	
BG	YES (EEPC or ESPC)	<p>Developed ESCO capacity and small market. →Furthering guaranteed savings for the public sector ()</p> <p>Linking financing to targets or achievements in building renovation</p> <p>Provision of “contracts with guaranteed score” and examples; introducing criteria and register for ESCOs; updating the Code of conduct</p> <p>(Development of a National Decarbonisation Fund for all types of buildings (JTF, InvestEU, EEOs and other funding), possibly linked to ESCO mechanism.)</p> <p>(Experience with revolving funds, guarantee funds and special credit lines)</p> <p>Possibility for a superESCO and specialist funds to buy receivables (alike LaBEEF)</p>	<p>Well-developed know-how and experience, but volumes are small</p> <p>Regulatory and legal: Not possible to conduct audits for EnPC; financing is restricted (ESPCs can only be funded by the ESCO or a third-party financier); required twelve-month for savings verification; legal uncertainty for ESCOs; limited possibilities for the sale of receivables; no possibility for off-balance treatment of ESPCs, and guaranteed savings are not recognised as a source of loan repayment</p> <p>Lack of experience with Green Mortgages, On-bill financing, and EnPC</p> <p>(Public buildings:79 Implementation of EMS (20 public buildings by 2030), Training for local authorities, Online platform to aggregate public building projects, List of verified contractors, Green bonds)</p> <p>(Funding through credit lines, guarantees and technical assistance (National mechanism for</p>

Support to Energy Performance Contracting projects and third party financing is explored, including the development and standardization of tools and documents, training in the banking sector, facilitating access to capital for smaller ESCOs, developing pilot projects, monitoring of the market, etc.”

⁷⁸ Recognizes costly nature of Project Preparation.

⁷⁹ (2021-2030 budget of BGN 7 800 million)

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
			financing energy efficiency – NMFEET)
HR	YES	Strategy indicated in the form of a proposal for policy-makers: Need to develop financial instruments to support ESCOs, to aid the development of ES and PPP market, e.g. co-financing model to allow for financial aid to be granted directly to the ESCO Need revolving fund with ESI funds, guarantee instruments, subsidised interest rates, public demand, standardised contracts with measurement and verification (for confidence)	Low creditworthiness of EE and ESCOs for national banks, lack of guarantees and high capital costs VAT and statistical treatment
CY	ESCO	There are 55 auditors and 12 ESPs authorised in the buildings sector, but there is very low activity. Underway measures: development of a methodology and software for the control of audits; online registration of services, preparation of standard public tender documents and guidelines	Lack of user confidence, lack of experience from ESCOs Possible barrier or driver: (Loan scheme (2020) for EE and renewables for households, SMEs and local authorities (Mutual Funds Fund, supported by CF, ERDF, national budget and loan guaranteed by the EIB– €40 + 40 million))
CZ	YES	Municipal and regional strategy for renovating public buildings supports EnPC EnPC is well developed in the private sector- Public building renovation: technical assistance (e.g. tendering) for EnPC in public and commercial buildings (EFEKT), free energy consultation centres (EKIS), subsidised documental preparation of EnPC projects (Subsidised energy management systems for local authorities and businesses) Will to diversify financing	Public buildings are bound by budgetary and accounting restrictions (the Eurostat rules did not help) Inv. Grants (public and private buildings) ⁸⁰
DK	Only in annex documents	ESCO contracts tend not to include financing since Kommunekredit is more advantageous (Examples: Frederiksberg with Schneider E. and Zealand with Siemens.) Circular on energy efficiency in the State Green bonds for Kommunekredit Aggregation through municipality partnerships and PPP (Gate21 in CPH region) (Grants from a fund for energy savings in buildings and business (DKK 500m/yr) are awarded to the greatest documented savings). (Advisory services of BetterHomes scheme, SparEnergi dk, Danish Knowledge Centre for Energy Savings in Buildings)	(Potentially competing financing: Municipal Mortgage Credit (Kommunekredit) provides loans and leasing to municipalities; National Building Fund (Landsbyggefonden) supports renovation of social housing; heat pumps on subscription)
EE	NO	Facilitation of lending for energy renovation of buildings, and “high energy performance, public-private partnerships”, “reduction of possible investment risks,	National tax, ERDF, CF and, to a lesser extent, H2020 to support loans, guarantees (e.g. for multi-dwelling renovation, mortgage guarantee) and grants (available) ⁸¹

⁸⁰ The Czech LTRS refers to investment allocation from Planned Funding for public sector from ERDF and CF (CZK 14000m), Planned Revenues from GHG emission trading (Green Savings Program) (For 2020, an allocation of CZK 1,350m) to subsidize EE in residential buildings, Planned Modernisation Fund (EIB) for the renovation of State buildings (CZK 15000m for 2021-2030), and PANEL programme (soft loans for EE measures in residential multi-apartment buildings): CZK 15 000 million for 2020-2030.

⁸¹ KredEx building SA (the State credit foundation) recommendations do not include EnPC.

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
		financial support and creation of a revenue base needed for financing the measures.” High targets (full renovation of all buildings built up previous to 2000 into NZEB) Funding needed and hence potential for ESCO financing (EC review) (Developing information and awareness measures) (Improving data availability and monitoring process.)	PPPs mentioned but not EnPCs Loans, loan guarantees (home buy, renovation and multi-dwelling renovation) and grants
FI	ESCO	ESCO projects receive an ESCO subsidy (25%) over 20% conventional subsidy (2017-2025) New (sectoral) contract forms 2017-2019 (?) Non-residential renovations opt for Business Finland investment subsidy for “ESCO projects (requires guaranteed energy savings)” (unrestricted duration) Arrangements with ESCOs to provide information to clients and providers	Obligations in the public sector have been met on a voluntary basis
FR	YES	Standardised technical sheet for EnPC (CPE services) (2018) and premium (2019?) to encourage) execution and installation works in Multiowner buildings Support to local and regional authorities (Big Investment Plan): equity investment from CDC in Energy EPC (€1b total in grants and subsidies, of which 0.5 is for EnPC and “Intracting”. ⁸² FAIRE (ADEME, ANAH and ANILO) One-stop-shop and sectoral network for the household renovation National renovation observatory (Creation of a guarantee fund for low-income renovation) ADEME’s shared energy consultancy scheme and CEE programmes.	Fragmentation (general barrier to public tertiary renovation) needs intercommunal pooling (Competing financing; Soft loans from the CDC (€2b), “The Energy Saving Certificate (CEE) schemes, the ERDF and the ADEME Heat Fund serve to fund operations)
DE	YES	contracting support “contracting check” (non-resid municipal buildings, non-profit and SMEs), “Contracting: Build the Future” (public properties), and consultation audits on (EBK and KfW) on commercial municipal and non-profit buildings, and urban redevelopment EnPCs blueprint ESCO/EPC contracts and guidelines esp. for the public sector in BEEF federal- state dialogues on the use of ESCO/contracting The BAFA promotes ES markets and addresses barriers to ESCO and EPC. Upcoming demonstration of 10-15 forms of ESCO contracts used in ‘model’ projects at local and land-level Barriers are addressed, and an integral approach is ongoing Strategy open to diverse contracting options	Annual market monitoring by the BfEE More consultations are desirable. EU State aid law “imposes significant hurdles on energy-efficient building support”
HE	YES	(Upcoming)Electra programme provides	(Competitiveness of renewables and required

⁸² “Innovative funding scheme that serves to create a virtuous circle of funding derived from energy savings to finance renovation works.”

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
		investment loans for EnPC renovation of public buildings (expected 4Ktoe/yr) (Upcoming) collaborative design of Innovative blended/hybrid finance programmes to include EnPC along with blended concessional loans, lease-financing, risk-sharing instruments such as blended insurance, and guarantee instruments (as well as aggregating) for tertiary, domestic and industrial sectors	Solar thermal in new buildings)
HU	YES	Envisioned introduction of Eurostat-compliant EnPC contracts(2023-27) Planned development of model contracts and incorporation of Eurostat guidance into Law Planning to address confidence issues through measured-based accounting, settlement of energy price changes, and shared savings Planned monitoring of the EnPC market Renovation of health buildings with ESCO (2020-2022) Securitisation, green bonds Possible establishment of a green bank to provide guarantees. Introduction of green interest rebate (MNB)	Barriers to development of ESCO markets: low energy prices and long paybacks, high volume of EU non-refundable funds, high costs of refurbishment in public buildings (Paybacks longer than 10 years, with maximum acceptable without client financing being 15 years, which increases national endebtment.
IE	YES	Recommended ESRI: guidelines, template contracts, grants, fuel tax) for ESCO development development of a new energy services framework, public sector analysis underway in 2020 (SRSS funds) SEAI support to EnPCs through training (e.g. managers) and expertise for public and private sectors Planning a de-risking instrument to help bundle projects for EnPCs) double-check Large scale EnPC project recently delivered in a hospital	ESCO market in preliminary stage (besides Dublin!?)
IT	YES	Financial measures include EnPC Continuation of Conto Termico, simplifying access and promotion of ESCO and EnPC models, and focusing on tertiary Region of Liguria, as part of the Enershift project, concluded the first call for tenders for large-scale energy retrofitting using Energy Performance Contracts in public social housing (investment € 15m) Municipality of Marsala, 80 social housing renovated through Public-Private Partnership in Finance Projects(Legislative Decree 50/16) Aggregation and de-risking tools, guarantee funds etc. Eco- Super- (efficiency and RES) and Sismabonus tax rebates for seism-proofing, with RRF White Certificates incentive for buildings and district heating NEFF (national budget) to guarantee financing operations (30%) and subsidised loans (70%) Green bonds (increasing market value)	Public consultation participants called for EnPC and PPP linked to bonuses and greater standardisation of EnPC and PPP contracts. NEEF guarantees efficiency loans but needs standardisation, and measurement for risk assessment, green mortgages and EnPC, especially in multi-family buildings Fund for building renovation and purchase

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
LV	YES	<p>LABEEF refinances EnPCs in (private) multi-apartment buildings (EBRD and private investment)</p> <p>Loans to purchase cash flow of ESCOs (max €2m, below 45% of the financing, and max 20 years loan)</p> <p>PPP, ESCO and cooperation with credit institutions are pointed as key.</p> <p>ALTUM Green bond guarantees energy efficiency improvements (backed by the EIB and PF4EE facility by the LIFE programme)⁸³</p> <p>LTRS call for increased effectiveness of limited resources</p>	<p>Limited ESCO experience and creditworthiness, unknown to businesses and FIs, besides ALTUM (finances building renovation)</p> <p>Need loan portfolio (refinancing). Use of EU funds for refinancing not accepted⁸⁴</p> <p>EnPC investment accounted as debt (PPAs already possible but complex)</p> <p>Lack of model “contracts for the industry?”, for municipal sector (limited contracts now at 5years)(Expecting approval)⁸⁵</p> <p>Payback for EE in public buildings 20 years</p>
LT	ESCO	<p>New repayable grant of up to 80% and a loan of up to 20% of the investment for ESCO projects of state building renovation (March 2020)</p> <p>(Setting up of one-stop-shop -not mentioned as related to EnPC)</p>	<p>Low energy prices (need price and tax measures to reduce payback period)</p> <p>Market to take off, no legal framework for ESCOs, no list of ESCOs nor criteria for ESCO classification (cites JRC 2019)</p> <p>Need aggregation</p> <p>(Potential trans-sectoral transfer of multi-apartment renovation financing through subsidies, preferential loans and interest fixing)</p>
LU	ESCO	<p>Developing de-risking instrument (investment bundling platform) to bundle projects for EnPCs and mobilise SMEs in cooperation with EIB (2020)</p> <p>PRIME House national funding scheme (deep renovations) may allow access of ESCOs to grants</p>	<p>Lack of coordination national level, Development of EnPC would need a complementary approach to avoid competition between tools</p>
MT	YES – not supported	<p>Building construction company to review the saving and EnPCability of the public building stock</p> <p>(Mandatory public building energy managers (2023) and EMSs (2025))</p>	<p>EWA consultation concluded there is little potential take up for Malta (long payback periods, need to include maintenance contract)</p>
NL	Vague	<p>Sustainable Housing Platform supports EnPC with Green Lease in private commercial rental</p> <p>Existing risk-sharing mechanism through a collaboration of Heating Fund and National Energy Savings Fund with private partners (mortgage guarantee)</p> <p>(Centralised database creation, building digitisation, and data standardisation)</p> <p>(National roadmap for public buildings)</p> <p>(Existing sustainability investment fee for rental premises)</p>	<p>General barriers stated include administrative and initial costs, risk awareness, and split incentives.⁸⁶</p>
PL	YES	Promotion of ESCOs and EnPC through a	

⁸³ EUR 20 million, with funding up to EUR 2 850 000 per project, with only 15% of the company’s own participation.

⁸⁴ Based on EIAH opinion of 18 May 2019, plans for a Cabinet Regulation on the use of EU funds to co-finance ESCO investment was dropped.

⁸⁵ EIB Jaspers order supported the developmetn of off-balance contracts.

⁸⁶ The LTRS specifies “high initial investment costs, a frequent lack of awareness of the potential savings and difficulty in accessing incentives... administrative or preliminary costs, to make carrying out the measure accessible and appealing; difficulties in obtaining loans from credit institutions, including via ESCOs, due to lending procedures that are still highly conservative and uncertainties about projects based on cash flow or where innovative incentive schemes are involved; risk of payment default for measures financed by ESCOs; perceived high risk, high interest rates and lack of subsidised funding; asymmetry of information: barriers to the implementation of energy efficiency measures due to a lack of awareness of the potential benefits of savings and difficulty in accessing incentives; split incentives: impediments due to the fact that the economic benefits of efficiency measures are often not experienced by those who have to pay the investment costs.”

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
		<p>platform and knowledge centre on ESCOs like an existing one on PPP</p> <p>Procedures for aggregation of EnPC</p> <p>Strengthened provisions on EnPC in 2021 revision of Act of May 2016</p> <p>Adequate intensity of support in private buildings (30-70% of eligible costs) to enable EnPC, PPP, ESCO</p> <p>(Popularisation of comprehensive investor services (One-stop-shops))</p>	
PT	YES	<p>EnPC to channel investment IFE2020 (EIB supported) in public buildings (as an alternative to 95% of investment subsidy including reimbursable subsidy – 70% of savings return)(unclear amount of resources available in LTRS)</p> <p>Off-balance EnPC and EE management contracts (incorporating EE and RES)</p> <p>Municipal and regional one-stop-shops for advice and finance</p> <p>(Strengthening the inter-ministerial network to renovate public buildings)</p> <p>(Requalifying Local Energy Managers)</p>	
RO	YES	<p>The National Energy Regulatory Authority (ANRE) coordinates a Working Group to develop a framework for ESCO</p> <p>ENERFUND instrument of financial decision-making for deep renovation (H2020 Episcopo and Enermap)</p> <p>Planned assessment of PPP and EnPC as models for public building renovation during harmonisation with Eurostat guidance.</p> <p>(Planning mass refurbishment of public buildings through technical assistance for local authorities, schools, aggregation and standard tenders (with performance indicators))</p> <p>/Introducing performance criteria in public procurement)</p> <p>(Creation of NEEF (private and SFs – maybe national budget))</p> <p>(BUILD UP Skills Romania and 'BUS Qualishell' provided training for renovation, RES, and NZEB)</p>	<p>Lacks regulatory framework for ESCOs; EnPCs are rarely used for energy renovation of buildings (but for energy supply systems)-> potential in DH?</p> <p>Incentives are needed for EnPC or PPP in public buildings.</p> <p>Calls for district heating renovation with EnPC. DH is requirement for residential funding.</p> <p>Price subsidies for heating</p> <p>Funding options: Grant (100%), Loan and grant, partly repayable grant (20-60%) for all type of buildings</p>
SI	YES	<p>By 2023 design financial products and quality support to EnPC providers, extend the program to the private sector (esp. housing), encourage the emergence of SMEs ESCOs</p> <p>By 2022 Ecofund (private funds?) for ESCOs in the housing sector</p> <p>Cohesion funds for the public sector and ESCOs</p> <p>By 2021, One-stop-shop for multi-family buildings (Project Office) (names ESCOs)</p> <p>Possible creation of a guarantee facility and maybe a guarantee fund, providing amongst other EnPC guarantees)</p> <p>(Proposed debt-purchasing scheme for EnPC providers)</p>	
SK	YES	<p>Blending repayable and non-refundable EU Structural Funds with guaranteed energy</p>	<p>Unclear success of renovation in non-residential buildings through EnPC (absence of</p>

	Attention to EnPC	EnPC policies / indirect drivers)	Stated Barriers / (Possible barriers)
		<p>services (EnPC) (Private sector ESI Funds 2021-27)</p> <p>Private non-residential building renovation financed by FIs, equity, EU SFs guarantees, and provider financing??</p> <p>Off-balance EnPC with public bodies Feb 2018 (Act No 321/2014)</p> <p>Technical assistance for public bodies' projects drafting (Slovak Innovation and Energy Agency).</p>	<p>other support). No progress in private commercial</p> <p>Need a combination of EnPC with grant funding to avoid lock-in.</p>
ES	YES	<p>Public Sector Contracts Act (2017)⁸⁷allows ES tenders without duration limit, with price variations</p> <p>Regional authorities are urged to promote off-balance EnPC models (NECP); Contracts available: IDAE, Extremadura and Catalonia.</p> <p>Promotion of Central Government buildings self-consumption, renewables and ESs (NECP= Standard for ES providers' (UNE 216701) (2018)⁸⁸</p> <p>Upcoming regulation of energy communities (residential and commercial) to incorporate ESs</p> <p>Turnkey solutions promoted in criteria for public investment in renovation projects for Homeowners' Associations (Turnkey, also in NECP)</p> <p>Already offset regulatory and trust-related barriers to ESs in the public and private sectors</p>	<p>Rules on the de-indexation of prices⁸⁹</p> <p>Limited promotion of new rules on ESs in public sector</p> <p>Need incentives or instructions for EE in public buildings⁹⁰</p> <p>Need promotion of EnPC in renovation of thermal installations</p> <p>Private sector pursues short-time returns (equipment and lighting (Loans and grants to efficiency and renewables measures (solar and geothermal) (PAREER II retrofitting programme 2017, with strong performance requirements,⁹¹ covering all costs (ICO line), ERDF support to EE, and fiscal reform)</p> <p>(Large scale projects mentioned in LTRS refer only to ESCO, yet involve combination of public and private financing⁹²)</p> <p>Need to step up efforts (EC Recommendations)</p> <p>A) development of 'Limited Guarantee Fund' supporting loans from banks</p> <p>B) One-stop-shops network (regional and municipal scopem C) ESCOs to add work on the building envelopes to their supply and maintenance contracts</p>
SE	NO	<p>Efficient public procurement requirements (Ordinance 2014:480) (Supported loans, equity, guarantees and Technical assistance (EU support))</p> <p>(Offentliga fastigheter exchange and collaboration forum⁹³)</p>	<p>Kommuninvest i Sverige AB (Kommuninvest) owned by municipalities and regions offers loans and advice</p>

Source: [Long-term renovation strategies \(europa.eu\)2020](#) (last consulted 9 June 2022); [swd-on-national-long-term-renovation-strategies.pdf \(europa.eu\)](#)

⁸⁷ Law 9/2017 includes the Contract for Services with Investment, the Service Concession Contract and the Mixed Supply and Service Contract

⁸⁸ Referred in LTRS as responding to criticism on quality of services.

⁸⁹ LTRS: "According to the ESCO sector itself, the main obstacle would be the current price review rules relating to public contracts, which, on account of the law on the de-indexation of the economy, would make it difficult to publish review formulas and also to put in place long-term contracts."

⁹⁰ LTRS suggests to reintroduce measures in Plan AGE-330 and Plan 2000-ESEs.

⁹¹ Measures include: (i) improving the energy efficiency of thermal and lighting installations; (ii) conventional solar energy substitution; (iii) replacement of conventional energy by geothermal energy; and (iv) improving the energy efficiency of the thermal envelope. The aid can be in the form of repayable loan or grant.

⁹² The ESCO model is used in the integral renovation of a district in Valladolid, with a mix of public and private investment (European FP7 CityFied Project).

⁹³ Additional source *Ekelin et al (2019), Kartläggning av möjligheter för grön finansiering av energieffektiviseringsåtgärder – Förstudie* [Ekelin et al (2019), Review of opportunities for green financing of energy efficiency improvement measures – Preliminary study].

EnPC and related investment in the RRP

MS	RRP 05/22	Key investments and measures (multiple sources)
AT	RRP not available, website in German 94 Service contracts: "Dienstleistungsvert" RRP: €4.5b	Website: Service contracts are used in the processing of EU subsidies Thermal renovation and EE of residential buildings (€209 million) involves private support – (€504m, incl. e-mobility), district and renewable heating (€159m) (Comp.1) RES, EE and adaptation in cultural and municipal buildings and town centres (€65m) (Comp. 4) Renewable Heating Law.95
BE	RRP does not make reference to ESCOs nor EnPC RRP: € 5.9b96	Renovation of public and private buildings (flagship) (€1012m, 17.1% of the RPP)97 Mass renovation of public buildings through contracting and financing (RenoWatt – ELENA), aggregated municipal procurement (in-house ren. -?), and UREBA subsidies (heavy ren.)98 Simplification of administrative procedures – recognised as obstacles to EE measures)99
BG	RRP in BG, €6.9b	Energy Renovations of buildings, street lighting and renewables for households (€924m 2022-25, <30% savings, Primary savings 1.1TWh/year)100 Grants (commercial and public sectors) can be combined with financial instruments or ESCO services (only €129m private finance planned) (NECP, Renovate) National Decarbonisation Fund (NECP) to enable grants and cost savings to back financial instruments (2023 the earliest) (Renovate)101
HR	RRP in Croatian makes references to EnPC and ESCo, €6.3 billion102	ESCOs to be involved in the deployment of PV, renovation in public buildings, a pilot project for energy management in public buildings (incl. residential), the development of a new financing model, involving ESCOs Building renovation (incl. thermal efficiency, and earthquake and fire resistance) encourages the ESCO model (60% ESCO fin., 40% RRF grants) Legal changes needed for continuation of ESCO renovation model103
CY	RPP: No refs to ESCOs and EnPC, €1.0b	EE in SMEs, municipalities, and the overall public sector (€40m, 8.9 %); upgrading hospitals (62%),104 and SMEs. May involve EnPCs Possible opportunities: energy audits, smart solutions (parking, lighting, and waste collection management) for municipalities Recognition that inefficiencies in contract enforcement
CZ	Plan not found. No references to ESCO nor contracting.105 RRP: €7b	Large scale EE renovation of residential and public buildings (€1.6b), renewables for businesses and households (€480m)106 (Also district heating, replacement of coal-fired boilers in households107, boosting ongoing renovation programs in households (green roofs, shading) and schools) 108 Upcoming EnPC model contract (1st RRF inst.) 109 Bonus for savings from EnPC or Performance Design & Build method (Renovate highlights) 110 Possible opportunities: speeding administration; green procurement criteria, training to contractors (Comp. 4.1); financial support to SMEs(?)111112
DE	Plan in DE.113 No	Funding for EE renovations (30% savings) (Mission 1, 22.1 % of 11.3b Mission 1, 9.2 %

⁹⁴ [The EU Reconstruction Plan - Federal Chancellery of Austria \(bundeskanzleramt.gv.at\)](https://www.bundeskanzleramt.gv.at/bundesministerium-finanzen/oesterreichischer-aufbau-und-resilienzplan-2020-2026); Bundesministerium Finanzen. Österreichischer Aufbau- und Resilienzplan 2020-2026. Wien, 30. April 2021. Only key word found: "Dienstleistungsvert"

⁹⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021SC0160&qid=1624626088799>

⁹⁶ [be_rrp_summary.pdf \(europa.eu\)](#)

⁹⁷ [Belgium's National Recovery and Resilience Plan \(europa.eu\)](#)

⁹⁸ [FR - Plan national pour la reprise et la résilience.pdf \(belgium.be\)](#)

⁹⁹ [FR - Plan national pour la reprise et la résilience.pdf \(belgium.be\)](#)

¹⁰⁰ Residential buildings (€608.18b), public buildings (€193.13b), manufacturing and commercial buildings (€122.67b) renewable energy for households (€71.58b), energy-efficient street lighting systems /€76.32b) [swd_2022_106_4_en.pdf \(europa.eu\)](#)

¹⁰¹ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹⁰² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021SC0197&from=EN>

¹⁰³ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#) "the ESCO renovation model of public buildings which mobilised private capital and which was very successful between 2016-2020 is no longer applicable and needs some legal modifications and this process is very slow and uncertain [Yet] The plan foresees further development of the ESCO market."

¹⁰⁴ [Cyprus's National Recovery and Resilience Plan \(europa.eu\)](#)

¹⁰⁵ [Zprava-o-realizaci-NPR-2019.pdf \(vlada.cz\)](#)

¹⁰⁶ [com-2021-419-czechia_factsheet_en.pdf \(europa.eu\)](#)

¹⁰⁷ [Czechia's National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\)](#)

¹⁰⁸ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹⁰⁹ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹¹⁰ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹¹¹ [Czechia's National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\)](#)

¹¹² [EUR-Lex - 52021SC0211 - EN - EUR-Lex \(europa.eu\)](#)

MS	RRP 05/22	Key investments and measures (multiple sources)
	mention to ESCo or EnPC in docs reviewed. RRF= €25.6b	of overall RRF) Modernising public administration, reducing barriers to investment (Mission 6, 3.6b, 12.6% of RRF) ¹¹⁴ Urban transition pilots with integrated energy solutions (1.3.2) gy supply in urban neighbourhoods through pilot projects Carbon pricing Possible opportunities. EC: Doubling of the share of RESs in heating from 14.6% in 2019 to 27% by 2030 will require further measures (incl. financial and advisory) ¹¹⁵
DK	No ref to ESCo or EnPC in EC analysis, RRP: €1.5b	EE in buildings and SMEs (€ 235m). EC analysis calls for increased public and private investment in EE ¹¹⁶ Speeding the conversion from oil and gas to electric heating, district heating and energy renovations (private and public buildings), subsidies for private households ¹¹⁷
EE	RRP in EE. No mentions to EnPC found. €969.3m	Sustainable energy and EE (C4): RES, smart grids, storage, and household efficiency (€92.1m, 9 % of RRF). ¹¹⁸ Green Fund to support innovative green technologies (€100 million)
ES	Plan in Spanish. No mention to “ESCO”, EEF, guarantees. RRF: €69.5b	Funds allocated to the construction sector without indication of EE earmarking (€69.5b). EE renovations and construction of buildings (€6,8 billion, additional €1b for public buildings, €150 million to upgrade sports facilities, 6.8b, 9.8% of RRF for housing rehabilitation and urban renewal plan). Allocation of €3.6b specific for renovation, with minimum PE savings of 30%. RES relevant (powerup). Renewable energy integration (also in buildings) (3.2m, 4.6% of RRF). ¹¹⁹ Poss. Opportunities: public administration modernisation and digitalisation.
EL	Plan in GR. RRF= €31.2b	Renovation wave (€2.71b) including residential buildings (€1.2b). Renovation of public buildings (c.a. €300b): with the involvement of ESCOs; upgrade of street lighting (€0.2b); ¹²⁰ new framework for EnPC “Amendment of the legal framework for the attraction of strategic investment. Construction of new energy efficient buildings” (€40b) Analysis: Guarantee system to de-risk RES-CHP and RES Promoting private-sector investments through the RRF Loan Facility (€ 12.7b, 37% to be allocated to EE, climate and demonstration) Administration procedures (contract enforcing, credit granting, permits, legal stability)
FI	RRP does not mention ESCOs nor EnPC, ¹²¹ €2.1b	Phase out fossil oil heating in public buildings by 2024 and overall by 2030 (Comp. P1C3)(€110m, 5.3% of RRF) Low carbon solutions for communities and transport (€40m) ¹²²
FR	No mention to ESCOs nor EnPC in RRP, ¹²³ RRF= €39.4b	Renovation of public buildings (65%), social buildings (9%) and private buildings (24%) of the €5.83b allocated to Comp. 1 (RRF is €39.4b)
HU	RPP in HU, docs reviewed do not mention “ESCO”. ¹²⁴	Improvement of public procurement and tendering, not explicitly related to EnPC
IE	No mention ESCOs, services, EnPCs; RRF €0.99b	De-risking a low-cost residential retrofit loan scheme (€40M, 4% - C11), Accelerate decarbonisation of the enterprise sector (€55M, 5.5 % - C12), A public-sector retrofit pathfinder project - Beggar’s Bush (€60M, 6 % - C13) ¹²⁵

¹¹³ [Federal Ministry of Finance - German Development and Resilience Plan \(DARP\) \(bundesfinanzministerium.de\)](https://www.bundesfinanzministerium.de)

¹¹⁴ [Germany’s National Recovery and Resilience Plan \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_germany_national_recovery_and_resilience_plan_en.pdf)

¹¹⁵ [EUR-Lex - 52021SC0163R\(01\) - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021SC0163R(01) - EN - EUR-Lex)

¹¹⁶ [Denmark’s National Recovery and Resilience Plan \(europa.eu\); Denmark’s recovery and resilience plan | European Commission \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_denmark_national_recovery_and_resilience_plan_en.pdf)

¹¹⁷ [Denmark’s National Recovery and Resilience Plan \(europa.eu\); Denmark’s recovery and resilience plan | European Commission \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_denmark_national_recovery_and_resilience_plan_en.pdf)

¹¹⁸ [Estonia’s National Recovery and Resilience Plan \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_estonia_national_recovery_and_resilience_plan_en.pdf)

¹¹⁹ [Spain’s National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\), https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021SC0147&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021SC0147&from=EN)

¹²⁰ Bruegel. Also points at “improve Greece’s ranking in international indicators, in particular the World Bank’s Doing Business; (b) reduce procedures, time and the cost of enforcing contracts, getting credit, getting electricity, registering property, and getting a construction permit; and (c) ensure a stable and predictable legislative framework.”

¹²¹ [Finland’s recovery and resilience plan | European Commission \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_finland_national_recovery_and_resilience_plan_en.pdf)

¹²² [Finland’s National Recovery and Resilience Plan \(europa.eu\); swd-2021-284_en.pdf \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_finland_national_recovery_and_resilience_plan_en.pdf)

¹²³ Search terms: “entreprises de services énergétiques”, “contrat de performance énergétique”, “marchés de services énergétiques”. [PNRR Français.pdf \(economie.gouv.fr\); France’s National Recovery and Resilience Plan \(europa.eu\)](https://www.pnrr.fr/fr/le-pnrr)

¹²⁴ [Recovery and Resilience Tool \(RRF\) | Széchenyi Plan Plus \(gov.hu\); Recovery and Resilience Facility \(RRF\) | Széchenyi Plan Plus \(gov.hu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_recovery_and_resilience_tool_rrf)

¹²⁵ [Ireland’s National Recovery and Resilience Plan \(europa.eu\)](https://european-council.europa.eu/media/e3000000/1/press/2021/05/20210514_ireland_national_recovery_and_resilience_plan_en.pdf)

MS	RRP 05/22	Key investments and measures (multiple sources)
		EC analysis praised Plan for supporting private investment ¹²⁶
IT	RPP in Italian. RRF € 68.9b grants + €122.6b loans	Building EE renovation including Ecobonus and Sismabonus schemes (€15.4b, 8.0%), renewables (Mission 2) Upgrade of school buildings, making them safe: (Mission €4m 12.6% of €30.88b) ¹²⁷ Best practice: extension of SuperEcobonus (covers up to 110% of renovation costs, building owners need to pay for renovation up front) banks and ESCO are eligible ¹²⁸ Public procurement simplification and prioritisation of competition, ¹²⁹ acceleration of procedures for EE, training for ESCOs (Reform 1.1)
LT	Plan in LT €2.2b	Building renovation (26% of C-2 823m, 37% of RRF) ¹³⁰ Education and health also include building renovation and RES ¹³¹
LU	Plan in FR, does not indicate ESCO ¹³² €93m	No budget for building efficiency? EC recommends a greater focus on the green and digital transitions, the energy renovation of buildings (only relevant in the housing), and RES. Need financing for private building renovation ¹³³
LV	Plan not in EN (20/8/2022), ESCO not found in LV version. RRF €1.8b	EE in multi-apartment, central government, historical and municipal, and business buildings (34% of €676m for climate measures - total of €1826m) Improving the register of public procurement contracts, competition, and modernisation of the administration (C-6) ¹³⁴ The EC calls for “a strategy for ensuring long-term sustainable financing” and the use of EnPC in public and tertiary buildings ¹³⁵
MT	RRP does not mention ESCOs nor EnPCs; ¹³⁶ RRF €344.9m	Energy efficiency renovations and the greening of buildings is the largest project (60m) ¹³⁷ Long-term renovation strategy in the building and construction industry. RES to be integrated in public spaces and roads. ¹³⁸ (shift from public lighting investment?)
NL	Not submitted by May 5 2022	No reference to ESCo or EnPC found in national plan nor EC review ¹³⁹
PL	RPP in PL. ESCO and EnPC (“umowy o poprawę efektywności energetycznej”) mentioned once. No analysis or briefing available from EC or Parl.	“Amendment to the act on EE. The proposed act will clarify in which situations EE improvement contracts (EPC contracts) do not have the effect of increasing the level of public debt. Possibility of “settling the obligation to save energy by obligated entities under the so-called subsidy programs. These programs will also be open to authorised entities (e.g. ESCOs) providing energy services to the obliged entities.” Google Translated ¹⁴⁰
PT	Plan in PT. RRF: €16.6b (13.9b in grants)	New EE buildings and the renovation of buildings (climate contribution €211m, 1.3% of RFF); (300m to residential buildings, 240m to public buildings, and 70m to services sector buildings) (Building renovation horizontalised in social and health, Renewables and hydrogen (370m, 2.2% of RFF) ¹⁴¹

¹²⁶ [EUR-Lex - 52021SCO205 - EN - EUR-Lex \(europa.eu\)](#)

¹²⁷ [Italy's National Recovery and Resilience Plan \(europa.eu\)](#)

¹²⁸ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹²⁹ [EUR-Lex - 52021SCO165 - EN - EUR-Lex \(europa.eu\)](#)

¹³⁰ [Lithuania's National Recovery and Resilience Plan \(europa.eu\)](#)

¹³¹ [EUR-Lex - 52021SCO187 - EN - EUR-Lex \(europa.eu\)](#)

¹³² [Recovery and resilience plan for Luxembourg | European Commission \(europa.eu\)](#)

¹³³ [Luxembourg's National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\); EUR-Lex - 52021SCO187 - EN - EUR-Lex \(europa.eu\)](#)

¹³⁴ [Latvia's National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\)](#)

¹³⁵ “opportunities of undertaking necessary reforms and enabling conditions to attract private investment for renovations and use of ESCOs (energy performance contracting especially in public and tertiary buildings) are not explored. Moreover, ...sustainable innovation (business models, products and services), green skills, have been left outside the plan.”
https://ec.europa.eu/info/sites/default/files/com-2021-340_swd_en.pdf

¹³⁶ [Malta's Recovery Resilience Plan - July 2021.pdf \(gov.mt\)](#)

¹³⁷ Public buildings (9.6m) and private buildings (19.3m), and combined EE and RES in schools and hospitals (30m).

¹³⁸ [Malta's National Recovery and Resilience Plan: Latest state of play | Think Tank | European Parliament \(europa.eu\); EUR-Lex - 52021SCO269 - EN - EUR-Lex \(europa.eu\)](#)

¹³⁹ <https://www.rijksoverheid.nl/documenten/rapporten/2022/10/10/definitief-nederlands-herstel-en-veerkrachtplan>;
https://ec.europa.eu/info/system/files/com_2022_469_1_en_0.pdf

¹⁴⁰ [KPO sent to the European Commission - National Recovery Plan - Portal Gov.pl \(www.gov.pl\)](#) in Polish

¹⁴¹ No explicit references to escos in EC analysis. Yet there is this note: “The establishment, capitalisation and mission expansion of Banco Português de Fomento, are expected to result in a lasting structural change for investment. The proposed increase of the bank's

MS	RRP 05/22	Key investments and measures (multiple sources)
		Possible opportunities: Quality and Sustainability of Public Finances, Economic Justice and Business Environment, Digital Public Administration 142 EC analysis: Renovation is not picking up due to public procurement rules and lack of demand (private).
RO	Plan in RO. RRF: €29.2b (half grants)	EC acknowledges the Plan's focus on the renovation of buildings. Renovation Wave fund for renovation of public buildings (€575m), and private and public buildings (€2.15b); Efficient CHP (€300m) Poss. Opportunities: E-procurement and streamlining of norms 143 Renovate recommendations "leverage private finance and develop more market-based mechanisms (incl. EnPC)", training, One-stop-shops ¹⁴⁴
SI	Plan in Sloven. "ESCO" not included. RRF: €1.8b	Building renovation (€86.05m of 1064.75m RFF, 2.5% of Climate contribution) includes renewables and EE, the introduction of BIM strategy, and a revolving fund for renovations in the public sector to be self-financed with savings (fund support not specified) reported as an opportunity for ESCO financing for capital-intensive refurbishments with smaller savings) ¹⁴⁵ Sust mobility: €311.9m (street lighting or other eligible EnPC investment?) Poss. Opportunities: Legal reform for renewables and EE. Digital transformation of the public sector and public administration, and strengthening of competences for the green transition High-efficiency renewables district heating, installing new renewables capacity and upgrading the electricity-distribution network (€146 – found challenging by EC) 146
SK	Plan not in EN. RRF: €6.3b	LTRS lays out renovation investment needs of €13.5bn until 2030. RRP funding is €776m (mostly grants). EnPC is possible for public bbs ¹⁴⁷ EC Analysis:148 Structural reforms needed, Regional Sustainable Energy Centres (RSEC) and EnPC.
SE	Plan ins Swedish. Does not mention "ESCO". RRF: €3.3b, 44% contribute to climate objectives	Analysis: Green recovery component (1552m) includes smart energy systems, district heating efficiency, measures in other sectors, and aid for EE in multi-dwelling buildings (59.8m, of which 23.9m are considered climate contribution, i.e. 0,7% of the EEF). ¹⁴⁹

capital to more robust levels is expected to support the bank in the process of becoming InvestEU implementing partner and, thus, to facilitate access to finance, particularly for SMEs affected by the crisis. In addition, the creation of a special purpose vehicle, which is expected to invest in viable Portuguese firms in the form of equity and quasi-equity, should address the structural problem of firms' undercapitalisation. Both measures are expected to boost private investment, productivity growth and job creation potential on a long-term basis."

¹⁴² [EUR-Lex - 52021SC0146 - EN - EUR-Lex \(europa.eu\)](#)

¹⁴³ [swd2021_276_en.pdf \(europa.eu\)](#)

¹⁴⁴ as well as "Developing a long-term financing strategy highlighting the planned use of different public financing sources and how they would be combined to accelerate the rate of deep renovations in line with LTRS targets." And "ensure programmes are taken up at scale by financing and supporting technical assistance to end users across the public and private sectors (e.g. support for municipalities, one-stop-shops, public education about energy and support policies, digitalisation), as well as supporting training and skilling a sufficient workforce. [Renovate2Recover Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹⁴⁵ [Country Specific Recommendations and Recovery and Resilience Plans - Thematic overview on climate and green transition related issues \(europa.eu\)](#)

¹⁴⁶ [EUR-Lex - 52021SC0184 - EN - EUR-Lex \(europa.eu\)](#)

¹⁴⁷ [Renovate2Recover Full-Study-1.pdf \(renovate-europe.eu\)](#)

¹⁴⁸ [com-2021-339 swd_en 0.pdf \(europa.eu\)](#)

¹⁴⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0102&from=EN>

EnPC in H2020 projects active during 2020-2021

Name	SUNSHINE provides a standardised, long-term energy performance contract for deep renovation
Coordinator	Riga Technical University in Latvia
Information	Cordis.europa.eu/project/id/649689 ; sharex.lv
Period	1 March 2015- 29 February 2020
Budget	€ 1 555 991,25 (EU contribution € 1 555 991,25)
Countries	Latvia, Netherlands
Type of measures and location	Residential and public building renovation
Engagement of EnPC	EPC with renovators to guarantee energy savings and/or the same energy service at a lower cost. Banks are hesitant to support ESCOs in Latvia, hence refinancing is enabled by sales of future cash flows or receivables to the Latvian Building Energy Efficiency Facility (LABEEF) in a forfeiting transaction
Contracts duration	15-20 years
Achievement	€30m of energy-related investments 202020m2 of public and multi-family buildings deeply renovated renovated 30-60% Secured savings 26 GWh/year reduced total energy consumption guaranteed savings over
Outcomes	<i>City of Riga committed to including energy efficiency guarantees in future renovations and new construction</i>
Learnings/ key claims	Need “mandatory inclusion of energy efficiency guarantees or EPC for the renovation of public infrastructure” for the development of the ESCO market.
Name	Accelerate SUNSHINE (Save your bUildiNg by SavINg Energy)
Coordinator	Riga Technical University in Latvia
Information	https://cordis.europa.eu/article/id/435517-reducing-the-risk-and-capitalassociated-with-deep-energy-efficiency-renovations ; https://cordis.europa.eu/project/id/754080
Period	1 April 2017- 31 March 2021
Budget	€ 1 577 140 (EU contribution € 1 577 140)
Countries	Latvia
Type of measures and location	Residential deep renovation
Engagement of EnPC	standardised, long-term energy performance contract for deep renovation. standardised project process and guidelines, bundling of EnPC projects. SUNSHINE set up the Latvian Building Energy Efficiency Facility (LABEEF) with the aim of forfeiting receivables from EPCs and therefore reducing the debts on ESCOs' balance sheets.
Contracts duration	
Achievement	31 projects; EUR 25.5m guaranteed savings, 27 million of investments (planned), 27GWh/year
Outcomes	LABEEF
Learnings/ key claims	Demonstrated scalability of forfeiting + EEF model
Name	E-FIX
Coordinator	ConPlusUltra in Austria
Information	https://cordis.europa.eu/project/id/785081
Period	1 March 2018-30 June 2021
Budget	€ 2 005 075 (EU contribution € 2 005 075)
Countries	Austria, Armenia, Georgia, Croatia, Czechia, Poland
Measures and location	Financing,
Engagement of EnPC	Pilots of EnPC, leasing and crowdfunding to foster private financing. Training provision on EnPC and project finance. EnPC replacement of heating devices in the Pokrzywnica municipality in Poland
Contracts duration	

Achievement	78 projects, €31m investment, 54.09 GWh/year energy savings
Outcomes claimed	Enabler role: new policies, investment in energy savings and renewables
Learnings/ supported argument	Priority to energy-saving goal. Flexible and context. Situated choice of EnPC and other financing and implementation mechanisms – considered instrumental
Name	ENERINVEST Spanish Sustainable Energy financing Platform
Coordinator	DELOITTE ADVISORY SL
Information	https://cordis.europa.eu/project/id/695822
Period	February 2016- March 2019
Budget	€ 1 926 958,75
Countries	Spain
Measures and location	creating a consulting platform which will provide financial, technical and legal solutions to sustainable energy, facilitating the dialogue among the different stakeholders involved
Engagement of EnPC	Potentially useful for EnPC financing
Contracts duration	
Achievement	Guide to financing for sustainable energy projects, database of projects (SEP e-Platform), and financial assessment tool (SEP financial assessment Tool) , National Roadmap for Political Leaders
Outcomes claimed	Exchange of information and improved knowledge of the financing context
Learnings/ supported argument	Alike EnPC, SMI approach departs from acknowledging that SMEs need to focus on their core business, and to avoid other risks
Name	ESI Europe – Driving Investment in Energy Efficiency through Energy Savings Insurance in Europe (GoSafe with ESI)
Coordinator	Basel Agency for Sustainable Energy (BASE)
Information	cordis.europa.eu/project/id/785061 , esi-europe.org , gosafe-esi.com , Reduced risk for SMEs contemplating energy efficiency
Period	February 2018- January 2020
Budget	
Countries	Italy, Portugal and Spain
Measures and location	turnkey solution for SMEs wary of the risk of investing in energy efficiency.
Engagement of EnPC	Engagement of insurance companies (6) and FIs (5) Exchange of information
Contracts duration	
Achievement	
Outcomes claimed	
Learnings/ supported argument	Alike EnPC, SMI approach departs from acknowledging that SMEs need to focus on their core business, and to avoid other risks
Name	Energy Efficiency Investments in multi-family houses (HouseEInvest)
Coordinator	Agencia Extremeña de Energía
Information	https://cordis.europa.eu/project/id/846085
Period	March 2018- May 2022
Budget	€ 1 798 733,75
Countries	Spain
Measures and location	Creation of a one-stop-shop with a financing facility for full energy renovation of multi-family houses in Extremadura
Engagement of EnPC	Availability of technical and financing support, along with standardised project solutions
Contracts duration	
Achievement	€35m in investment
Outcomes claimed	Expectation of €113 being invested in the region through increased awareness and use of the model

Learnings/ supported argument	
Name	Financing Energy Efficiency using Private Investments (F-PI)
Coordinator	DELOITTE ADVISORY SL
Information	https://cordis.europa.eu/project/id/784986
Period	May 2019- April 2022
Budget	€ 1 443 437,50
Countries	Spain
Measures and location	Provision of technical assistance to private funds to boost their capital in energy efficiency, and promotion of project bundling
Engagement of EnPC	Improved information of financing actors
Contracts duration	
Achievement	Engaging €30m in private investment
Outcomes claimed	Reduced transactional costs through on the promotion of energy efficiency projects
Learnings/ supported argument	
Name	Financing scheme for Energy Efficiency and Renewable energy Guaranteed in Deep renovations of building stock (FinEERGo-Dom)
Coordinator	Krajowa Agencja Poszanowania Energii Spolka Akcyjna
Information	https://cordis.europa.eu/project/id/847059 ; https://fineergodom.eu/the-first-call-for-applications-for-the-priority-programme-renovation-with-guaranteed-savings-epc-energy-performance-contract-plus-has-been-launched-in-poland/
Period	June 2019-May 2023
Budget	€ 1 654 338,75
Countries	Poland (and expertise from The Netherlands, Latvia, Bulgaria, Austria, Slovakia, Romania, and Bulgaria)
Measures and location	Refining and implemeting guaranteed financing schemes for energy efficiency and renewable energy in deep renovations of buildings in five EU countries, using as a model the Latvian Energy Efficiency Facility (LABEEF) for supporting energy efficiency and renewable energy in deep renovations of public and private buildings successfully implemented in Latvia.
Engagement of EnPC	Estimulation of the ESCO and EnPC model through national funds (NFOSiGW, in Poland form multi-family private and municipal buildings, public buildings, individual residential buildings, housing communities, and cooperatives
Contracts duration	20+ years in Poland
Achievement	
Outcomes claimed	Development of a roadmap for renovation of residential buildigns in Poland
Learnings/ supported argument	
Name	LAUNCH – Sustainable energy assets as tradable securities
Coordinator	Joule Assets Europe Group in Italy
Information	cordis.europa.eu/project/id/847048 ; launch2020.eu
Period	May 2019-October 2021
Budget	
Countries	
Measures and location	SMEs
Engagement of EnPC	Production of standardised materials, included EnPC contracts and risk assessment protocols
Contracts duration	
Achievement	€150 million pipeline of project investments, including €2.1 million in deals closed during the project, and €31 million of investments being processed for finance at the end of the project
Outcomes claimed	Establishment of a Sustainable Energy Financing Association (SEFA)

Learnings/ supported argument	Difficult financing for SMEs and small projects
Name	QualitEE (Quality certification frameworks for Energy Efficiency services to scale up responsible investment in the building sector))
Coordinator	e7 energy innovation and engineering in Austria
Information	cordis.europa.eu/project/id/754017 ; qualitee.eu , https://cordis.europa.eu/article/id/422273-quality-assurance-for-successful-energy-efficiency-services
Period	1 June 2017- 30 June 2020 (relies on outputs from previous projects 2013, 2015, 2017, 2019)
Budget	€ 1 603 718,75
Countries	Austria, Belgium, UK, Slovenia, Germany, Greece, Latvia, Slovakia, Spain, Bulgaria,
Measures and location	
Engagement of EnPC	Toolkit for standardisation, quality assessment, procurement, and financial assessment of projects; Database on Energy Efficiency Services markets of 15 Member States.
Contracts duration	
Achievement	
Outcomes claimed	stimulate EnPC markets growth by driving improvements in trust, information and standardisation.
Learnings/ supported argument	EPC markets are growing, that the EPC concept was generally perceived as too complex, and that pressure to cut energy costs drives the entire market.
Name	SMARTER – SMARTER Finance for Families – Improving Citizens' Health, Comfort and Financial Well-Being by Supporting Banks, Residential Investors and Solution Providers with Green Homes and Green Mortgage programs
Coordinator	Romania Green Building Council
Information	cordis.europa.eu/project/id/847141 , c2e2.unepdtu.org/smarter
Period	15 May 2019- 14 November 2021
Budget	
Countries	
Measures and location	Residential
Engagement of EnPC	Green mortgages for EnPC. Tool for holistic green certifications for banks to assess projects as beneficiaries of green mortgages.
Contracts duration	
Achievement	
Outcomes claimed	helped investors and developers understand energy performance criteria and demonstrate this performance to homebuyers Developed two platforms: Green Home Investment Platform ¹⁵⁰ and the Green Homes Solution Providers ecosystem
Learnings/ supported argument	"banks should demand very ambitious energy performance and other environmental criteria to qualify their green financial projects" Borncamp
Name	Smart EPC- NEXT GENERATION OF ENERGY PERFORMANCE CONTRACTING
Coordinator	REGIONALNA ENERGETSKA AGENCIJA SJEVEROZAPADNE HRVATSKE
Information	https://cordis.europa.eu/project/id/101031639
Period	1 February 2022 – 31 January 2025
Budget	€ 1 998 396,25
Countries	Croatia, Spain, Poland, France; Belgium
Measures and location	modernisation of public lighting in European cities
Engagement of EnPC	Development of an advanced Smart EPC concept and standardised documentation for integration of energy and non-energy services in Energy Performance Contracting
Contracts	

¹⁵⁰ "The platform includes timely research on how 'green' affects financial risk and performance, key developments of interest to the banking and investment communities, and even information on ongoing residential projects," Borncamp.

duration	
Achievement	
Outcomes claimed	
Learnings/ supported argument	
Name	TRUST-EPC-SOUTH - Building TRUST in Energy Performance Contracting for tertiary sector energy efficiency and sustainable energy projects in Southern European Countries
Coordinator	CREARA CONSULTORES SL
Information	https://cordis.europa.eu/project/id/649772
Period	1 March 2015 - 30 June 2018
Budget	€ 1 936 975
Countries	Portugal, Spain, France, Italy, Croatia and Greece
Measures and location	Sustainable energy in tertiary buildings
Engagement of EnPC	Scale-up investments on Energy Efficiency (EE) and other Sustainable Energy (SE) in the tertiary sector of southern European countries, with particular focus on Energy Performance Contracts (EPC)
Contracts duration	
Achievement	
Outcomes claimed	
Learnings/ supported argument	Untapped potential in the tertiary sector of Southern European countries
Name	GuarantEE- Energy Efficiency with Performance Guarantees in Private and Public Sector
Coordinator	BERLINER ENERGIEAGENTUR GESELLSCHAFT MIT BESCHRANKTER HAFTUNG
Information	https://cordis.europa.eu/project/id/696040
Period	1 April 2016 - 31 March 2019
Budget	€ 1 586 558,20
Countries	Germany, Austria, Norway, Ireland, Belgium, Spain, Romania, Slovakia, Lithuania, Czechia, Slovenia, Netherlands, Italy, France
Measures and location	Public buildings renovation
Engagement of EnPC	Addressing split incentives and rigidity of contracts by developing new model contracts, market development in emerging markets through guidance and examples to municipal clients
Contracts duration	
Achievement	33 pilot projects in buildings that are privately and publicly owned; 78 GWh PE; 18000 tCO2/year savings; >€11m investment triggered
Outcomes claimed	
Learnings/ supported argument	
Name	PRODESA- ENERGY EFFICIENCY PROJECT DEVELOPMENT FOR SOUTH ATTICA
Coordinator	DIMOS ALIMOU-MUNICIPALITY OF ALIMOS
Information	https://cordis.europa.eu/project/id/754171
Period	1 May 2017 – 31 January 2022
Budget	€ 1 058 760
Countries	Greece
Measures and location	Energy efficiency improvements in municipal buildings and public lighting
Engagement of EnPC	Bundling EnPCs enabling its take-off in Greece Financing from the National Revolving Fund for Energy Efficiency, the Utility ESCO Fund and the European Crowdfunding Network
Contracts duration	
Achievement	Interventions in 116 municipal buildings, 3.2 MW of photovoltaics

	45.6 GWh/y energy savings 4.8 GWh/y renewables production €20.24m cost of intervention
Learnings/ supported argument	
Outcomes claimed	
Name	TIGER- Triggered Investments in Grouping of buildings for Energy Renovation
Coordinator	REGIONE ABRUZZO
Information	https://cordis.europa.eu/project/id/101018403
Period	1 June 2021 - 31 May 2024
Budget	€ 1 087 075,75
Countries	Italy
Measures and location	Social Housing renovation
Engagement of EnPC	Investment through EnPC
Contracts duration	Payback of 4 years
Achievement	€16m, 126 buildings, 58 municipalities, 8.8GWh/h PE savings, 1760tCO2/y
Outcomes claimed	
Learnings/ supported argument	
Name	EnerSHIFT- Energy Social Housing Innovative Financing Tender
Coordinator	Regione Liguria
Information	https://cordis.europa.eu/project/id/694816
Period	1 February 2016 - 31 January 2020
Budget	€ 967 687,50
Countries	Italy
Measures and location	Social housing (rental)
Engagement of EnPC	implementation of investments without or with limited public capital funding through EnPCs
Contracts duration	
Achievement	
Outcomes claimed	
Learnings/ supported argument	The main concept underpinning the project is that economic shortages and public spending review do not currently make it possible to find budget for design and for investment.
Name	AmBIENCe (Active managed Buildings with Energy performaNce Contracting)
Coordinator	VLAAMSE INSTELLING VOOR TECHNOLOGISCH ONDERZOEK N.V (Belgium)
Information	
Period	1 June 2019-31 May 2022
Budget	€ 1 999 875 (EU contribution € 1 999 875)
Countries	Belgium, Italy, Spain, Portugal
Type of measures and location	Smart technologies
Engagement of EnPC	extending the concept of Energy Performance Contracting to Active Buildings and making it available and attractive to a wider range of building
Contracts duration	
Achievement	

Outcomes	to extend the concept of energy performance contracting to active buildings and make it available and attractive to a wider range of buildings.
Learnings/ key claims	Potential for combining savings from energy efficiency measures with additional savings and earnings from the active control of assets, leveraging, for instance, price-based incentive contracts.
Name	SENSEI (Smart Energy Services Integrating the Multiple Benefits from Improving the Energy Efficiency of the European Building Stock)
Coordinator	INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY STICHTING
Information	https://cordis.europa.eu/project/id/847066
Period	1 September 2019-31 August 2022
Budget	€ 1 968 006,25 (EU contribution € 1 968 006)
Countries	Netherlands, Spain, Belgium, Greece, Denmark, Italy
Type of measures and location	
Engagement of EnPC	develop concepts and business models for pay for performance (P4P) retrofits
Contracts duration	
Achievement	
Outcomes	Promote appearance of first P4P pilots in EU
Learnings/ key claims	
Name	<i>NOVICE New Buildings Energy Renovation Business Models incorporating dual energy services</i>
Coordinator	UNIVERSITY COLLEGE CORK - NATIONAL UNIVERSITY OF IRELAND, CORK
Information	https://cordis.europa.eu/project/id/745594
Period	1 June 2017-31 May 2020
Budget	€ 2 041 206,25 (EU contribution € 2 041 206,25)
Countries	Ireland, Spain, UK, Greece, Austria, Finland, Germany
Type of measures and location	Building renovation
Engagement of EnPC	develop an improved EPC model for building renovation to better monetise energy efficiency, involving EE; RES, and DR
Contracts duration	10 years, reduced to 7,5 with DR
Achievement	Expected 20.8 m EUR of investments in building renovation, 25.2 GWh/year primary energy savings
Outcomes	
Learnings/ key claims	
Name	BAPAUURA Building energy retrofitting Assistance by Public authorities in AUvergne-Rhône- Alpes
Coordinator	ADEME
Information	https://cordis.europa.eu/project/id/891839
Period	September 2020- 31 August 2023
Budget	€ 1 475 593,85
Countries	France
Type of measures and location	Renovation of public buildings in small and medium-sized municipalities
Engagement of EnPC	Renovation, WhCs, OSS, Grants

Contracts duration	
Achievement	115 municipality buildings, 23,627,000 € of total energy efficiency investments (leverage factor of 16), 7.8 GWh/year of primary energy savings, 1,437 t CO2 e/ year
Outcomes	
Learnings/ key claims	small and medium-sized municipalities lack technical and legal expertise, hindering the use of advanced contracting schemes and "scattered grants"
Name	SPEEDIER SME Program for Energy Efficiency through Delivery and Implementation of Energy Audits
Coordinator	UNIVERSITY COLLEGE CORK - NATIONAL UNIVERSITY OF IRELAND, CORK
Information	https://cordis.europa.eu/project/id/847034
Period	1 June 2019-30 November 2021
Budget	€ 2 165 126,25
Countries	Ireland, Spain, France, Italy, Romania
Type of measures and location	Implement energy saving measures outcoming from energy audits, in SMEs
Engagement of EnPC	Aggregated SMEs, shared savings
Contracts duration	
Achievement	
Outcomes	
Learnings/ key claims	
Name	BuildUP
Coordinator	POWER PARITY SA.
Information	https://cordis.europa.eu/project/id/785091
Period	1 May 2018 -30 April 2021
Budget	€ 999 437,50
Countries	Portugal
Type of measures and location	
Engagement of EnPC	Address scale and public procurement barriers to EnPC, and to include renewables self-consumption. Bundle projects according to specific characteristics (investment size, technology, geography) using the currently available framework and consolidated procurement procedures to provide projects with scale, improve bankability, investor-trust and result in a faster time-to-market
Contracts duration	
Achievement	58 sustainable energy projects € 49,9m total investment 155 GWh/year of primary energy savings 3,1 GWh/year of renewable energy generated
Outcomes	
Learnings/ key claims	
Name	DeliveREE - DELIVER Renewable Energy and Energy efficiency projects in Dublin
Coordinator	CITY OF DUBLIN ENERGY MANAGEMENT AGENCY LIMITED
Information	https://cordis.europa.eu/project/id/101032833
Period	1 June 2021 - 31 May 2025
Budget	€ 1 174 661,25
Countries	Ireland

Type of measures and location	
Engagement of EnPC	Energy Supply and Energy Performance Contracts, with performance guarantees
Contracts duration	
Achievement	€20.4m investments, 140 sustainable energy Projects, 3,977 tCO ₂ -eq year
Outcomes	
Learnings/ key claims	
Name	SmartSPIN- Smart energy services to solve the Split INcentive problem in the commercial rented sector
Coordinator	UNIVERSITY COLLEGE CORK - NATIONAL UNIVERSITY OF IRELAND, CORK
Information	https://cordis.europa.eu/project/id/101033744
Period	1 September 2021 – 31 August 2024
Budget	€ 1 996 787,50
Countries	Ireland, Greece, Netherlands, Spain,
Type of measures and location	Smart Energy Services (SES) deployed via performance-based contracting in the commercial rented sector.
Engagement of EnPC	Energy Efficiency-as-a-Service (EEaaS) concept that couples the contractual agreements between tenants, building owners and energy efficiency providers with technologies for energy monitoring, management and measurement and verification (M&V), increasing transparency, credibility and persistence of savings.
Contracts duration	
Achievement	Tested business model in 3 pilot regions (Spain, Greece and Ireland)
Outcomes	
Learnings/ key claims	
Name	NEON – Next-Generation Integrated Energy Services fOr Citizen Energy CommuNities
Coordinator	ENGIE
Information	
Period	September 2021 - February 2024
Budget	€ 1 999 812,50
Countries	France, Italy, Spain, Cyprus, Switzerland, Serbia
Type of measures and location	building energy efficiency, renewable energy generation and storage, and demand flexibility for Citizen Energy Communities
Engagement of EnPC	Integration of EnPC and P4P schemes and establishing innovative M&V methodology
Contracts duration	
Achievement	
Outcomes	
Learnings/ key claims	
Name	REFINE- Mainstreaming of refinancing schemes as enhancer for the implementation of energy efficiency service projects
Coordinator	E7
Information	
Period	September 2021 – February 2024
Budget	€ 1 745 697,50
Countries	Austria, Italy, Croatia, Czechia, Greece, Latvia, Slovenia, and Spain (alongside the non-EU countries

	of the UK and Ukraine)
Type of measures and location	Developing refinancing capacities for ESCOs
Engagement of EnPC	
Contracts duration	
Achievement	
Outcomes	Market assessment of refinancing.2021 indicates that this is available in Austria, Czechia, and Latvia, in development in Spain and Italy, and not available in Slovenia, Croatia and Greece.
Learnings/ key claims	

Source: [European Commission : CORDIS : Search : Results page \(europa.eu\)](#)

Annex 2. JRC report on EnPC markets 2022. Country summaries

1 Austria

Comparison previous status

In the JRC report of 2021, the Austrian public sector was considered a developed market characterized by a well-developed ESCO market, with adequate provision and facilitation services, model contracts, and relatively lengthy and large contracts (10 years and longer, and above €1m). However, the public EnPC sector had turned to alternative contract models, e.g. technical guarantees, and was considered static. Negative trends were expected to be reversed in the period 2020-23. Advantageous financing conditions for public authorities, relatively low savings being achieved through existing EnPC models in building renovations, the interest in climate neutrality and renewables, national rules on public debt, complex administration, and lack of requirements for saving guarantees and private finance involvement (or long-term targets for regional and local bodies) were considered as the major causes of this stagnation of the public EnPC market.¹⁵¹

Current Status highlights

During the 2020-21 period, activity has been low. The market has been described as stagnant in research conducted by project RefinEE.¹⁵² According to responses to the EU Survey 2022, whether it may have slowly picked up in the public sector is uncertain. The main intervention sites in the public sector involve public buildings (education), lighting, district heating and project pools (indicated as 2 in a range from 0 to 3). Some activity was identified for transport and industry (1 out of 3). Some reviewers also highlighted tourism and hospitality buildings. Public sector contracts involve mostly the replacement of specific elements (3/3). Maintenance, energy management and installation of control systems are also relevant (2/2), whilst integral renovation and installation of renewable generation are rare (1/1). Energy audits, monitoring, and verification are relatively well-established parts of EnPC projects (2/2).

Table A 1. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Number of contracts	40	60	100	Low activity
Overall size m€	36	36	72	No estimates available
Typical* size m€	0.3 – 1.5	0.2 – 1.0	0.1-1	
Typical* duration (yrs)	10	3 - 8	<10	
Typical* payback	10	3 - 8	<7	
Typical* % of baseline	20 - 30	30 - 40	15-30	
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022).

¹⁵¹ Statistical treatment of EnPC in government accounts is of limited relevance in Austria. Off-balance contracts were already available according to the JRC report of 2021 but budgetary limitations apply to local and regional authorities.

¹⁵² Refine EE. 2021. D2.4 Refinancing Market Assessment Report.

Table A 2. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Slow take-off	Stable	The public sector is waiting for the new energy efficiency law. The private sector is running
Perspective 2022-2024	Slow take-off	Slow take-off / Rapid take-off	Due to the context of energy prices and shortages in supply (2022), upcoming efficiency law for the public sector, and well-developed private sector

Source: EU Survey 2022

Status of the business environment

The major highlights of service availability are 15 providers and 10 facilitators, as indicated in the EU Survey 2022. These actors provide high-quality services, especially the providers (rated 3/3), but are considered insufficient to satisfy the market (both rated 1/3). Understanding and willingness to operate with the EnPC model was rated as barely acceptable for private clients and the financing sector (all values 1/3) and good for the public sector.

Table A 3. Availability, sufficiency and quality of services. Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	15	1	3	
Facilitators	10	1	2	
One-stop-shops				No impact identified
Financing actors willing to support EnPC		2	2	Banks are risk-aware but willing to support ESCO projects
Other				

Source: EU Survey 2022.

Table A 4. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC and the willingness to use EnPC of potential clients in the public and private sectors and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	3 federal, 2 local	1	1	The Federal Real estate company is committed to EnPC for energy management of buildings but not for retrofits. Diverse approaches in federal states
Willingness	2 federal, 1 local	1	1	

Source: EU Survey 2022.

Contract modalities and alternatives

EnPC operates mainly with guaranteed savings. The establishment of a facility management contract, and to an extent of Consultancy and technical guarantee and Energy efficiency improvement contracts may be relevant to understand the lower penetration of EnPC, mainly in the private market but also in the public sector (See table below). Currently, there is a diverse offer of ESCO services without guarantee.

Table A 5. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	3	1	2	The public sector must be financed via the supplier
EnPC with shared savings (both parties share the savings, the contractor takes the financial risk)	1	1	1	
Build-own-operate-transfer (BOOT)	2	1	1	
Contract energy management (chauffage)	1	1	1	
Facility management	2	3	3	
Consultancy and technical guarantee	1	2	2	ESCO projects without guarantee
Energy efficiency improvement contracts	1	2	2	
PPPs	2	0	1	
Other				

Source: EU Survey 2022.

Regulatory framework

The implementation of the EU regulatory framework is perceived as good in terms of definitions, guidelines, model contracts for the public sector, lists of qualified operators and use of EnPC in demonstration projects. As barely acceptable were reported model contracts for the private sector, information instruments, the use of EEOs and WhCs, Energy audits, the use of EnPC in fulfilment of the exemplary role of public bodies' buildings and the adoption of adequate public rules and practices of procurement, contracting and tendering.

Table A 6. Perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

Instrument	Rating	Comment
EnPC Definitions: Rating (0-3)	2.5	
EnPC Guidelines: Rating (0-3)	2.5	
EnPC Model contracts public sector (whether off- or on-balance sheet): Rating (0-3)	2.5	
EnPC Model contracts private sector: Rating (0-3)	2	
Lists of EnPC qualified operators: Rating (0-3)	1.5	
One-stop-shops: Rating (0-3)	-	
Other information instruments: Rating (0-3)	1	
EnPC demonstration projects: Rating (0-3)	2.5	
Obligation schemes /White Certificates: Rating (0-3)	1	
Energy Audits: Rating (0-3)	1	
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings): Rating (0-3)	1	
Government rules and practices of procurement, contracting and tendering: Rating (0-3)	1	

Source: EU Survey 2022.

Financing

The most used financing sources identified by respondents to the EU Survey 2022 are provider funds and debt financing. Since retrofits are uncommon to non-existing in Austria, provider funds usually suffice to finance interventions on building elements and systems. Refinancing through forfeiting mechanisms existed and attained a certain degree of maturity in the past but was reported as not currently in use after a slowdown of the EnPC market in 2018.¹⁵³ (Table).

Table A 7. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	0		1	Public sector projects must be financed via supplier
Provider funds			3	
Public funds			1	
Third-party Private funds			1	
Client funds				
Provider funds				
Third-party Public funds				
Third-party Private funds				
Private financing inst.				
Public financing inst.				
Debt financing			3	Preferred over forfeiting in the private sector
Guarantees and guarantee funds				
Equity financing				
Mezzanine financing				
Project financing				
Leasing			1	
Special Purpose Vehicles				
Grants			1	
Forfeiting			1	Not in use
Other				

Source: EU Survey 2022.

Barriers

The major barrier identified by consulted experts is the overall scepticism towards EnPC as an instrument for building retrofits. There is competition with ESCO models without guarantee (along with establishing other models such as facility management, consultancy with technical guarantee and efficiency improvement contracts) and a lack of qualified workers to conduct renovations. In the upcoming 2022-2023, the complexity of the model and the lack of integrated approaches of deep renovation and decarbonisation – in alignment with most advanced models – are also expected to weight down the uptake of the model.

¹⁵³ [REFINE-D2.4-Refinancing-Market-Assessment-Report.pdf \(refineproject.eu\)](#)

Eurostat treatment of EnPC

The impact of the updated treatment of EnPC in government finance is considered nil, and plans to develop a model in alignment with Eurostat requirements for off-balance treatment have been dropped. Debt considerations are addressed at the regional level.

Drivers

Sectoral drivers were not indicated by experts participating in the EU Survey 2022 from 2019 to 2021, and no specific drivers of the EnPC market have been identified. Increasing energy prices, expected shortages in 2022, and interest in the public and private sector targets for climate neutrality are key drivers for EnPC development in the upcoming 2022-2024 period. Currently, there are sectoral expectations on the upcoming deployment of a €50m revolving guarantee fund for ESCO models with guarantees (energy supply contracting and EnPC).

EU support

Expert review grants little relevance to EU support in fostering the development of EnPC in Austria. There are no expectations put on EU funding. The most appreciated instruments are the DEEP and EEFIG Underwriting toolkit, EGD package, and PDA (investment portfolio above €7.5m). However, the latter is considered too demanding for most projects to opt for it. Alike ELENA, PDA is of difficult implementation due to the insufficient scale of bundle projects at the federal-state level.

Table A 8. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			1		Fragmented market	
Guarantee Facility of the Smart Finance for Smart Buildings initiative			0			
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			0			
InvestEU			0			
RRF			0			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			1			
European Green Deal, Fit for 55			1			

Source: EU Survey 2022.

Perspective

According to consulted experts (EU Survey 2022) a slow take-off is expected in the period 2022-2025 is expected. Such a take-off would relate best to context factors and overall climate neutrality targets than to specific EnPC policy and market developments. There are expectations for a shift towards integrating renewables and deep renovation in EnPC projects.

Recommendations

Possible ways to foster the EnPC market in Austria raised by expert participants in the EU Survey 2022 are:

- Simplifying whilst adapting contracts to trends about incorporating wider benefits of EnPC, including off-balance treatment, deeper renovation, climate neutrality, comfort improvement, and RES.
- Creation of a public quality control system or mechanism and Market monitoring.
- Public sector strategies and funding rules require guarantee mechanisms and the engagement of private financing to achieve building renovation and carbon neutrality targets.

- Federal-level institution of capacity is needed to execute the Green Deal. This could also facilitate ELENA aggregation at the federal level (e.g. coordinated by Klima- und Energiefonds and Austrian Energy Agency).
- Monitoring the benefits of guarantee funds to potentially support its upscaling/ Increasing the volume of subsidies (providers also ask for inclusion of all operating costs).

At the EU level, greater accessibility to PDA is demanded by experts participating in the EU Survey 2022. National recommendations on public funding rules that require guarantee mechanisms and the engagement of private financing to achieve building renovation and carbon neutrality targets could be made extensive to the EU rules for fund allocation. In general, there is a challenge both for Austria and the EU to create simple business models to attract clients and private funds.

2 Belgium

Comparison previous status

Belgium was described in the JRC 2021 as a sizeable public EnPC market but still in the development phase, particularly mature in Wallonia (e.e. Project RenoWatt). Innovative mechanisms and quality improvements fostered market uptake, and growth was expected to be sustained. The public sector market was amongst the best supplied in terms of EnPC provision and facilitation, and facilitation was reported to be a driver for market development. Off-balance contract models were already in use in the public sector. Contract lengths and size were among the EU's largest (up to 15 years, and often above €2m). A trend towards increased quality, depth and comprehensiveness, and climate neutrality were also reported. However, there was some concern about the efforts of the Federal Government for having achieve its building renovation targets. Moreover, remaining issues of trust, awareness and understanding were still a problem reported in 2021. The expertise of ESCOs and the limited budgets of clients have gained relevance throughout the years as drivers of the EnPC market. (Geers 2022).¹⁵⁴

Current Status highlights

Compared to JRC 2021, the EU Survey 2022 shows that the major intervention sites have continued to be public buildings, typically encompassing the overall portfolio of local authorities (rated 3/3). Bundles of local authority buildings are relatively common (1.5/3). District heating is the second most common intervention site (1.5/3), followed by public lighting (1/3). In some newly built districts, homeowner associations are created and sign EPCs with ESCOs for maintenance and sometimes including technology supply. Energy performance of privately owned buildings, transportation infrastructure, smart grids and industry – considered by survey-participant experts to be the most energy-efficiency-averse sector – are the sites where EnPCs are most rarely used (0.5/3). Transportation and smart grid projects are marginal but reported as existent.

The most common interventions involve maintenance, replacement of specific elements, installation of renewables and installation of building control systems in both public and private sectors (3/3). These interventions involve, especially in the public sector, monitoring and verification (3/3), energy management, and audits (both 2/3). Integral renovations and interventions in the envelope, as well as demand flexibility and energy storage, are considered rare but exist in both sectors (1/3). As expected in the EC JRC 2021, renewables have gained relevance. Photovoltaic and in some cases geothermal are often combined in interventions of replacing specific elements.

Aligning with the previous situation, the EU Survey 2022 continues to indicate that the Belgian public market mainly relies on guaranteed savings. Shared savings were not reported as relevant in the public sector but are of relative relevance in the private sector market.

Contract duration is reported to be 10 years, and there are large contracts with terms of 15 years e.g. including interventions in the building envelope. Also, new contract variants have been developed to further the depth of interventions within this timeframe.¹⁵⁵

Major data discrepancies among respondents point, according to national expert reviews, to the need for an official registration of EnPC projects as a means to track developments in one such fragmented market.

¹⁵⁴ Alex Geers. 2022. EnPCs: Key for delivering on Europe's climate targets. Frankfurt.

¹⁵⁵ New information points at estimates of 15-year contract duration in the EC JRC 2021 as being overly optimistic, since these project durations are difficult to accept in financial terms.

Table A 9. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Number of contracts 2020-21	50	30	80	The activity in the public sector is most relevant in Wallonia
Overall size m€ 2020-21	150	85	235	There are new projects in large Federal Buildings (EnPC and EnPP) started in January 2022 (over €1b M€).
Typical* size m€	1.5-3	1.5-3	1.5-3	When finance is provided by clients, the size can be smaller (around 1.5m) otherwise it is not feasible for ESCOs to operate below €3m
Typical* duration	10(15)	10(15)	10(15)	15 years when including envelope (difficult financing)
Typical* payback (yrs)	10(15)	10(15)	10(15)	Large projects of 15 years
Typical* % of baseline	30	30	30	Refers to interventions without including envelop
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022).

The market trends, as reviewed in the EU Survey 2022, are represented in the following table.

Table A 10. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Upward	Upward	
Perspective 2022-2024	Upward	Upward	

Source: EU Survey 2022

Status of the business environment

The status of business development, as reviewed in the EU Survey 2022, for the availability of services and engagement of market actors is represented in the following tables.

New developments in the domain of one-stop-shops involve the establishment of a strategy in the Brussels-Capital Region supported by the creation of a market facilitator promoting ESCOs and EnPC to enable the emergence of the services market in the region.

Table A 11. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	10	2.5	2.5	
Facilitators	10	2.5	2.5	100% of public contracts count with facilitation. Private companies do not rely on facilitators. Arbitration is the most common.
One-stop-shops	3	1	2	
Financing actors willing to support EnPC	5	2	2.5	Five of the major banks are considered available for financing and refinancing ESCOs, and some have specific products for this market. Banks have a preference for renewable assets and for public projects.
Other				

Source: EU Survey 2022.

Table A 12. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	2	1.5	2	
Willingness	2.5	2	3	Especially high in Flanders and Wallonia

Source: EU Survey 2022.

Contract modalities and alternatives

The major EnPC contracting modality is guaranteed savings. Facility management (in the forms of Energy efficient facility management and Conventional facility management, intervention, and investment programmes in buildings), as well as direct procurement of equipment, e.g. through leasing, are considered to be the two major competing arrangements with EnPC.

Table A 13. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	3	3	3	
EnPC with shared savings (both parties share the savings, the contractor takes financial risk)	0	1	1	
Build-own-operate-transfer (BOOT)	1.5	1.5	1.5	
Contract energy management (chauffage)	1.5	1.5	1.5	
Facility management	3	3	3	Barrier
Consultancy and technical guarantee	1.5	2.5	2.5	
Energy efficiency improvement contracts	3	2	2	
PPPs	2.5		2.5	
Other	1			Building Performance Contracting (BPC) pursues deep renovations in shorter-term contracts by incorporating the life-cycle benefits of building renovation

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, most instruments were reviewed in the EU Survey 2022 as good or very good. Some exceptions are one-stop shops, information instruments, the use of EEOs and WhCs, and the use of EnPC in fulfilment of the exemplary role of public bodies' buildings.

Table A 14. Perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2.5	Well-established standard EnPC model	-
EnPC Guidelines	2.5	Well-established standard EnPC guidelines	Remaining complexity, especially with increasing performance goals
EnPC Model contracts public sector (whether off- or on-balance sheet)	2.5	Off-balance treatment for local authorities (Wallonia and Flanders) but not at regional and federal levels.	Remaining complexity, especially with increasing performance goals
EnPC Model contracts private sector	3	Yes, from each ESCO	
Lists of EnPC-qualified operators	2		
One-stop-shops	1.5		
Other information instruments	1	The public sector has its internal mechanisms to communicate and adopt EnPC	The government does not inform sufficiently the private sector
EnPC demonstration projects	2	There are public projects getting realised	Need communication and storytelling
Obligation schemes /White Certificates	0.5		EEO schemes, rely on deemed savings
Energy Audits	2.5	public EE facilitators have developed audit standards	Disconnect between audits and investment
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1.5	Walloon and Federal governments use RRP to renovate public buildings through EnPC. Slow process in	The federal government (launching 3 pilots in 2023 estimated to amount €50m, as an intermediate step to implement a €1b program)
Government rules and practices of procurement, contracting and tendering	2	Best in Wallonia	Federal, Brussels and Flemish systems have limitations, e.g. aggregating projects

Source: EU Survey 2022.

Financing

According to the EU Survey 2022, there is a wide array of financing possibilities. Of note, there are no limitations to supporting EnPC projects with grants. As in the previously reported period (2019-20), developed mechanisms such as SPVs and forfaiting are available. A major opportunity reported for improving financing conditions is project aggregation in Flanders, Brussels and the Federal Government. Facilitation, most

developed in the public sector, could also help develop projects in the private sector for these to gain scale and depth.

Table A 15. Financing sources for EnPC projects. Experts responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	3		1.5	
Provider funds	1	2	1.5	
Third-party Public funds	1		1	
Third party Private funds	1	1.5	1	
Private financing inst.	1	1	1	
Public financing inst.	1	1	1	
Debt financing	1	1	1	
Guarantees and guarantee funds	0	1	1	
Equity financing	0		1	
Mezzanine financing	1		1	
Project financing	2		1	
Leasing	0	2	1	
Special Purpose Vehicles	3	2	1	
Grants	1	2	1	
Forfaiting	1.5	1	1	Opportunities for deeper renovation through refinancing
Other			1	Pursuit of models for deeper renovation and shortening projects (e.g. BPC model)

Source: EU Survey 2022.

Barriers

For the period 2019-2021, the major barriers identified in the EU Survey 2022 were the lack of trust from the public sector and the insufficient relevance granted to saving energy in the private sector, along with the administrative costs of EnPC. As for the period 2022-2025, a new barrier was highlighted for the public sector: the pursuit of savings higher than the typical 30% of EnPCs. This is only possible with structural measures with a payback time higher than the contract duration (typically 10 years), such as energy-efficient windows, building envelop insulation etc.

The mild climate, interest in renewables and financing actors' preference for short projects financing limit the introduction of higher savings. Newly introduced subsidies for housing renovation in Flanders and for energy prices at Federal Government (estimated at €1.5b) are problematic for EnPC, both and energy saving, the latter.

Eurostat treatment of EnPC

According to the EU Survey 2022, the Eurostat guidelines on the treatment of EnPC had a limited impact on the sector. The impact is considered to be mildly positive (0.5 on a scale from -2 to +2). Different estimates point at off-balance contracts having low (10-15% of the projects in the public sector) or no relevance in the market during 2020-21. Confusion on the relevance existence of off-balance contracting and its meaning relates to different treatments being granted to local projects, which are considered off-balance at the regional level in Wallonia and Flanders but on-balance at the national level.

Drivers

The major drivers identified in the EU Survey 2022 as relevant for the period 2019-2021 were the activity of public EnPC Facilitators in the public sector and the introduction of obligations on sustainable energy/CO2-reduction, where EnPC is playing a role after having become an accepted contracting procedure, in the private sector. The introduction of new ESG obligations, and concerns about energy prices and real estate value are also drivers in the private sector.

As for 2022-2025, the major drivers are the increasing familiarity of the public sector, especially municipalities, with the model. In the private sector, the drivers existing in the previous period (rising energy prices, ESG, and increased concern about real estate value) are expected to gain relevance.

Previously reported barriers related to lack of political vision and overachievement of EED Art. 5 (JRC 2021) could have been overcome and were not reported in the EU Survey 2022. An improved political commitment could be related to a pursuit of higher project savings, and to a diverse array of actions taken at federal and region levels including consideration given to EnPC in federal and defence renovations, and the strategies for public buildings in Wallonia and Flanders, the availability of subsidies to facilitation in Flanders, the development of facilitation and One-stop-shops capacities in Wallonia, and the creation of a revolving fund for ESCO development and promotion of EnPC in the Brussels Capital Region (NECP, LTRS, Ambience 2021).¹⁵⁶

Although the RRP of Belgium did not emphasize support to EnPC as much as the NECPs and LTRSs. The RPP is perceived as a driver in the EU Survey 2022, largely for its use in Wallonia, in combination with ELENA. Plans for renovating the Federal buildings (€1b) are not specific about the involvement of EnPC. Efforts reported for simplifying administrative procedures may be a relief for complex contractual modalities such as EnPC.)

The regulatory and market context (expertise of ESCOs, existence of facilitation and one stop-shops, development of trust, interest of clients, availability of standard contracts and M&V procedures, existence of aggregation procedures) provides grounds to expect more challenging projects to take place.¹⁵⁷ However, according to the EU Survey 2022 long-term financing is not available for projects with increased targets, duration and risks.

EU support

The most valued EU support mechanism is technical assistance. PDA is considered to be still problematic for projects to access adequate support. The use of EU support for financing is largely unknown to EnPC providers. It is understood that financial support is available to financing actors, and some of the providers receive de-risking support (EU Survey 2022).

¹⁵⁶ <https://ambience-project.eu/wp-content/uploads/2020/10/AmbIENCe-Factsheet-Belgium.pdf>.

¹⁵⁷ [AmBIENCe-Factsheet-Belgium.pdf \(ambience-project.eu\)2020](#)

Table A 16. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition Horizon 2020 Energy Efficiency, PDA H2020	2	0	2	2	Need to adapt PDA to market needs	
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0	0	2		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			0			
InvestEU			0			
RRF	1		0			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0	0	0			
European Green Deal, Fit for 55	1	1		2		

Source: EU Survey 2022.

Perspective

The municipalities, responding to municipal targets of CO2 reduction, have played and are expected to continue playing an exemplary role for other public building owners to follow pace. The private sector is increasingly motivated. Consideration towards the need of pay for performance measures or EE-FIT, and trading of metered savings were reported in the EU Survey 2022. These may be of particular relevance to pursue energy saving rates in building renovation aligned with EU targets.

Recommendations

According to the EU Survey 2022, there is a need to reduce administrative burden, especially problematic in one such fragmented market, and for the experience of the public sector being shared with the private and financing sectors. Pay for performance measures, EE-FIT, and trading of metered savings have been recommended to engage the private sector. The market has been described as having the potential to integrate mandatory requirements for public buildings, and enforcement of ESG rules, as well as to engage with higher targets as far as adequate policy and financing support is put in place (EU Survey 2022, Belesco position paper).¹⁵⁸ Enabling long term financing guarantees, is of interest to sustain deeper renovations in a country with mild climates and where business as usual is not leading to meeting the depth of renovation required to meet EU targets. There are also calls for the registration of EnPC projects, either by Belesco or national agencies because otherwise data on Belgium is scattered and, often, discrepant.

At EU level, recommendations were collected for the development of an EU centre of excellence, for the dissemination of best practices and addressing the risk and return differences between countries should be considered, e.g. relying on the experience of DEEP and EEFIG. Moreover, the EU should better communicate the availability of financing resources available to both the financing and ESCO actors. Fundamentally, the market needs to be steered towards achieving savings aligned with EU targets through information and development of guaranteed mechanisms.

Good practice

New contracting approaches are addressing project duration limitations, e.g. Building Performance Contracting ('BPC'). The BPC-contract still has a contract duration of 10 years but it incentivises at the same time ESCO's realising structural investments with a lifespan of 20, 30 up to 40 years. Indeed, the contract rewards the 'residual value' at the end of the contract, which is typically high for structural investments. As a consequence, ESCO's are motivated realising these investments even if their payback period is longer than 10 years. The approach was demonstrated successfully in 2021 at an EnPC project at the city of Sint-Niklaas in 9 municipal

¹⁵⁸ See Belesco 2022 for a full set of recommendations (<https://www.belesco.be/about-belesco/position-paper/>)

buildings.¹⁵⁹ The guaranteed energy saving (39%) in this project was more than 50% higher than the average energy guaranteed saving in in other Belgian EnPC projects (25%). This contract modality includes improved performance guarantees on maintenance and comfort, and enables circular investments.

¹⁵⁹ <https://factor4.eu/nl/stad-sint-niklaas-bespaart/>

3 Bulgaria

Comparison previous status

Activity in Bulgaria is reported to have slightly reduced in comparison to 2019. In 2018-2019, were reported 10 contracts with a volume of 3 million, and in 2020-2021 the estimates are situated between 5 and 8 contracts with a volume of 2.5 million, all of them taking place in the public sector. (There is also an estimate increase in the number of providers, from above 5 to around 10.) The trend during this period was reported as uncertain, with some respondents to the EU Survey 2022 claiming a downward trend and others speaking of a slow take off, both in the public and the private sector. However, information on the contracts taking place in the private sector was not reported.

Current Status highlights

As reported in the EU Survey 2022, the major sites of intervention are public buildings (rated 3/3), with an emphasis on educational infrastructure, administrative buildings, and healthcare buildings. Interventions in private buildings are less common (1/3), and take place mainly in hotels and office buildings.

Public lighting interventions are a common target of EnPC (2.5/3) and involve both introduction of LED lighting and control systems. Interventions in industry are marginal (1/3) and mainly involve retrofits of lighting and cooling systems. Marginal relevance is attributed to Smart grids, and interventions in the transportation infrastructure. EnPC contracts in buildings tend to include integral renovation, especially in the public sector (2.5/3), the replacement of specific elements, heating and lighting retrofit (2/2), as well as energy management systems (rated 1.5/3 in the public, and 2/3 in the private sectors). Some marginal relevance is attributed to facility management (1/3) and installation of building control systems (1/3), and Installation of renewables in the public sector (1/3). In the private sector, renewables (PV) have greater relevance, and are installed with a model similar to EnPC (3/3). Storage and flexibility capacity are reported as marginal, and in the public sector only where some hydrogen storage projects have taken place (0.5). Audits, monitoring and verification are relatively important part of the EnPC and depending on existence of funds and requirements.

The table below summarizes the data gathered on market and contract sizes.

Table A 17. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	5-8	No info available	5-8	Existence of contracts in the private sector focused on RES, similar to EnPC
Overall size m€	2.5	No info available	2.5	
Typical* size m€	0.3-0.5	No info available	0.3-0.5	
Typical* duration	7-8	No info available	7-8	
Typical* payback (yrs)	6-8	No info available	6-8	
Typical* % of baseline	30-35	No info available		
Typical savings* MWh/year				
Typical savings* m€/year	0.06	No info available	0.06	

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 18. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	
Trend 2019-2021	Downward/ Slow take-off	Downward/ Slow take-off	
Perspective 2022-2024	Slow take-off/ Upward	Slow take-off/ Upward	Depending on implementation of RRP

Source: EU Survey 2022

Status of the business environment

The status of business development, as reviewed in the EU Survey 2022, for availability of services and engagement of market actors is represented in the following tables.

Table A 19. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	9-10	2	2	Usually companies able to implement EnPC as a part of their business
Facilitators	1-5	2	2	
One-stop-shops	0	0	0	Not working with EnPC160
Financing actors willing to support EnPC	2	2	2	BEREEF.
Other				

Source: EU Survey 2022.

Table A 20. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1.5	0.5	0.5	Prevalence of basic models
Willingness	1.5	0.5	0.5	Grants attract most of the interest from clients

Source: EU Survey 2022.

Contract modalities and alternatives

The predominant EnPC is with shared savings – largely because clients expect ESCO financing. EnPC potentially competes with Facility management and Consultancy with technical guarantee and Energy Efficiency contracts, especially in the private sector. PPPs are also of relative importance. In the private sector, there are RES installation contracts which resemble EnPC.

¹⁶⁰ Rodoshop, operating in Rodhope region reports marginal EnPC activity. One-stop-shops development from the RRP is dedicated to residential settings, supported with grants,

Table A 21. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	0.5		In general clients expect the ESCO to provide financing
EnPC with shared savings (both parties share the savings, contractor take financial risk)	2.5	1.5		
Build-own-operate-transfer (BOOT)	0	0.5		
Contract energy management (chauffage)	0.5	0.5		
Facility management	1	1.5		Predominantly in the private sector
Consultancy and technical guarantee	1.5	1.5		
Energy efficiency improvement contracts	2 (1-3)	1.5		Depends on availability of subsidies
PPPs	1	1 (0-2)		
Other				Grants and subsidies, which are not blended with EnPC; Installation of renewables with technical guarantees

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, the most favourably reviewed instruments are model contracts for the private sector, followed by contracts in the public sector, EnPC definitions, demonstration projects, and energy audits which fall in the range of “good” practices appraised by experts in the EU Survey 2022. Guidelines, lists of operators, and EEOs/ WHCs are slightly above the “barely acceptable”, and use of EnPC to fulfil the exemplary role of public bodies’ buildings and the government rules and practices of procurement, contracting and tendering are rated as “barely acceptable”. The worst rated instruments are information and the use of one-stop-shops.

Table A 22. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2		
EnPC Guidelines	1.5	Sustainable Energy Development Agency (SEDA)	More detailed guidelines needed
EnPC Model contracts public sector (whether off- or on-balance sheet)	2	Ordinance of the sector	Ordinance to be expanded
EnPC Model contracts private sector	2.5	Developed by SEDA	Could be further developed
Lists of EnPC qualified operators	1.5		More detailed list needed
One-stop-shops	0.5		
Other information instruments	0.5		
EnPC demonstration projects	2	Public sector	
Obligation schemes /White Certificates	0		EEOS not allowed for EnPC
Energy Audits	2	Well-regulated for grant programs	Low quality, lack of trained auditors
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1		Focus on grants
Government rules and practices of procurement, contracting and tendering	1	Some cases of complex contracts	Preference for simple contracts

Source: EU Survey 2022.

Financing

The Bulgarian Energy Efficiency and Renewable Energy Fund (BEEREF) plays a major role, e.g. by supporting refinancing. There are no restrictions on grant combination with EnPC in the Public Procurement Law but is infrequent, largely due to the sufficiency of grants to cover planned investment and due to complexity of adding guarantee clauses in public procurement contracts. BEEREF support has been commented as not always favourable for municipalities due to the debt ratio requirements.

Table A 23. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate)..

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	2	2	2	Usually equity from the client
Provider funds	1	1	1.5	
Third-party Public funds	3	2	2	Mainly from Public BEEREF and NTEF
Third party Private funds	1	1	1	Banks and private FIs rarely engage in EnPC financing
Private financing inst.	1	1	1	
Public financing inst.	3	2	2	
Debt financing	3	2	3	
Guarantees and guarantee funds	1	1	2	
Equity financing	0	0	1 0	
Mezzanine financing	0	0	0	
Project financing	1	1	1	Only for large infrastructure projects which is rarely the case for ESCOs
Leasing	0	0	2	
Special Purpose Vehicles	1	1	1	
Grants	1	1	1	Compatibility or EnPC was overcome, but grants compete with EnPC
Forfeiting	2	1	1	BEEREF, enforceability is problematic
Other				

Source: EU Survey 2022

Barriers

According to the EU Survey 2022, grants and subsidies are not blended with EnPC and compete for the market in the public sector. Municipalities are concerned about debt and there is uncertainty about possibility to treat EnPC as off-balance debt. Moreover, municipalities are concerned about administrative burden and hence opt for simpler financing and contracts, which are furthermore perceived as less risky. Too this contributes the lack of experience with EnPC and the limited development of the ESCO market in Bulgaria.

Expected barriers for the period 2022-2025 are energy subsidies, possibly the competition with grants and subsidies, and remaining barriers of awareness about the model benefits. There is uncertainty on whether the blended use of RRF alongside EnPC will be permitted, these funds will most likely continue to compete with EnPC if no new measures are introduced about grant allocation (see Recommendations).

Eurostat treatment of EnPC

There has been no apparent development in response to the Eurostat guidelines for the treatment of EnPC in public sector accounts and the impact is considered nil. The Ministry of Finance defined EnPC as not worsening the creditworthiness of municipalities.

Drivers

The major drivers for the upcoming 2022-2025 period were reported in the EU Survey 2022 to be the rapid increase in energy prices and, if materializes, support from RRF.

EU support

Major concern about the use of ESIF and RRF for enabling direct investment which competes with EnPC.

Table A 24. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1	0	1	0	ELENA requirements for CAPEX	H2020 projects
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0	0	0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	-1	0	0	0	Preference for grants, no combination in practice	
InvestEU	0	0	0	0		
RRF	-1	-1			RRF may be deadly for the EnPC model	Not expected
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0	0	0	0		
European Green Deal, Fit for 55	1	0	1			

Source: EU Survey 2022.

Perspective

There is fear that the RRF will go against the development of EnPC and end with prospective development in the future. Moreover, it is argued that direct allocation of RRF funds through grants is a missed opportunity to adapt the building stock to current challenges: "Without co-financing as currently allocated, the grants of the RRF will have a limited impact on Bulgaria's inefficient building stock" (Stoykov, Rakovska and Todorov, 2022).¹⁶¹

Recommendations

The consulted experts as a part of the EC JRC Survey 2022 consider that high grant rates (e.g. 100% for housing renovation based on RRF) should be replaced with financial instrument, including investment grants, that can be implemented via EnPC.

¹⁶¹ Stoykov, Rakovska and Todorov, 2022, A step in the right direction: Bulgaria's recovery plan improved after lengthy negotiations. Bankwatch.

4 Croatia

Comparison previous status

Croatia was reported to be a quite mature and developing market in the period 2018-2019, with most activity taking in public lighting (and hence led by the public sector) and where energy renovation and especially integral refurbishment of buildings tends to be perceived as uneconomic, even though the status of building conservation and the continental climate in large parts of the country advice for deep renovations. There has been a continued development of EnPC projects in public lighting, and on-site renewable generation has become more important but, countering expectations in JRC 2021, the market has shrunk from 50 contracts in 2018-2019, in the public sector only, to around 15 contracts, overall, in 2020-2021. This has been largely attributed to the availability of EU grants available to consumers in the public and private sectors. However, as consulted experts acknowledge, in the absence of a national ESCO association, it is difficult to collect reliable information on the ESCO market development, especially in the private sector.

The NECP and LTRS already recognized the limitations to combine ESIF with PPPs and ESCO models, the need of clear regulation of EnPC and of examples, and the low creditworthiness of ESCOs. LTRS proposed the need of a revolving fund created with ESIF, and the need of standardized contracts for the public sector. However, the RRF pays attention more generally to ESCO models, and recognizes their interest in the deployment of PV, as well as to the combination of ESCO financing with RRF grants, leaving uncertain the role of EnPC. The creation of a National Decarbonisation Fund (NECP) planned in the RRP for 2023 at the earliest can serve to support EnPC financing as proposed in the LTRS but this is not explicit in the plan, and it is possible that regulatory restrictions will not be overcome to support EnPC through the Fund.¹⁶²

Current Status highlights

The major sites of intervention reported in the EU Survey 2022 for Croatia are public lighting (2.5/3), and photovoltaic generation in the private sector (there appears to be newly reported interest in the industry (2/3), where rooftop PV installation has gained relevance. In buildings, replacement of specific elements (2/3) and installation of PV (2.5/3) are the most common interventions (as opposed to integral renovations rated 0.5/3), and often include audit and monitoring and verification actions (both 2.5/3). There are expectations for public lighting to remain important, but EU Grants are a major barrier for public and private sectors to pursue EnPC. According to the EU Survey 2022, there are no projects taking place in public buildings.

The table below summarizes the data gathered on market and contract sizes.

¹⁶² [Renovate2Recover Full-Study-1.pdf \(renovate-europe.eu\)](#)

Table A 25. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	10-20	5	20	Estimates are very variable for the private sector. Need an ESCO association.
Overall size m€	10	2.5		
Typical* size m€	1	0.4		
Typical* duration	10	7		
Typical* payback (yrs)	10	7		
Typical* % of baseline	85			Refers to public lighting (there are no projects in public buildings)
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 26. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Downward	Downward	
Perspective 2022-2024	Downward	Downward	

Source: EU Survey 2022

Status of the business environment

As shown in the table below, the number of facilitators (30) is considered sufficient (3/3) but the number of providers (10) is considered limiting (1/3). There is no One-stop-shops, which can be explained by the sufficiency of facilitation services. The availability of financing actors willing to work with EnPC could be also improved (1.5/3). The quality of services available from providers, facilitators and financing actors was assessed as high but with potential for improvement (2/3).

Table A 27. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	10	1	2	
Facilitators	30	3	2	
One-stop-shops	0			
Financing actors willing to support EnPC	5	1.5	2	
Other				

Source: EU Survey 2022.

Table A 28. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	1	
Willingness	1	1	1.5	

Source: EU Survey 2022.

Contract modalities and alternatives

The predominant EnPC is with guaranteed savings in the public sector. Both shared and guaranteed saving modalities are equally uncommon in the private sector. Energy efficiency improvement contracts compete with EnPC. See table below.

Table A 29. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1.5	1	1	
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	1	1	There was a pilot in a public hospital including photovoltaic plants
Build-own-operate-transfer (BOOT)	0	0	0	
Contract energy management (chauffage)	1	1	1	
Facility management	0	1	0	
Consultancy and technical guarantee	0	0	0	
Energy efficiency improvement contracts	1	2	2	
PPPs	1	0	1	
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, the most favourably reviewed instrument is the development of model contracts for the public sector, and the implementation of audits (both 2), followed by the use of EnPC in fulfilment of the exemplary role of the public sector (1.5/3). Developments in setting new obligation schemes have been diversely valued by respondents to EU Survey 2022 (See table below).

Table A 30. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)		Good practices	Remaining barriers
EnPC Definitions	2			
EnPC Guidelines	1			
EnPC Model contracts public sector (whether off- or on-balance sheet)	2			
EnPC Model contracts private sector	0.5			
Lists of EnPC qualified operators	0.5			
One-stop-shops	0.5			
Other information instruments	1			
EnPC demonstration projects	1(0-2)			
Obligation schemes /White Certificates	1 (0-2)			
Energy Audits	2			
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0.5			Limited use in public buildings
Government rules and practices of procurement, contracting and tendering	0.5			

Source: EU Survey 2022.

Financing

A remarkable financing barrier are limitations for ESCO companies to be beneficiaries of EU funds (only direct financing is supported by EU funds), and complications to implement projects with 2 sources of financing and procurement rules for multi-residential buildings. Possible opportunities include the use of commercial loans at low interest rates. There is also some development in the use of a public fund for energy efficiency to co-finance public lighting. Croatia is amongst the countries where forfeiting is not being used to finance EnPC projects.

Table A 31. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1.5(0-3)	1.5(0-3)		
Provider funds	2.5	0.5		ESCOs finance public lighting
Third-party Public funds	2 (1-3)	2 (1-3)		
Third party Private funds	1.5 (0-3)	1 (0-2)		
Private financing inst.	2	0.5		
Public financing inst.	2 (1-3)	0.5		
Debt financing	2.5	2.5		
Guarantees and guarantee funds	2	0		Public Fund for energy efficiency co-financed ESCO projects in public buildings
Equity financing	0	0		
Mezzanine financing	0	0		
Project financing	0.5	2 (1-3)		
Leasing	0.5	0.5		
Special Purpose Vehicles	1.5 (0-3)	0.5		
Grants	0	0		
Forfeiting	0	0		

Source: EU Survey 2022.

Barriers

According to the EU Survey 2022, there is a need for total energy renovation of buildings, especially public ones, but the long payback periods of these projects is confronted with a limitation to combine EU funds with the ESCO model. There is also a major competition of low interest loans and EU grants, which are available for energy consumers and have limited the availability of public tenders in the period 2020-2021, and the take-off of private markets.

In the period 2022-2024, limitations to combine EnPC with EU funds along with availability of EU grants for EE and RES measures in buildings and industry are expected to continue being the major barriers for the EnPC market of Croatia, even though there are expectations for a lower availability.

Eurostat treatment of EnPC

According to the EU Survey 2022, the introduction of Eurostat Guidance note of September 2017 and the Guide to the Statistical Treatment of Energy Performance Contracts of May 2018 have positively impacted the public sector use of EnPC (impact rated 1.5/3). The adoption of a model for public lighting is highlighted as an example of this. However, the contract model needs to be updated for public buildings. This is important because the Government is interested in deep renovation and, according to national experts, addressing low-lying fruits would lock in the potential to achieve decarbonisation targets in public buildings.

Drivers

According to the EU Survey 2022, a key element of the projects in the period 2020-2021 was the installation of renewables, fostered by the Renewable Energy Directive as of 2018 and reduced price of PV systems. The know-how of ESCOs has been highlighted as a driver. At the same time, Article 7. of the EED has increased pressure on utilities, and an off-balance model contract for public lighting was adopted in 2018.

A major driver in the period 2022-2024 is expected to be the increased energy prices and expected lower availability of grants and subsidized loans in both the public and private sectors.

EU support

The package of the European Green Deal, Fit for 55, and NextGenerationEU is perceived as having a neutral to positive effect (see table below). With the rise of energy prices in 2022, the EU Green Deal is appreciated for its effects in the current and upcoming years. The use of technical support and of ESIF is more controversial, with some experts claiming that these mechanisms have a negative effect.

During the reported period, Croatia received support from the H2020 project E-FIX (2018-2021) which fostered the development of EnPC pilots, leasing and crowdfunding, and training provision on EnPC and project finance. Project Smart-EPC (2022-2025) is supporting the development of Smart EPC concept and contracting. EnPC experiences provided by E-FIX, but outside the reported period include the PV plant in General Hospital Zabok.¹⁶³

Table A 32. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1.5	0	1	1	Only applied in public buildings	
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0	0	0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	-2	1	-1	1.5	Grants did not support ESCO in the public sector. Some grants could be used in the private sector.	
InvestEU	0	0	0	0		
RRF	0	0	0	0		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0	0	0	0		
European Green Deal, Fit for 55	0.5	1		1		

Source: EU Survey 2022.

Perspective

The perspective as recollected in the EU Survey 2022 is uncertain, largely in relation to the availability of EU grants, and their continued competition with EnPC in a context of lack of compatibility between this source of funding and EnPC, and increasing energy prices.

Recommendations

The major recommendations for the Croatian market as collected in the EU Survey 2022 are a) combination of EU support with ESCO financing and development of a guarantee fund (especially for the industry); b) developing an off-balance contract for buildings (focus on integral renovation and exploiting the renewable generation potential); c) creating a national ESCO association (amongst the advantages would be market monitoring).

Regarding the EU, there are calls from national experts for EU grants to be allocated through financing instruments which enable the use of EnPC, e.g., through an EU instruction on the use of EU grants and ESCO models.

¹⁶³ [PowerPoint Presentation \(energyfinancing.eu\)](#)

5 Cyprus

Comparison with previous status

The EnPC market in the public sector of Cyprus was reported as non-existent in the period 2017-2019. Expectations on Cypriot markets for a possible take off seem to have partially materialized in the private sector. On the contrary, expected development of public projects, especially in the domain of public lighting have not yet taken place in 2020-2021.

Current Status highlights

Investment in energy sustainability in Cyprus tends to focus on PV. This can be explained by potential of solar generation and mild winters.

The national registry counted with 10 ESCO providers in June 2022. These are requested to report the EnPC projects conducted.¹⁶⁴ The EU Survey 2022 indicates that currently, less than 5 providers are able to involve in EnPC. There are no facilitators, one-stop-shops nor financing actors willing to support EnPC.

In the private sector there are currently three (3) ESCO contracts being implemented during 2022 in the private sector, and it is unclear whether these projects can be categorized as EnPC. The three projects involve photovoltaics along with smart meters, and one of them also includes upgrades of electromechanical equipment. Information on the first EnPC concluded in Cyprus involved the installation of photovoltaic capacity (300KWh) for a food processing country as a client and an ESCO, as well as private financing from a third-party investor with private funds. The guaranteed performance is 480MWh annually. The economic benefits over grid supply are 10% and imply a reduction in carbon dioxide emissions CO₂ of 364tons per year is also achieved.¹⁶⁵

In the public sector there is a preference for simpler contracting mechanisms (conventional tendering) financed through national and EU resources (mainly grants and loans).¹⁶⁶ Furthering this situation, the RRF provides 100% financing, sending counter messages about the need of engaging private financing to multiply the effect of public funds. Proof of this is the fact that EnPC and ESCOs are not mentioned in Cyprus' RRP (EnPC was mentioned in the NECP, and ESCO was mentioned in the LTRS). Regardless of the acquaintance of public authorities with EnPC,¹⁶⁷ projects involving municipalities and supported by H2020 have not taken off.

The table below summarizes the data gathered on market and contract sizes.

¹⁶⁴ [ΜΗΤΡΩΟ ΠΑΡΟΧΩΝ ΕΝΕΡΓΕΙΑΚΩΝ ΥΠΗΡΕΣΙΩΝ \(11 ΙΟΥΝ. 2022\).pdf \(energy.gov.cy\)](#)

¹⁶⁵ [2018-10-17 FIRST ENERGY PERFORMANCE CONTRACTING E&B \(ENERGY & BEYOND\) - PARADISIOTIS - Green Energy Group \(geg.com.cy\)](#)

¹⁶⁶ Subsidies to energy efficiency have been in place since 2003 and have served to support 30% of insulation (23000 grantees). A current scheme has been supporting 20% of the cost of residential PVs. The scheme is now arriving to tertiary sector. Paybacks of 3-4 years are expected for PVs.

¹⁶⁷ The public sector was supported through Technical Assistance but limited experience in the sector was reported in JRC 2020 to be problematic.

Table A 33. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	0	3	3	
Overall size m€	0	1	0	
Typical* size m€		0.3		
Typical* duration				
Typical* payback (yrs)				
Typical* % of baseline				
Typical savings* MWh/year		500		
Typical savings* m€/year		0.25		10% over grid prices

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 34. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Did not take off	Slow take off	
Perspective 2022-2024	Did not take off	Slow take off	Opportunity in communities

Source: EU Survey 2022

Status of the business environment

The tables below show that there is a limited sufficiency of providers but these are able to supply good quality services, and that there is willingness of the public sector clients to engage with EnPC. All other market conditions indicated regarding facilitation services, one-stop-shops, private clients and financing actors are perceived as having limited capacity to enable the development of the market.

Table A 35. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	4	1	2	
Facilitators	0	0		
One-stop-shops	0	0		
Financing actors willing to support EnPC	0	0		
Other				

Source: EU Survey 2022.

Table A 36. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	1	
Willingness	2	1	1	

Source: EU Survey 2022.

Contract modalities and alternatives

The predominant EnPC model is with shared savings (See table below). Both shared and guaranteed saving modalities are equally uncommon in the private sector. There are no alternative contracts reported which compete with EnPC.

Table A 37. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	0	0	
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	1	1	There have been attempts to incorporate EnPC in public lighting. Three private projects identified
Build-own-operate-transfer (BOOT)	0	0	0	
Contract energy management (chauffage)	0	0	0	
Facility management	0	0	0	
Consultancy and technical guarantee	0	0	0	
Energy efficiency improvement contracts	0	0	0	
PPPs	0	0	0	
Other				Direct contracting is the most common mechanism

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, limited insight was received through the EU Survey 2022. The most appreciated measure is the publication of a list of ESCOs, which furthermore report annually on the EnPCs signed. Guidelines, model contracts, demonstration, and fulfilment of the exemplary role of public bodies' buildings are areas that require development (See table below).

Table A 38. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions			
EnPC Guidelines	0		
EnPC Model contracts public sector (whether off- or on-balance sheet)	0		
EnPC Model contracts private sector			
Lists of EnPC qualified operators	2		
One-stop-shops			
Other information instruments	0		
EnPC demonstration projects	0		
Obligation schemes /White Certificates	0		
Energy Audits			
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		
Government rules and practices of procurement, contracting and tendering			
Impact of EnPC in public sector performance			
Impact of EnPC of public sector on private sector adoption of EnPC			

Source: EU Survey 2022.

Barriers

Market development of energy performance solutions is largely determined by geographic specificities of scale, mild climate (i.e. small heating bills) and seasonal use of cooling systems (two - threemonths a year, summer hospitality). The photovoltaic potential as compared to energy efficiency improvements, together with availability of targeted grants has taken away a large portion of the potential for EnPC which is not the favoured option due to its higher transaction costs. Adding to this low potential in buildings, solar thermal was largely mainstreamed in the past (solar water heating in 96% of residential, and around 60% of hotels).

The public sector, furthermore, is a largely fragmented market, and municipalities have limited administrative, technical and financial capacities. Municipalities tend to formulate tenders for services and pay these with the support of favourable loans from the Government. Further adding complexity to EnPC as compared to its alternatives, maintenance contracts in the public sector buildings continue – as in 2019- to be a barrier, hence adding an advantage to PVs developments (as opposed to efficiency, renewable generation can be administered without involving changes in maintenance of buildings). According to the [“Integrated National Energy and Climate Plan”](#)¹⁶⁸ the major barriers have been: lack of appropriate forms of finance, the lack of standardization, the inexperience of actors, the mistrust from the (potential) clients, the perceived business and technical risk, the small size of the projects and the high transaction costs, as well as need to remove procurement hurdles for energy efficiency services in the public sector. The fulfilment of the exemplary role of government buildings is achieved through conventional tendering. Moreover, the drafting of model contracts and tendering guidelines has been postponed due to Covid (to be drafted in 2023) and there is an inefficient contract enforcement – as stated in the national RRP.

Developments in public lighting could be jeopardized by its management being dependent on the Electricity Authority of Cyprus, which owns 75% of the lamp poles and operates public lighting for municipalities (provision of lighting services).¹⁶⁹ There is a risk for a missed opportunity in the domain of public lighting.

¹⁶⁸ [“Integrated National Energy and Climate Plan”](#).

¹⁶⁹ Cyprus Energy Agency. 2013. Energy Performance Contracts. Street Lighting Pilot Project in Cyprus. [Microsoft PowerPoint - 2013 - 05 - 16 - Street Lighting Cyprus medeea \(cyprusconferences.org\)](#)

Driven by the EU phase out of incandescent bulbs and rising energy prices, projects for the renewal of street lighting in major municipalities are being tendered, e.g. in Nicosia, Athienou – with support of an EIB loan– with no reference to EnPC.¹⁷⁰ This is also the problem with the Sustainable Energy Action Plans drafted by 16 major municipalities in participating in the Covenant of Mayors or the Pact of Islands.

Financing

The major sources of financing on which market development is expected to rely is client funds and public financing for the public sector and private (third-party) financing for the private sector. There are also expectation for the combined use of grants and soft loans in combination with EnPC.

Table A 39. Financing sources for EnPC projects. Projects reviewed and Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 =uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1		0	Attempted projects and expectations
Provider funds			0	
Third-party Public funds			0	
Third party Private funds		1	0.5	Based on only case description found
Private financing inst.			0	
Public financing inst.	1		0.5	There is a potential for the use of grants and soft loans to support EnPC
Debt financing			0	
Guarantees and guarantee funds			0	
Equity financing			0	
Mezzanine financing			0	
Project financing			0	
Leasing			0	
Special Purpose Vehicles			0	
Grants			0	There is a potential for the use of grants and soft loans to support EnPC
Forfeiting			0	
Other				

Source: EU Survey 2022 and review of reports of existing projects.

Eurostat treatment of EnPC

Changes and clarifications on the **Eurostat treatment of EnPC** in government accounts are of little relevance for a market with preference for the installation of renewables.

Drivers

For years central government bodies, the national electricity company and municipalities have shown commitment towards EnPC. Yet, to date the drive of authorities has been insufficient to overcome a largely adverse context and joint projects have failed to overcome financial costs in the past. With an electricity price around the EU average for household consumers and well above the EU average for non-household consumers (second highest prices in the EU), Cypriot decision makers may become motivated to implement

¹⁷⁰¹⁷⁰ [street lighting | \(cyprus-mail.com\); Nicosia is changing 100% of street lighting with LED | ManagEnergy; Energy efficient street lightning in Nicosia's villages | Interreg Europe - Sharing solutions for better policy](#)

performance improvements.¹⁷¹ Current response to price fluctuations during 2022 has not been reported. Mutual Funds Fund from CF, ERDF, EIB and national budget can be used for supporting ESCO and EnPC projects and auditing. Without additional driving efforts may support conventional contracting.¹⁷²

Efforts of demonstration and guidance have been postponed and are now planned for 2023. New support schemes in the form of subsidies and grants available for 2022 and 2023 will support households and SMEs to invest in renewables and efficiency. Based on information available ESCOs may be involved in the project implementation, e.g. in the audit process.¹⁷³ A new support scheme will aim at deep energy renovation of residential buildings. The integration of EnPC could be an opportunity. MECI is currently preparing template procurement documents for EnPC in the public sector. These documents will be communicated to public and wider public authorities in order to facilitate them, accompanied with a brief step by step guide for each tendering procedure.

EU support

Technical development and research projects supported by the EU are of interest for the potential the EnPC model to potentially take off. The H2020-supported PEDIA project (2020-2025), which intends to renovate 25 schools to NZEB standards through was reported to aim at including experiences with EnPC.¹⁷⁴ However recent information on the project do not refer to EnPC. The H2020 project NEON (September 2021 - 29 February 2024) counts with participation of the University of Nicosia intends to develop innovative contracting models for the integration of EnPC and P4P schemes and establish innovative M&V methodology. The relevance of the project for Cyprus' market development is uncertain in available information about the project.¹⁷⁵ However, the overall impact of EU support has not yet resulted in contracts nor the use of investment grants that crowd the market.

Perspective

The development of model contracts for the public sector and previous experiences may result in EnPC contracts to take off in the public sector and efforts to continue to develop in the small private sector market. Structural issues of climate and reliance on grants and loans difficult however the development of these markets.

Recommendations

There is a fundamental need for resolving contract models, guidelines and contract enforcement issues, along with regulatory or economically incentivised preference for guaranteed savings appear necessary to exploit the benefits of EnPC. Regulatory signals could include requirements for public sector to work with guaranteed savings in implementation of EED Art. 5. Furthermore, ongoing efforts in fostering EnPC would benefit from enabling technical (facilitation) as a means to address issues of trust and technical capacities.

A series of good practices highlighted in the EC review of the LTRs can be of relevance to foster future developments of EnPC: the creation of an energy efficiency obligation scheme, which is expected to attain 41% of Article 7 commitments through improvements in energy efficiency in residential, commercial, industrial and transport sectors, the combination of structural (seismic) and energy upgrade, a green tax reform which will include carbon pricing, and incentives for energy upgrades in building renovations. Fundamentally the use of grants and loans should be channelled through EnPC for its markets to take off.

There is a continued potential for EU technical support for project development and the development of one-stop-shops or facilitation.

¹⁷¹ Data consulted for the second half of 2021 [Electricity price statistics - Statistics Explained \(europa.eu\)](#)

¹⁷² The use of EU Schemes for the tertiary sector alongside EnPC is possible. However, this option may not be the most attractive for clients which once have secured the funds may not be interested in additional contracting efforts, especially given the limited saving potential in the country, hence reducing the interest of additional and guaranteed savings, e.g. through EnPC. Street lighting interventions with grants and loans has enabled the replacement of more than 150,000 lamps in around 300 communities.

¹⁷³ [Funding Programmes, Ministry of Energy, Commerce and Industry \(meci.gov.cy\)](#)

¹⁷⁴ [Promoting Energy efficiency & Developing Innovative Approaches in schools | PEDIA Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\); swd_commission_preliminary_analysis_of_member_state_ltrss.pdf \(europa.eu\)](#)

¹⁷⁵ [Next-Generation Integrated Energy Services for Citizen Energy Communities | NEON Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)

6 Czech Republic

Comparison previous status

A public sector market reported as mature and developing in the JRC report of 2021, during the period 2020-2021, the public EnPC market of the Czech Republic dramatically increased regardless that engaging EnPC is not allowed for central government entities. This marked development was largely enabled by EU and State programs which require an EnPC test for the allocation of Cohesion Funds (Operational Program Environment).¹⁷⁶ The private sector market has remained stable. Whilst the market size contracted with Covid, the availability of business infrastructure in terms of providers, facilitators and financing, largely supported by forfeiting, shows an optimistic situation.

Current Status highlights

The Czech government has largely recognized the relevance of EnPC to maximise the efficient use of funds, and has a will to diversify financing, as stated in the LTRS. References to EnPC are relevant in the NECP and LTRS. The Government has allocated efforts to training on tendering EnPC for public and commercial buildings (EFEKT), supports free consultation centres that assist in the preparation and documentation of EnPC projects (EKIS), the documental preparation of projects is subsidized, and there is a government-organized organized M&V system (NECP; LTRS).

The Country's RRP is amongst the few making explicit reference to EnPC. Relying on experience in the allocation of Cohesion Funds, the national RRP includes support to the new EnPC model from the first RRF instalment and a bonus for savings from EnPC or Performance Design & Build method. Indirect measures that may support the development of EnPC markets is RRF investment in speeding administration, development of green procurement criteria, training to contractors and financial support to SMEs. These investments are of relevance because the need of stronger TA, and speeding decisions had been identified as key barriers in the previous reporting period (2017-2019).

The typical intervention sites in Czechia are public schools, hospitals and theatres. Currently, private offices are, although rare, the most common private intervention site alongside industrial interventions. Municipal and regional projects take place in the form of project pools. Public lighting projects are included in these pools. Interventions in district HVAC, smart grids and transportation are now considered irrelevant in the market.¹⁷⁷ Private office buildings and district heating appear to have lost relevance.

Main intervention typologies are the replacement of specific building elements (boilers, HVAC, lighting, and overall systems), the installation of integral control systems, and integral renovations, both in the public and private sectors. Whenever it is economically repayable, projects also support the installation of on-site renewable generation, and storage capacity. Maintenance is contracted only as a part of the warranty obligations, and **maintenance and replacement of equipment is not covered by providers**. Integral renovations, integral control systems, generation and storage seem to have gained relevance respect to the previous reporting period (2017-2019). Integral renovations and envelope interventions have become possible since 2019, when subsidies became available.

The table below summarizes the data gathered on market and contract sizes.

¹⁷⁶ [Microsoft PowerPoint - Seminar EPC Praha 150527_6_Vrbicky_pravidla_PO5 \(svn.cz\)](#)

¹⁷⁷ These values are similar to those obtained in 2020.

Table A 40. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Number of contracts	11	2	13	
Overall size m€	27	1.2	28.2	
Typical size m€	1.8	0.6	1.6	0.2-10
Typical duration	10	5	-	
Typical payback	8.5	8.5	8.5	Longer projects of 14-18 years are implemented with subsidy support
Typical % of baseline	30	30	30	
Typical savings MWh/year				
Typical savings m€/year	0.21	0.07	0.19	0.02 -1

Source: EU Survey 2022

Table A 41. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Rocketing	Stable	Rocketing trend in the public sector was caused by new state & EU subsidies
Perspective 2022-2024	Upward	Slow take-off	Slower effect of subsidies

Source: EU Survey 2022

Status of business environment

As shown in the tables below the provision of services and the willingness of actors to engage the market is not problematic, with the exception of the private sector clients. The level of understanding from the central administration has to an extent improved, and there indications of attempts to test off-balance approaches in central government buildings. This could potentially lead to the lifting of the veto of the MoF on EnPC. Because of the latter, the current and previous use of EnPC to fulfil the exemplary role of the public sector (Art 5 EED) is limited, which is problematic in a context shaped by lack of trust in the model.¹⁷⁸ However, forfaiting has consolidated during the reported period, enabling long term financing for EnPC (EU Survey 2022).

Table A 42. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency	Quality	Comment
Providers	10	3	3	
Facilitators	11	2	3	
One-stop-shops	-	-	-	
Financing actors willing to support EnPC	3	3	3	
Other	-	-	-	

Source: EU Survey 2022.

¹⁷⁸ Energy service providers interviewed rated the impact of public sector adoption of EnPC adoption in the public sector is rated 2 (between 0 and 3), and on the private sector as 0 (between 0 and 3).

Table A 43. Understanding of the willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	2	1	3	
Willingness	1	0	3	Renewed interest from the central government to implement off-balance contracts

Source: EU Survey 2022.

Contract modalities and alternatives

A combination of guaranteed and shared savings modalities whereby the first rank of savings is guaranteed and extra savings are shared is widespread in the public sector. EnPC is less common in the private sector. Boot and Facility management are considered to compete with EnPC for the market (See table below).

Table A 44. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private		Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	3	1		Typical EnPC contract is guaranteed energy savings and shared "extrasavings".
EnPC with shared savings (both parties share the savings, contractor take financial risk)	3	1		Typical EnPC contract is guaranteed energy savings and shared "extrasavings".
Build-own-operate-transfer (BOOT)	1	1		Competes with EnPC
Contract energy management (chauffage)	0	1		
Facility management	1	2		Competes with EnPC
Consultancy and technical guarantee	0	0		
Energy efficiency improvement contracts	0	0		Besides EnPC
PPPs	0	0		Not yet in use for energy efficiency
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, most instruments were rated as "very good" or "good" with the exception of energy audits, obligation schemes and the use of EnPC in fulfilment of the exemplary role of public bodies' buildings, apparently because most interventions are not implemented in obligated buildings, i.e. from the central government and of a sufficient size.¹⁷⁹ Good practices identified are the EnPC definitions (rated 2/3), guidelines (rated 2/3), model contracts (rated 3/3), demonstration (2/3), as well as guidelines (2/3) and the government rules and practices of procurement, contracting and tendering (2/3). About 10 projects are considered to be especially attractive for having a demonstrative value. According to national service providers, all of these practices have received adequate support from communication and pilot projects. This

¹⁷⁹ One-stop shops were not rated by respondents

is remarkable because the insufficiency of government communication had been highlighted as a barrier in the previous reporting period (2017-2019).(See table below.)

Table A 45. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)		Good practices	Remaining barriers
EnPC Definitions	2			
EnPC Guidelines	2			
EnPC Model contracts public sector (whether off- or on-balance sheet)	3			
EnPC Model contracts private sector	3			
Lists of EnPC qualified operators	3			
One-stop-shops				
Other information instruments	3		Promotion activities	
EnPC demonstration projects	3		Pilot projects	
Obligation schemes /White Certificates	0			
Energy Audits	1			
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1			
Government rules and practices of procurement, contracting and tendering	2			

Source: EU Survey 2022.

Financing

Financing originates mainly from client funds in the private sector and either from client funds or from other public funds in the public sector. Public financing is also widely used in the private sector. Forfeiting is a widespread mechanism, especially in public contracts.

Table A 46. Financing sources for the EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Client funds	1	2	-	
Provider funds	0	0	-	Short-term financing
Public funds	3	1	-	
Private funds	0	0	-	
Private financing inst.	0	0	-	
Public financing inst.	3	3	3	
Debt financing	0	0	0	
Guarantees and guarantee funds	0	0	0	
Equity financing	0	0	0	
Mezzanine financing	0	0	0	
Project financing	0	0	0	
Leasing	0	0	0	
Special Purpose Vehicles	0	0	0	
Grants	2	1		
Forfeiting	3	1		Long-term financing

Source: EU Survey 2022.

Barriers

According to the EU Survey 2022, the major barrier identified by services providers is Eurostat categorization of receivables as public debt, which remains an obstacle for government bodies. The major barriers in the private sector are long payback periods, and the categorization of receivables as CAPEX. The impact of the Eurostat changes in accounting rules had a large negative impact (-2 in the range from -2 to +2). Major delays in the choice of a model result from the pursuit of an adequate balance between the interests of clients and contractors, largely because providers are not interested in taking over maintenance risk, which is needed for the contract to be accepted as off-balance within Eurostat rules.¹⁸⁰

The most relevant barriers for the period 2022-2025 are the low motivation of civil servants in the public sector, and the veto on central government buildings. In the private sector, the major barriers continue to be long payback periods, and the inclusion of receivables into CAPEX.

Drivers

The key drivers in the public sector for the period 2019-2021 have been energy costs, the decarbonisation drive and the introduction of subsidies to support EnPC projects, enabling deep renovations whilst keeping contracts within a 10-year duration, along with the use of forfeiting. The same drivers are expected to drive market activity in the period 2022-2025 (EU Survey 2022). Moreover, in the period 2022-2025, it is expected that integral renovation projects gain relevance as the result of requirements for Performance Design and Build project.

EU support

A review of the Czech implementation of the EU regulatory framework (EU Survey 2022) shows that previous barriers towards the combination of EU funds and EnPC have been overcome. Currently there are two ELENA projects, one in Central Bohemia and one with the National Development Bank. Furthermore, there are expectations for EIB Support for market assessment and development of a forfeiting guarantee scheme in the Czech Republic, which could drive the further development of the EnPC model in Czech Republic. (See table below).

¹⁸⁰ The existence of investment grants which compete with for buildings was also highlighted as a barrier in the LTRS. This barrier has been largely overcome through combined use of Cohesion Funds with EnPC and the continued development of forfeiting, which enables long term financing.

Table A 47. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public		Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	2		0	2	1	Administration	-
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0		0	0	0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	2		1	2	0		Since 2020
InvestEU	0		0	0	0		
RRF	2		0	0	0		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0		0	0	0		
European Green Deal, Fit for 55*	0		1		2		

Source: EU Survey 2022.

Perspective

For the period 2022-2025, an upward trend is expected in the public sector (the market size has increased compared to the previous period) alongside a slow take-off (i.e. from a temporarily halted market) in the private sector. A major reason for reduced growth in the public sector is the reduced effect of subsidies amidst RRP implementation. However, integral renovation projects are expected to gain relevance as the result of requirements for “Performance Design and Build”.

Recommendations

A set of key recommendations have been gathered from national experts and reviewers of Czech market:

- Removal of the veto on central government investment would be a key regulatory signal. This could serve to use EnPC to fulfil central government’s obligations in implementation of EED Art. 5, based on the experience of other public bodies.
- Continuation of project preparation support from ELENA would serve to increase the amount of EnPC projects procured.
- Continuation of the combined use of EnPC with EU subsidies and requirement of EnPC-testing of projects.
- Development of contract models that do not account receivables as CAPEX for the client (e.g. EEaS model) would help develop the private market.
- Extension of the forfeiting model to clients with lower credit ratings, through a public guarantee, would serve to increase the eligible pool of projects.

Even in a most developed market such as Czechia, continued EU support through ELENA, the allocation of funds through mechanisms that support deep EnPC renovations such as guarantee funds, and technical support of the EIB to develop refinancing mechanisms would be favourable to the EnPC market and to the achievement of energy saving and decarbonization targets.

7 Denmark

Comparison previous status

The public market was consistently growing from 2008 to 2019 before slowing down. A small but stable private sector market was driven by a focus on payback periods and positive business plans. The NECP emphasized EnPC, and efforts on informing municipal and regional authorities on the advantages of the model. However, as mentioned in the LTRS, EnPC is of limited relevance in the public sector due to access to advantageous financing from Kommunekredit. Indicating a potential for developing EnPC, the LTRS mentions the availability of mechanisms for aggregation, e.g. Gate 21 in the Copenhagen region, advisory services (BetterHomes, SparEnergidk, and Danish knowledge Centre for Energy Savings in Buildings, and grant allocation which incentivises the greatest documented savings, hence potentially incentivising EnPC (Fund for Energy Savings in Buildings and Fund for Energy Savings in Business). However, the Danish RRP did not refer to EnPC nor ESCO models, and was reviewed by the EC as potentially needing increased investment on EE.¹⁸¹ There are no binding savings goals for public bodies and the most common approach to saving energy interventions is to implement small interventions through in-house capacity.

Current Status highlights

The market has contracted in the public sector and remained stable in the private sector, where little activity takes place. There are expectations for take-off in both sectors as the result of renewed building renovation, energy saving and climate-related targets.

The most common contracting model reported in the EU Survey 2022 for Denmark in EnPC with guaranteed savings (3/3) in the public sector. The use of the model is limited in the private sector (1/3) where EnPC is considered to be a novel mechanism. Other model contracts used are consultancy with technical guarantee and energy efficiency improvement contracts (both rated 3/3 for both public and private sectors), which compete with EnPC. Facility management is also common in large private companies (2/3) and to an extent in the public sector (1/3).

The most common intervention sites are public buildings (rated as 2/3), mainly universities, municipalities and hospitals (2/3). Smart grids, industry (pharma, and food and beverage), and private buildings (shopping malls, especially) are of relative relevance (the three of them rated 1/3). The most common types of EnPC contracts involve maintenance, installation of building and plan control, energy management, renewable generation and Monitoring and evaluation (all of these rated 2/3). Integral renovation is relatively less frequent (1/3). And storage is expected to gain relevance in the near future.

The table below summarizes the data gathered on market and contract sizes.

¹⁸¹ [Denmark's National Recovery and Resilience Plan \(europa.eu\)](https://european-council.europa.eu/media/en/press-room/pages/press-room-detail.aspx?lang=en); [Denmark's recovery and resilience plan | European Commission \(europa.eu\)](https://ec.europa.eu/eip/eip-efr/)

Table A 48. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	8	7	15	
Overall size m€	25	10	35	
Typical* size m€	7	1.5		
Typical* duration	5	2		
Typical* payback (yrs)	20	8		
Typical* % of baseline	20	25		
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022

Table A 49. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Downward	Stable	The public sector has no binding goal for energy efficiency. The private market is focusing on electrification and energy efficiency but are not familiar with EnPC
Perspective 2022-2024	Slow take-off	Slow take-off	

Source: EU Survey 2022

Status of the business environment

The sufficiency of provision and facilitation was rated in the EU Survey 2022 as limited (both 1/3). The financing sector the latter shows to have sufficient capacity to engage with EnPC, and has greater understanding and willingness to work with EnPC than private and public clients. Facilitation services are also of good quality but, the same as providers, insufficient for the market development (especially in the private sector, where actors appear to be relatively willing to engage EnPC).

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 50. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	2	1		
Facilitators	3	1	2	
One-stop-shops	-	-	-	
Financing actors willing to support EnPC		3	2	Public financing has some limitations
Other				

Source: EU Survey 2022.

Table A 51. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	3	"The public sector knows the EnPC model but is not used so often anymore. It is new to the private market"
Willingness	1	2	3	

Source: EU Survey 2022.

Contract modalities and alternatives

The main contracting modality for EnPC is guaranteed savings, mainly in the public sector. Facility management, and especially consultancy with technical guarantee, and energy efficiency contracts are widespread. These compete with EnPC because clients are more familiar with these models than with EnPC. (See table below).

Table A 52. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private		Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	3	1		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	0		
Build-own-operate-transfer (BOOT)	0	0		
Contract energy management (chauffage)	0	0		
Facility management	1	2		Widespread amongst biggest private companies
Consultancy and technical guarantee	3	3		
Energy efficiency improvement contracts	3	3		Single measures without guaranteed savings
PPPs	0	0		
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, the most favourably reviewed instruments were government rules of procurement, contracting and tendering, energy audits, and demonstration projects, which are publicized in the webpage of the Danish Energy Agency. Although off-balance contracting is not so relevant for the public sector, off-balance models could be of interest for the private sector.

Table A 53. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	1		
EnPC Guidelines	0	New working group created guidelines for municipalities in 2022. ¹⁸²	
EnPC Model contracts public sector (whether off- or on-balance sheet)	0	Off- balance treatment is not so important for public sector	
EnPC Model contracts private sector	0		There is a public incentive for the private market, but does not support off-balance financing
Lists of EnPC qualified operators	1	The Danish Energy Agency has a ESCO site	
One-stop shops	1	Two private ESCOs were referred as One-stop-shops by some respondents	
Other information instruments	1	Database of energy management , information about ESCO on SparEnergi.dk	
EnPC demonstration projects	2	ESCO site of the Danish Energy Agency refers to 20 municipalities, 2 universities and 12 hospitals where EnPC was implemented	
Obligation schemes /White Certificates	1	Obligation-based fund no longer in use	
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		
Government rules and practices of procurement, contracting and tendering	2		
Impact of EnPC in public sector performance	1		
Impact of EnPC of public sector on private sector adoption of EnPC	1		

Source: EU Survey 2022.

Financing

As show in the table below, EnPC financing is advantageous for municipalities, whose financing limitations set by the government can be overridden in case of EnPC financing. Most financing for public projects comes from public funds (rated 3/3), as in the case of Kommunekredit for municipalities, often times in the form of

¹⁸² [hvad-skal-kommunen-overveje-foer-et-esco-samarbejde.pdf \(kl.dk\)](#)

leasing (2/3). Private projects are mostly financed through private banks and client funds (both rated 2/3). There is a public incentive for the private market, but does support off-balance financing, and is incompatible with some private financing instruments.

Table A 54. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1	2		
Provider funds	0	1		
Third-party Public funds	3	0		Kommunekredit could support EnPC but is preferred over EnPC
Third party Private funds	0	2		Banks for private
Private financing inst.	0	2		
Public financing inst.	3	0		There are public incentives for the private sector to engage with EnPC
Debt financing	0	0		
Guarantees and guarantee funds	0	0		
Equity financing	0	0		
Mezzanine financing	0	0		
Project financing	0	0		Some actors are offering off-balance financing (incompatible with public incentives)
Leasing	2	0		Kommune kredit for public sector
Special Purpose Vehicles	0	0		
Grants	0	0		
Forfeiting	0	0		
Other				

Source: EU Survey 2022.

Barriers

Aligning with previously reported situation (JRC 2021), the major barriers in the public sector reported in the EU Survey 2022 for the period 2019-2020 include competition of public financing and direct implementation. Also, were identified as barriers a lack of binding EE goals already problematic in the past, and a preference for PV. In the private marked an increased focus on electrification and energy efficiency is not matched by familiarity with the EnPC model, and furthermore there are concerns about long return periods. In the upcoming period 2022-2024, government interest for PVs and continued concern amongst private investors about payback periods are expected to continue limiting market development. Off-balance financing is attractive for the private sector and can be an opportunity for the adoption of EnPC, however it has been reported as largely incompatible with public incentives.

Eurostat treatment of EnPC

Off-balance contracting is not relevant for the public sector (EU Survey 2022). EnPC financing does not account towards the debt of local authorities. It is more interesting for the private sector, mainly in the industry. However, off-balance models are incompatible with government subsidies.

Drivers

According to the EU Survey 2022, the major drivers for an expectedly slow take-off of EnPC in both public and private markets are renewed preoccupation for climate change, increasing costs of CO2 emissions and energy costs (especially of gas, i.e. electrification drive). For instance, private companies are signing up to science-based targets. The EU focus on EE is expected to partially compensate for government focus on wind generation and district heating. Public incentives for the private sector is expected to enable the acceptance of longer payback periods. There is going to be a greater focus on electrification due to CO2 reduction and gas crises and energy efficiency due to energy prices and CO2. Public incentives in place are expected to extend the payback period of private projects.

EU support

EU Support mechanisms, with the exception of technical support to the public sector (rated 1 in a -2, +2 scale) are considered by consulted experts to have nil effect on the EnPC market of Finland. The only identified capacity development H2020 project implemented during the researched period include SENSEI (2019-2022), which has worked on developing concepts and business models for pay for performance (P4P) retrofits. (See table below.)

Table A 55. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1	0	0	0		
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0	0	0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	0	0	0			
InvestEU	0	0	0			
RRF	0	0	0			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0	0	0			
European Green Deal, Fit for 55	0	0	0			

Source: EU Survey 2022.

Perspective

There are expectations for EnPC development in the near future. Flexibility and storage capacity is expected to further gain relevance, as also PV is developing.

Recommendations

Experts participating in the EC JRC Survey 2022 have recommended the establishment and active promotion of targets by the government and energy agency. For sectoral actors, there is a need of government support to the EnPC and other ESCO models as a means to speed up investment and to achieve targets in energy efficiency and carbon neutrality. A suggested mechanism was subsidies, e.g. for audits, that incentivise the choice of EnPC. The private sector would benefit of financing instruments that substitute subsidies to enable off-balance treatment of EnPCs.

At EU level, the promotion of EnPC as a mechanism with more advantages than financing is key for markets with sufficient access to financing to develop.

8 Estonia

Comparison previous status

In previous and current gathering of expert insight, it has been difficult to engage the Estonian sector to provide expert input. Expert input on the period 2020-2021 covered in this report was not available. Previous reporting indicated that guidance for the preparation of “energy efficiency contracts” was available (2019) and a first project was concluded.

A key area of interest for EnPC in Estonia are multiapartment buildings. In 2015, it was assessed that almost 71% of the Estonian population lives in multifamily buildings built between 1961 and 1990. These buildings have precarious energy performance and indoor comfort conditions, and they need structural repairs. Although these buildings have a technical energy savings potential of 3.74 TW h/a in terms of final energy use, the necessary investments have a return period of 20 years. Moreover, residential owner-dwellers have limited investment capacity, and are reticent to renovate and engage with EnPC.¹⁸³ In 2018, a renovation to NZEB standard which addressed full renovation of multifamily buildings in Estonia, found a 34% gap between the designed and measured primary energy consumption (i.e. between 95kWh/m²year and 147kWh/m²year, respectively)¹⁸⁴, showing the importance of contractual guarantees.

The NECP and LTRS have showed interest for ESCO, but not to EnPC. The NECPs pays attention to ESCO models. According to the NECP there is 6 companies providing Energy services in Estonia (F Adven, Fortum, MTÜ Eesti Energiasäästu Assotsiatsioon, Soletek, AU Energiateenus OÜ, Eesti Energia). In 2019, a collaborative development of ESCO contracts took place. A landmark of the NECP is the government plans to make support housing associations through KredEx Fund185. Although the fund does not appear to exclude ESCOs from implementing the projects, the effect of this policy in the ESCO and EnPC market is uncertain.

Further support to financing of energy renovation of buildings was mentioned in the LTRS, alongside PPP. Financing instruments included support to lending for energy renovation of buildings, and measures addressed to the “reduction of possible investment risks, financial support and creation of a revenue base needed for financing the measures” This measure appears to have materialized in funding from the State Shared Service Centre, which provided financing to local authorities between 30 and 70% of the investment, and a capped investment (€700/m²) for central government entities to building renovations and construction of NZEB buildings during half a year, by the beginning of 2019.¹⁸⁶ Whilst there is a need of further information on the extent the government succeeded to create a revenue base for financing efficiency and to mitigate investment risks of relevance for EnPC, there is no information on any EnPC having taken place in the country. Most recently, the RRP has paid no explicit attention to EnPC common.

Current Status highlights

Based on the available literature and the lack of interest of stakeholders to provide input to this report, it is arguable that unclear commitment of decision-makers and lack of capacities have resulted in insufficient grounds for the market to take off. There are reports of two municipalities actively using EnPC but their contracts seem to have taken place before the research period (2020-21).¹⁸⁷ The main experience with EnPC found in the country relates to the H2020 project EFFECT4 (2017-2020), which assessed the country potentials for energy efficiency renovation of buildings, and supported pilots involving BMS and energy monitoring in public buildings during 2018 and 2019.¹⁸⁸ The project provided a toolbox for EnPC development, including a template contract for EnPC and EnPCM.¹⁸⁹ Two cases were implemented covering 10,000 m² and with an investment of €2m. The average savings guarantee was 30%, and the achieved savings of 30%, over

¹⁸³ [Pikas et al 2015](#) found that: “ a non-energy efficiency related investment of 31€ /m² would lead to the same cost as an integrated renovation at 160€ /m²”.

¹⁸⁴ Green Home Energy Efficiency for Homeowner Associations. Nd. Good Practice Factsheet. Akadeemia 5^a. Serial refurbishment of a dormitory. Tallinn, Estonia.

¹⁸⁵ The fund was available from 2018 up until the exhaustion of funds. The programme “Subsidising energy efficiency solutions” planned to support projects involving buildings with at least “C” energy certification and the installation of photovoltaic systems. [Funding - Effect4buildings](#).

¹⁸⁶ [Funding - Effect4buildings](#)

¹⁸⁷ Source: Technical Assistance study on evaluating the EED (2020).

¹⁸⁸ [2-Experiences-and-procurement-of-technological-solutions-1.pdf \(effect4buildings.se\)](#)

¹⁸⁹ [Energy Performance Contracting - Effect4buildings](#)

a project of 5 years.¹⁹⁰ The country's Real Estate company (Riigi Kinnisvara, RKAS) which participated actively in Effect4Buildings has not been involved in more contracts.

Status of the business environment

The NECP indicates that there are 6 ESCOs active in Estonia. The central government is known to be familiar with the EnPC model. However, the model is largely unknown to other potential clients.

Contract modalities and alternatives

It is believed amongst sectoral stakeholders that the Central government, the MoF and are more interested in the use of Lighting as a Service (LaaS).

Financing

The projects implemented by Effect4Buildings were funded with client funds.

EU support

Experience with EU Support was only reported in relation to the project Effect4Buildings in public buildings (H2020).

Barriers

Most recently, the RRP has paid no explicit attention to EnPC common. The country's RRP focus includes household efficiency and smart grids, which could benefit from EnPC support. For instance, the Green Fund (€100m) to be created with RRF support for innovative technologies could be helpful for developing EnPC markets and pursue larger impact. Moreover, a review of the national operational plan shows a funding gap for energy renovation to meet the country's ambitious targets of renovating 22% of the building stock by 2030.¹⁹¹

Key barriers indicated about the energy renovation of buildings which may be of relevance for EnPC markets are administrative barriers and size of projects. The limited size of projects then finds limited motivation in municipalities to collaborate or initiate intracting processes, which could overcome these barriers, because decisions are mostly taken at central government level.¹⁹² According to responses to the EU Survey 2022, the Ministry of Finance and Kredex have greater interest for LaaS than EnPC. Limited familiarity of potential clients besides the central government and the availability of non-refundable grants and aid for investments in energy efficiency in municipalities are two market features reported by project Effect4buildings¹⁹³ which could be particularly adverse to the uptake of EnPC.

Drivers

Opportunities for EnPC development may be found in the government plans, set in the LTRS to developing information and awareness measures and to improve data availability and monitoring processes.¹⁹⁴ However, the attention paid to EnPC is unclear, e.g. in the RRP. It is also uncertain whether subsidies identified as funding opportunities by Effect4Buildings project (from State Shared Service Centre in 2018 and 2019 and the Kredex Foundation – starting in 2018 until exhaustion of funds)¹⁹⁵ have been made available for EnPC.

According to responses to the EU Survey 2022, a major driver for market development in Estonia is the financial and technical support, and the existence of well-informed politicians. Kredex and ministry of finance have interest in EnPC, and look closely at developments in the sector. Also, there is a potential for uptake of EnPC in multifamily buildings based on the existence of housing associations were developed through requirements of government and financial institutions (e.g. SvedBank). The implementation of the Effect4Buildings project from 2017 to 2020 with the support from the Interreg Baltic Sea Region Programme

¹⁹⁰ [2-EPC-Presentation-and-Training-material.pptx \(live.com\)](#)

¹⁹¹ Bankwatch Network. 2022. Briefing: Assessment of the Estonian operational programme. pp 8: ““Energy efficiency Estonia's target is to renovate 22 per cent of the total building stock by 2030, requiring a total investment of around EUR 5 billion. The National Audit Office has concluded that the building renovation rate needs to increase almost fivefold (from 100 to 466 apartment buildings a year) in order to reach the target for 2030 and that this target will not be met with the current policies”

¹⁹² Lars Holstenkamp Moritz Ehrtmann, Heinrich Degenhart, Tim-Oliver Kray Report on Future Investments in Participating Municipalities – Feasibility Study for Elva, Estonia [Microsoft Word - actnow_03-4_feasibility-study_elva\(final\) \(actnow-baltic.eu\)](#)

¹⁹³ [EFFECT4buildings-combined-guide_web_9-oct.pdf](#)

¹⁹⁴ [2022-03-02-op-assessment-ee-final.pdf \(euagenda.eu\)](#)

¹⁹⁵ [1-Funding-Possibilities-in-Denmark-Norway-Latvia-Estonia-Finland-and-Sweden.pdf \(effect4buildings.se\)](#)

(H2020) provided guidelines for EnPC in Estonia and other Baltic countries and promoted two pilots which resulted in the investment of €2m.¹⁹⁶

Perspective

Given the interest and capacity of Kredex, the experience of RKAS with EnPC, the availability of a toolbox developed by EFFEC4Buildings project, and national experience with LaaS there could be a potential for the development of EnPC. The existence of housing associations and facilitation capacity also contribute to a potential for housing and municipality projects.

Recommendations

There is a fundamental need of government commitment for EnPC to gain relevance in Estonia. More specific recommendations involve the provision of training for technical consultants, making available free audits and technical-administrative advice for apartment associations and private households.¹⁹⁷ There is also an apparent need of facilitation for municipalities to aggregate projects and to engage with deep renovation.¹⁹⁸ There is a precedent reported in the EU survey 2022 on the introduction of conditional requirements for the creation of housing associations for dwellers to receive energy subsidies. Following up on this precedent, building renovations relying on EnPC, could be a possible way ahead for renovating multi-family buildings. In general, conditional allocation of public support, alongside continued technical assistance, appear to be a possible way ahead for the introduction of contract modalities with saving guarantees.

¹⁹⁶ [Guide-Energy-Performance-Contracting_web.pdf \(effect4buildings.se\)](#); [Energy Performance Contracting - Effect4buildings, 1-Guideline-for-EPC-Customers-How-to-Start-an-EPC-Project.pdf \(effect4buildings.se\)](#); [2-EPC-Presentation-and-Training-material.pptx \(live.com\)](#)

¹⁹⁷ [2022-03-02-op-assessment-ee-final.pdf \(euagenda.eu\)](#)

¹⁹⁸ Lars Holstenkamp Moritz Ehrtmann, Heinrich Degenhart, Tim-Oliver Kray Report on Future Investments in Participating Municipalities – Feasibility Study for Elva, Estonia [Microsoft Word - actnow_03-4_feasibility-study_elva\(final\) \(actnow-baltic.eu\)](#)

9 Finland

Comparison previous status

The JRC report of 2021 indicated that the public sector market had been stable at around 4-5 projects signed biannually, with an approximate total value of €3.5, and 3 providers active in the market. EnPC receives limited attention in the NECP, only as a possible financing option for municipalities signatories of voluntary agreements and as a way to support energy renovation for vulnerable households. The LTRS is more explicit and indicate the availability of bonus subsidies for ESCO projects (25% over 20% conventional subsidy) planned for 2017-2025; the development of contracts; investment subsidy from Business Finland for renovations of non-residential buildings using EnPC; collaboration with providers to disseminate information on ESCO models. The LTRS also indicates a likely barrier to the development of EnPC: energy saving obligations on the public sector have been met in voluntary basis. Reflecting this situation the RRP does not mention ESCOs nor EnPC and focuses on early phase out of fossil oil heating in buildings (2024 in public buildings and 2030 in private buildings)

Current Status highlights

The EU Survey 2022 depicts a public market that has remained small in size but stable, and a private sector which has slowly taken off. EnPC with guaranteed savings is relatively common option in the public and private sector buildings (rated 2/3). In private sector buildings BOOT is preferred (3/3). In the industry, consultancy with technical guarantees are the prevailing option (2/3). Interventions tend to include maintenance, replacement of specific elements – largely ventilation and lighting, installation of building control systems, energy management and renewable generation (2/3 in both the public and private sector). Less common are DHC, which involve bundled projects in buildings both from the public and private sector, demand flexibility and storage capacity, and integral building renovations (1/3 in both the public and private sectors). Monitoring and verification and audits are part of all projects (3/3). There has been an increased demand for heat pumps and in the period 2022-23, it is expected that installation of renewables will gain relevance.

The tables below summarize the data gathered on market and contract sizes, and the trends for the period 2019-2021 and 2022-2024.

Table A 56. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	4	14		Data available for the private sector makes unclear differentiation between EnPC and other energy saving contracts
Overall size m€	2	8		
Typical* size m€	0.5	0.6		
Typical* duration	15	8		
Typical* payback (yrs)	10	5		
Typical* % of baseline	10	15		Rough estimates
Typical savings* MWh/year	550	1900		
Typical savings* m€/year	0.03	0.15		

Source: EU Survey 2022.

Table A 57. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable	Slow take-off	
Perspective 2022-2024	Slow take-off	Slow take-off	Driven by energy and CO2 prices in ETS

Source: EU Survey 2022

Status of the business environment

The sufficiency of and quality of services of provision and facilitation, as well as one stop shops, and active financing is reviewed in the EU Survey 2022 as satisfactory (2/3) or highly satisfactory (3/3) for both indicators. On the contrary, the understanding and willingness to engage with EnPC of public and private clients is relatively low (1/3 for both indicators). The financing sector is reported to be more willing and able to engage with EnPC (2/3 for both indicators).

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 58. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	24	2	2	
Facilitators	1	2	3	
One-stop-shops	1	2	3	
Financing actors willing to support EnPC	10	3	2	
Other				

Source: EU Survey 2022.

Table A 59. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	2	
Willingness	1	1	2	

Source: EU Survey 2022.

Contract modalities and alternatives

As shown in the table below, the main contracting modality for EnPC is guaranteed savings, in both the public and private sectors. Shared savings is also in use. There is a diversity of contract alternatives of relevance in Finland, either in the public or private sectors.

Table A 60. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	2	2		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	1		
Build-own-operate-transfer (BOOT)	2	3		
Contract energy management (chauffage)	0	2		
Facility management	0	2		
Consultancy and technical guarantee	2	2		
Energy efficiency improvement contracts	2	2		
PPPs			1	
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, most instruments receive a positive evaluation in the EU Survey 2022, especially definitions, availability of a list of operators, demonstration projects, the deployment of one-stop-shops and the use of audits. The use of Obligation schemes, and the use of EnPC to fulfil the exemplary role of public bodies' buildings are the regulatory options to which less attention has been paid. The government rules and practices of procurement, contracting and tendering are considered to be stringent for the public sector engagement with EnPC in its energy-saving efforts.

Table A 61. Experts' perception of the MS's implementation of the EU regulatory framework.

Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	3		
EnPC Guidelines	2		
EnPC Model contracts public sector (whether off- or on-balance sheet)	2		
EnPC Model contracts private sector	2		
Lists of EnPC qualified operators	3	Online	
One-stop-shops	3	The government company Motiva	
Other information instruments	2		
EnPC demonstration projects	3	There is a website for successful EnPC projects	
Obligation schemes /White Certificates	1		
Energy Audits	3	Tradition and expertise of auditing	
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1	Preference for regular contracting (due to expertise and stringent procurement legislation)	
Government rules and practices of procurement, contracting and tendering	1		It is stringent for EnPC

Source: EU Survey 2022.

Financing

There is a diversity of financing options (See table below). In general, financing conditions are favourable for energy saving projects. In public projects, client funds are most often involved (rated 3/3 in terms of frequency the EU Survey 2022), whilst in private sector provider funds are more important (rated 2/3). Public and private financing are available in a diversity of ways, which constitutes an opportunity for the market development. The former is more frequent (3/3) than the latter (2/3). Public financing through Business Finland and grants are highlighted (both rated 3/3). Guarantee funds are of relative relevance, especially in the public sector (2/3). No barriers have been identified about the combination of EU funds and EnPC.

Table A 62. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	3	1		
Provider funds	1	2		
Third-party Public funds	2	1		
Third party Private funds	1	2		
Private financing inst.	2	2		
Public financing inst.	3	3		Business Finland grants are available for EnPC
Debt financing	2	1		
Guarantees and guarantee funds	2	1		
Equity financing	0	0		
Mezzanine financing	1	1		
Project financing	1	1		
Leasing	2	2		
Special Purpose Vehicles	0	1		
Grants	3	2		
Forfeiting	0	0		
Other			1	

Source: EU Survey 2022.

Barriers

Based on the information collected in the EU Survey 2022, in the central government there is a continued preference for regular contracting due to expertise available and stringent procurement legislation. The established use of contract energy management constitutes a barrier to the development of EnPC in the real estate market and facility management has a similar effect on the industrial sector. In the period 2022-23 there is concern about the rising interest rates for financing EnPC projects. On the contrary, the EnPC model continues to be insufficiently known by potential clients. In previous years, the relevance granted by the government to EnPCs, e.g. in the NECP was limited. The development of the sector up to 2021 may have been limited due to the early progress in the achievement of obligations which, as reported in the LTRS, had been met based on Voluntary Energy Efficiency Agreements drawn up between the Government and industrial/municipal associations.¹⁹⁹ A focus on renewables in the RRP (over efficiency) may result in the development of other types of contracts.

Eurostat treatment of EnPC

Changes and clarifications on the **Eurostat treatment of EnPC** in government accounts have not been of impactful in the use of EnPC in Finland (rated 0 in a scale of -2,+2 in the EU Survey 2022). Off-balance contract models have been produced and are used in 30% of public projects, but are reported to need further adaptation to the context. No other budgeting rules are reported as problematic.

Drivers

The major drivers identified in the EU Survey 2022 for both the 2020-21 and 2022-23 periods are increasing energy prices. An increase in the ETS market for CO₂, along with pursuit of energy security may also drive the market in the upcoming period. Targets for the phase out of fossil fuel heating in buildings (public buildings in 2024, and private buildings in 2030) reported in the RRP may be also a key driver in the period 2022-23 and

¹⁹⁹ The NECP reported that municipalities and companies signing to voluntary agreements with the government have to commit to explore financing solutions including EnPC to overcome financing barriers to invest in energy efficiency. The continuation of these agreements during the reported period (2020-21) supported the use of EnPC along with other contracting options.

up to 2030. In addition to these drivers, the LTRS highlights the availability of incentives for ESCO projects (25% as opposed to the conventional subsidy) for the period 2017-25. ESCO projects in tertiary building renovations opt to Business Finland subsidies provided there are energy savings are guaranteed. Collaboration between the government and ESCOs was also planned in the LTRS.

EU support

The expert assessment of EU Support in the EU Survey 2022 indicates a generally positive appraisal of EU mechanisms, except for DEEP and EEFIG, whose impact is depicted as neutral. The RRF is appraised as the most positive mechanism and its impact is rated 2 in a scale from -2 to +2 for both clients and the financing sector. To increase the impact of most EU Support mechanisms, additional communication to make them better known at MS level are called for. The European Green Deal, Fit for 55 package is considered to be particularly positive for the engagement of the private and financial sector (Both rated as 2 in the -2, +2 scale).

Horizon support was received for NOVICE (New Buildings Energy Renovation Business Models incorporating dual energy services), which lasted from June 2017 to May 2020 and was tasked with developing an improved EnPC model for that improves the monetization of building renovation with the combined use of efficient, renewable and demand response technologies which aims at contract periods of 10 years, to be reduced to 7.5 years with the use of demand response.

Table A 63. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			1	0		
Guarantee Facility of the Smart Finance for Smart Buildings initiative			1	1		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			1	1		
InvestEU			1	1		
RRF			2	2		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			0	0		
European Green Deal, Fit for 55	1	2		2		

Source: EU Survey 2022.

Perspective

There are expectations for the public sector to take off, and the private sector to continue its ongoing take off, largely due to energy prices and new targets (EU Survey 2022). However, in a context of available financing and funding to which contributes the RRF, focused on renewables and new green technology investments, it is uncertain to what extent the EnPC will be engaged in a significant portion of new projects.

Recommendations

According to the EU Survey 2022, communication and promotion of EnPC and EU support mechanisms appears to be the missing element in previous actions. It is also advisable the continued use of incentives and special subsidies to EnPC projects. Adjustments to the stringent procurement rules could be also beneficial, e.g. with support of Motiva's experience in advising EnPC clients. Continuation of the NOVICE experience to improve the monetary benefits of EnPC. At EU level there is a potential for the collection of standardized information of EnPC projects of Finland, and for the exchange of experiences.

Good practices

Remarkable practices are the existence of incentives to EnPC and specific allocation of subsidies through Business Finland, as well as the existence of a government website where successful EnPC projects are published.

10 France

Comparison previous status

According to the JRC report of 2021, France was in the period 2018-2019 a static market (€70m contracted in the period), due to legal issues involving the use of savings to repay investment in EnPC, and appraisal of the model as complex, meaning that other energy services were preferred. The market was not expected to take off in the period 2020-2023. Also, the LTRS highlighted that the EnPC market had become stabilised and need further roll out. Support to EnPC was granted through a standardised technical sheet for multi-owner buildings (2018), and equity financing for local and regional authorities (€1b total in grants and subsidies, of which 0.5 is for EnPC and “Intracting”- which operates as an internal EnPC mechanism).²⁰⁰ The use of tax incentives has been highlighted as a good practice for its alignment with the Renovation Wave initiative.

Current Status highlights

The market sustained the impacts of the Covid pandemic with an increase in the market size and a stabilization of the number of projects.²⁰¹ The RRP did not mention energy services nor EnPC²⁰². It is unclear to what extent the funds allocated to building renovation (€5.83b) can be used by EnPC. However, intracting is receiving a budgetary allocation from the RRP, and this may be used to finance EnPC.²⁰³

The current market size has been reported to be in the ballpark of 60 to 110 contracts, amounting to €1.1b only in the public sector (contracts signed in 2020-21). This is well above the situation in 2019, and as claimed by participants in the EU Survey 2022, does not reflect the complete reality by missing a multitude of small projects. Contract durations in France typically last 8 or more than 10 years, and are of relatively large size (an average size of €10m was reported in the EU Survey 2022, well above the size reported in JRC 2021). Longer durations are associated to interventions in the envelope. There is a sizeable amount of contracts of shorter duration, mainly in retail and industry.²⁰⁴ Relatively low savings of 25-30% continue to call for regulatory intervention in making these contracts more ambitious, as reported in JRC 2021. This has been related by responding experts to the availability of grants and bonuses from EEOs. These support mechanisms pay less attention to small projects, which have a large potential in highly fragmented public and private sectors of France.

Annual studies from the Observatoire National des Contrats de Performance Énergétique are most useful to assess market status and needs. The last edition dates from November 2022. Councils, regions and departments are the main clients.²⁰⁵ As reported by experts in the EU Survey 2022, the main type of interventions takes place in publicly owned buildings (schools, public offices, sports facilities, military equipment) (frequency rated as 3/3), street lighting (2.5/3), and social housing (2/3). Project pools are of relative relevance (2/3), but mainly involve projects from a single public owner. The presence in the industry (1/3) is limited to utilities, and marginal in addressing processes. (A relative relevance of DHC reported in JRC 2021 does not seem to have resulted in developments of size comparable to those in buildings and public lighting.) Regarding the types of interventions in buildings, these mainly encompass maintenance (3/3), replacement of specific elements (Boilers, lighting, windows) (2/3). There is a diversity of opinions regarding the relevance of integral renovations, with some experts claiming its “very common among public buyers” (3/3). Renewables and energy management are also common elements of interventions (both 3/3). These have gained relevance since the previous JRC report (2021). Monitoring and verification is also part of projects (3/3). Audits tend to be part of separate contracts and are acknowledged as important for the eventual adoption of EnPC. A trend has been identified towards energy and carbon performance contracting. The tables below summarize the data gathered on market and contract sizes, and the trends for the period 2019-2021 and 2022-2024.

²⁰⁰ Intracting is referred in the LTRS as an “Innovative funding scheme that serves to create a virtuous circle of funding derived from energy savings to finance renovation works.”

²⁰¹ Chiffres clés de l’Observatoire National des CPE – Novembre 2022

²⁰² Search terms: “entreprises de services énergétiques”, “contrat de performance énergétique”, “marchés de services énergétiques”. PNRR Français.pdf (economie.gouv.fr); France’s National Recovery and Resilience Plan (europa.eu)

²⁰³ [DOC ONCPE 07 Etude-de-Cas Intracting-UCA.pdf \(observatoirecpe.fr\)](#)

²⁰⁴ [DOC ONCPE 05 Chiffres clés 3 nov2021.pdf \(observatoirecpe.fr\)](#)

²⁰⁵ [DOC ONCPE 07 Etude-de-Cas Intracting-UCA.pdf \(observatoirecpe.fr\)](#)

Table A 64. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	64-112	?		There is lack of statistical information on private markets
Overall size m€	1100	?		
Typical* size m€	10	10		
Typical* duration	8	8		Shorter contracts in retail and industry
Typical* payback (yrs)	8	8		
Typical* % of baseline	30	25		Savings are expected to increase beyond 40% in tertiary buildings due to the regulatory push ²⁰⁶
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey and Observatoire CPE.²⁰⁷

Table A 65. Market trends 2019-21 and 2022-24. EU Survey 2022 and Observatoire CPE. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Slow take-off	Slow take-off	The previously ongoing take-off was slowed during the COVID crisis
Perspective 2022-2024	Rapid take-off	Rapid take-off	

Source: EU Survey 2022

Status of the business environment

The same as for the size of the market, estimates on the number of providers and facilitators diverge between consulted experts in the EU Survey 2022. Whilst the number of providers seems to relatively suffice to supply the market (2/3), the number of facilitators is referred as insufficient (0/3). The limited availability of facilitation is a problem that had been reported by the JRC in 2021.

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 66. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	2-15	2	3	
Facilitators	0	0		Reported issue in JRC 2021
One-stop-shops				
Financing actors willing to support EnPC				
Other				

Source: EU Survey 2022.

²⁰⁶ Décret n° 2019-771 du 23 juillet 2019 relatif aux obligations d'actions de réduction de la consommation d'énergie finale dans des bâtiments à usage tertiaire

²⁰⁷ [DOC ONCPE 03 Chiffres clés 2 juin2019.pdf \(observatoirecpe.fr\)](#)

The public sector has the highest degree of willingness to engage with EnPC (2/3). Besides, the degree of understanding and willingness amongst public and private clients as well as the financial sector is low (1/3 for all three categories).

Table A 67. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	1	
Willingness	2	1	1	

Source: EU Survey 2022.

Contract modalities and alternatives

As shown in the table below, the main contracting modality for EnPC is guaranteed savings in the public sector, and shared savings in the private sector. Shared savings models are less frequent in the public sector due to legal limitations for the use of private financing. Besides, there is a diversity of contract alternatives of relevance in France, mainly Boot, Chauffage, facility management, and Consultancy with technical guarantee (building works contracts without guarantees of energy saving), which compete with EnPC for the energy efficiency market. In the private, sector there are contract modalities focused on the deployment of renewables and carbon neutrality.

Table A 68. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	2	0		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	3		There are regulatory limitations for private financing. ²⁰⁸ Expected to change with the next climate law
Build-own-operate-transfer (BOOT)	0.5	2		
Contract energy management (chauffage)	3	3		Direct competition with EnPC
Facility management	1	2		
Consultancy and technical guarantee	3	3		Building works with calculated energy improvement but without any guaranty of energy savings
Energy efficiency improvement contracts	1	0		Building works with calculated energy improvement but without any guaranty of energy savings
PPPs				
Other		2		Integration of renewables and focus on reducing carbon footprint

Source: EU Survey 2022.

Regulatory framework

Expert review of the French implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, shows that there have been deficiencies in the domain of model contracts in the public sector and most fundamentally in the absence of a list of qualified operators. Large operators however exist, posing a competitive barrier to the development of SMEs in the EnPC sector. During the reported period, there was room for inclusion of EnPC in rules and practices of procurement, contracting

²⁰⁸ [DOC ONCPE 05 Chiffres cles 3 nov2021.pdf \(observatoirecpe.fr\)](#)

and tendering. Addressing this could be an opportunity for further exploration of EnPC in fulfilment of Art. 5 of the EED. New models and guidance developed in 2022 may address these opportunities. Audits are the best valued instrument, followed by the use of EEOs to provide bonuses for commitments under EnPCs and demonstration projects – new efforts in the latter domain appear to have been deployed respect to the situation in 2018-20. No information was gathered in the EU Survey 2022 about the use of information instruments and the existence of one stop shops, potentially reflecting their insufficiency in the country, as reported in JRC 2021.

Table A 69. Experts’ perception of the MS’s implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2(1-3)		Some expert find the definition of EnPC lacking in French law
EnPC Guidelines	1(0-2)	a standardised technical sheet for EnPC was created in 2018	Multiple sources
EnPC Model contracts public sector (whether off- or on-balance sheet)	1.5	Models developed in 2022.	Off-balance contracts in progress ²⁰⁹
EnPC Model contracts private sector	2	Fedene developed a model in 2021 ²¹⁰	
Lists of EnPC qualified operators	0		
One-stop-shops		FAIRE network run by ADEME, ANAH and ANIL comprises 1000 experts	
Other information instruments			
EnPC demonstration projects	2		More transparency on the performance achieved
Obligation schemes /White Certificates	2	Bonus for savings under an EnPC	Lack of requirement for savings to be measured
Energy Audits	3		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1.5		Need greater focus on achievements than on type of works ²¹¹
Government rules and practices of procurement, contracting and tendering	1.5		
Impact of EnPC in public sector performance	3		
Impact of EnPC of public sector on private sector adoption of EnPC	2		

Source: EU Survey 2022.

Financing

Changes and clarifications on the statistical treatment of EnPC in public accounts have not influenced the dynamics in the public sector, especially since public buyers are traditionally reluctant to use private financing in large public projects.²¹² There is also a reported difficulty to finance small EnPCs.

Table A 70. Financing sources for EnPC projects. Experts’ responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some

²⁰⁹ A toolkit including new model contracts and guidance for public contracts has been developed and published during 2022 “Mettre en place un Contrat de Performance Énergétique – Le clausier CPE” [Base de ressources – ACTEE \(programme-cee-actee.fr\)](#).

²¹⁰ [\[#PUBLICATION\] Le SNEC publie un modèle de contrat de performance énergétique – Fedene](#)

²¹¹ France addresses Art. 5 of the EED through alternative mechanisms.

²¹² The public entity can use private financing in the MPPE (Marché de Partenariat de Performance Énergétique) framework, as opposed to the MPPG (Marché public de Performance Énergétique). However, there is reluctance to use private financing due to its financial costs. Hence, the interest in intracting. A proposal of law is expected to review the interest of third-party financing for EnPC in public sector.

explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	3	2		
Provider funds	0	2		
Third-party Public funds	1.5	0		
Third party Private funds	0	1		Difficult in public sector. New offers available for the private sector
Private financing inst.				
Public financing inst.				
Debt financing	3			
Guarantees and guarantee funds				
Equity financing				
Mezzanine financing				
Project financing				
Leasing				
Special Purpose Vehicles				
Grants	3			
Forfeiting				
Other			1	

Source: EU Survey 2022.

Barriers

The French legislation make it difficult the use of third-party financing for EnPCs in public property. The latter is furthermore fragmented, with multiple public buyers lacking scale (also reported in the LTRS as a barrier for renovation of public tertiary buildings). In the residential sector, financial support is costly, and split incentives weight down initiatives. Moreover, in the period 2022-23, there is a concern about the removal of the bonus brought about by White certificates to interventions in the industry.

As also reported in the JRC report of 2021, contracts for building works with technical guarantee (often without guarantee of performance) and energy management (chauffage or heating contracts with profit sharing –“Contrats d’exploitation-maintenance avec clause d’intéressement”) compete with EnPC and are preferred over the latter on the grounds of their lower complexity even though they are less ambitious in terms of saving energy.

Eurostat treatment of EnPC

Off-balance contracts in the public sector have not yet been developed. The development and adoption of off-balance contracts depends upon regulatory developments on the use of private financing in EnPCs in the public sector.

Drivers

France implements the Art. 7 of the EED fully through EEOs. The major drivers indicated in the EU Survey 2022 are White certificates and the public procurement law, which allows for integral contracts (CREMs - Design-Implementation-Operation and Maintenance – or MGP – Marché Global de Performance since 2016). As for the period 2022-23, there are expectations on the removal of barriers for third-party financing in 2023. The rise of energy prices is also a driver, especially in the public sector. The “Tertiary decree” is pushing

for higher renovation targets in tertiary buildings, for these to achieve 40% savings compared to 2010 by 2030.²¹³

EU support

Limited expert insight was obtained in this domain. In the EU Survey 2022, it was recommended that public funds are allocated to measurable and achieved savings to ensure an effective use. Expert assessment only referred to the effects of the Green Deal, Fit for 55 and NextGenerationEU packages, which are considered most relevant for the financing actors (rated 2 in a scale from -2 to +2) and public sector (rated 1).

There are several H2020 projects active, and recent experiences in France that address some of the barriers reported:

- The Project BAPAURA (Building energy retrofitting Assistance by Public authorities in AUvergne-Rhône- Alpes) coordinated by ADEME is working on developing models for renovating public buildings in small and medium-sized municipalities, whose limited capacities hinder their use of advancing contracting schemes and fragmented grants. The project addresses the use of WhCs, grants and the potential of one stop shops.
- The project NEON (Next-Generation Integrated Energy Services fOr Citizen Energy CommuNities) pursues the integration of EnPC and P4P schemes to support efforts of energy communities.
- GuarantEE (Energy Efficiency with Performance Guarantees in Private and Public Sector) (2016-2019) worked on the renovation of public buildings with a focus on contracts that address split incentives and are more flexible, and providing guidance and examples to municipal clients.

Perspective

Expectations for speeding up of the markets take off, for both the public and private sectors, are associated to the rise in energy prices, especially in public procurement processes, as well as an expected regulatory push (targets) and enablers of ESCO financing in the climate law. The type of projects is expected to increasingly involve integral renovation and carbon neutrality targets.

Recommendations

Expert recommendations include calls for engaging small public bodies and small private projects in collaboration with SME operators and private financing. There is also a potential for building up on positive experiences (use of WhCs) of a bonus for EnPC in state aids, which should prioritise real and measured energy savings. For this, increased transparency of EnPC achievements through M&V needs to be pursued. These developments should take place alongside ongoing development of Eurostat compliant off-balance contracts for the public sector.

Based on the analysis of the French case, the development of technical capacities through facilitation and one stop shops would be key for small public bodies and SMEs to access technical expertise and to aggregate projects. Technical assistance and exchange of experiences coordinated with DEEP and EEFIG could help develop these capacities. Continued promotion of certified services could help overcome limited transparency of savings and hence enable eligibility of EnPC for bonus systems.

Good practice

- The EnPC Observatory (Observatoire CPE) monitors the market. Even though not all contracts are reported, the Observatory's reports are an invaluable tool to understand the French market.
- There are positive experiences with the use of intracting – which is receiving a budgetary allocation from the RPP – for financing EnPC.²¹⁴

There is a trend towards Energy and performance contracts, in alignment with the Carbon Neutrality Strategy of France for 2050 and EU strategic approach.²¹⁵ It has been estimated that 44% of of EnPCs include greenhouse gas emission reduction commitments.²¹⁶

²¹³ Décret n° 2019-771 du 23 juillet 2019 relatif aux obligations d'actions de réduction de la consommation d'énergie finale dans des bâtiments à usage tertiaire.

²¹⁴ [DOC ONCPE_07_Etude-de-Cas_Intracting-UCA.pdf \(observatoirecpe.fr\)](#)

²¹⁵ [Observatoire National des Contrats de Performance Energétique Chiffres clés – Novembre 2022](#)

²¹⁶ Plainemaison 2022, citing FEDENE

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Comparison previous status

In the previous JRC report on EnPC in public markets (2021) the German market was depicted as mature. The German market was previously characterized by being in the group of those with contracts longer than 10 years. This was considered to be a result from attention being paid to the depth, quality and comprehensiveness of renovations. The market, however, was stagnant, largely due to investment having turned towards other contracting models. The situation was expected to reverse during the currently reported period (JRC 2021).

Current Status highlights

Recent progress in the political agenda have brought to the fore new challenges associated to the pursuit of decarbonisation targets and energy independence, in a context of delayed modernisation of buildings and where local action continues to be a challenge.²¹⁷ In addition to climate and energy targets, there is a need of addressing user comfort and health issues (Rombach 2022).²¹⁸ EnPC as well as a diversity of contracting options receives attention in the German NECP and LTRS. These documents highlight technical support for municipalities, consultation and dialogue between administrations (Bund-Länder Dialog Contracting), demonstration projects, facilitation for local governments and reducing bureaucracy associated to public support to investing in buildings' energy efficiency (including subsidies, grants and newly introduced tax incentives). The mentoring program to foster energy services, with a focus on EnPC in the energy agencies of federal states has been active in providing expertise to local authorities. A good practice highlighted in the EC review of the German LTRS was the use of tax incentives to foster building renovation in the private sector.²¹⁹ Although the RRP did not mention EnPC nor ESCO, it strengthens funding for energy efficiency renovations (€2.5b), addresses barriers to investment in the public administration, carbon pricing and increases efforts to deploy RES. The participants in the EU Survey 2022 characterized the market for the period of 2020-21 as having remained stable compared to the previous situation. The reported size of the market is stable around €670m per year (BfEE 2021).²²⁰

Based on the EU Survey 2022, the most common intervention sites are public buildings (2.3/3) and with a focus on schools and other service infrastructure. Public lighting is also a relevant sector (1.8/3). In buildings, there is increased focus on savings in public buildings, the efficiency of gas-powered heating systems (largely in SMEs and public buildings). Most interventions involve replacement of specific elements in the public sector (2.5) and the private sector (2/3). Maintenance and building control systems and renewable generation are also common, especially in the public sector (2.5/, 2/3, and 1.8/3, respectively), following previously reported trends. Project bundling is common (2/3) and interventions in the industry are of certain relevance, compared to other markets (1.3/3). Limited relevance of DHC has been reported, largely due to the use of other ESCO models in this type of projects. There is a trend towards more user centric renovations, such as full renovations in schools, e.g. to include accessibility measures and fire counter measures, as well interior renovation. This trend calls for attention towards measures which are often paid upfront by the customer, or public funding, and not from energy savings.

The tables below summarize the data gathered on market size, contract sizes, and market trends.

²¹⁷ In the public sector, only 14% of buildings meet climate targets, and 50% need to be modernised urgently (Lohse 2022; Rombach 2022).

²¹⁸ Rombach, Lorenz 2022. The German mentoring program to foster energy services in the public sector – Methodology, experiences and best practices. Berliner Energieagentur GmbH Frankfurt am Main, 05.10.2022

²¹⁹ EC's [Staff Working Document](#) of March 2021

²²⁰ The current market report presentation for the energy service market in Germany shows a total potential for energy services of at least 40 bn € from which 8-10 bn € are currently been exploited BfEE 2022 – Empirische Untersuchung des Marktes für Energiedienstleistungen, Energieaudits und andere Energieeffizienzmaßnahmen im Jahr 2021 (PDF, 10MB, Datei ist nicht barrierefrei)https://www.bfee-online.de/SharedDocs/Downloads/BfEE/DE/Energiedienstleistungen/edl22_endbericht_2021.pdf?__blob=publicationFile&v=2.

Table A 71. Market size and EnPC contract characteristics. Source: EU Survey 2022 and BfEE 2020. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	200	300	500	Market estimates are highly variable (data on “contracting”)
Overall size m€	400	240	640	
Typical size m€	1.5-2.5	<1	0.4-1.8	
Typical duration	12-15	5-10	10	
Typical payback (yrs)	12, >15	2-8		Public contracts involving envelope renovation require upfront payments
Typical % of baseline	28-65		50-60	
Typical savings MWh/year			2.5	
Typical savings m€/year	0.1-0.7			

Source: EU Survey 2022.

The trend estimates are highly variable. The values adopted to assess the value of the market is significantly higher than in the previous period. However, most expert estimates for the trends 2019-21 speak of a stable situation.

Table A 72. Market trends 2019-21 and 2022-24. Experts’ response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable / Rapid take off in some states	Stable	
Perspective 2022-2024	Upward	Rapid take off	

Source: EU Survey 2022.

Status of the business environment

Contrary to the previously reported situation for the public sector (JRC 2021), the state of provision and, especially of facilitation, does not seem to fulfil the market needs. Aligning with the previous situation, the quality of provision is highly appreciated (2.6/3) and there is still room for improvement in the quality of facilitation. The same can be argued for the level of understanding and willingness to engage with EnPC in the public, private and financial sectors.

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 73. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	45	1.6	2.6	
Facilitators	>100	1.1	1.5	
One Stop Shops	2	1.5	1.7	
Financing actors willing to support EnPC	12	1.3	2	10-15 actors able to refinance ESCOs
Other				

Source: EU Survey 2022.

Table A 74. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1.9	1.5	1.6	Increasing
Willingness	1.6	1.3	1.5	

Source: EU Survey 2022.

Contract modalities and alternatives

The main contracting modality of EnPC in the public sector is guaranteed savings (See table below). To an extent, shared savings is also implemented in both the public and private sector. There is also a modality of EnPC which combines guaranteed and shared savings modalities (parties share only those savings that exceed what was initially agreed, and the contractor keeps 30% of the financial risk). The EnPC model competes with less complex models, such as BOOT which are not necessarily saving energy, and in general models that do not require the involvement of an ESCO. (Such a problematic competition with less complex models was also reported also in JRC 2021.) In response to this there is a tendency to simplify EnPC contracts.

Table A 75. Relevance of different contract models in the public and private sectors of the MS.

Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1.7	1		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	1		
Build-own-operate-transfer (BOOT)	1.5	1.3		Often preferred over EnPC for its simplicity, even though no energy savings are deemed
Contract energy management (chauffage)	2	1.7		
Facility management	2	2.7		
Consultancy and technical guarantee	1	1		
Energy efficiency improvement contracts	1.3	1.3		
PPPs	1	1.3		
Other*	2	2		Energy Management contracts which compared to EnPC they involve a small investment and less intense M&V. The remuneration is related to savings too.

Source: EU Survey 2022

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, the most favourably reviewed instruments are demonstration projects, information, the development of model contracts and the use of audits (average assessment at or above 2/3). To an extent it appears that more demonstration is taking place than in the previous period (2018-2020), but EnPC may have lost relevance in the exemplary role of the public sector.

Table A 76. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	1.7		
EnPC Guidelines	2		
EnPC Model contracts public sector (whether off- or on-balance sheet)	2.3		
EnPC Model contracts private sector	1.5		
Lists of EnPC qualified operators	1.7		
One-stop-shops	2		
Other information instruments	2		
EnPC demonstration projects	2.3	Cases have been promoted in states. ²²¹	
Obligation schemes /White Certificates	1.7		Federal agencies only
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1	Still not mandatory for public bodies	
Government rules and practices of procurement, contracting and tendering	1		

Source: EU Survey 2022.

Financing

Financing is available from a variety of sources and in diverse modalities. Provider funds prevail (rated frequency of 3/3 for public and private projects). Client funds are also a key element, especially in private projects (1.5/3 in public projects and 2/3 in private projects). In public projects grants and public financing are used to finance investments with long recovery or not involving energy savings. Private financing is common for private bodies (2/3 in both cases). Equity financing, grants and forfeiting are common elements of EnPC financing (all three rated 2/3). Forfeiting continues to be a key option in the public sector, where it supports close to 50 projects per year. Loan financing is also gaining relevance to support short return investments.

Financing barriers about the combination of funding options have not been highlighted. However, there are claims that current grant system is not able to face the degree of efficiency and decarbonisation pursued in national targets. The availability of low interest rates for public bodies continues to be disadvantageous for ESCOs. The combination of capital borrowed by the public body and provider funds has gained relevance in a context where deep, complex renovations are increasingly demanded due, amongst other, to regulatory pressure.

Table A 77. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 =uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1.5	2	1.7	
Provider funds	3	3	2	
Third-party Public funds	0.5	1	1.3	
Third party Private funds	0.5	1	0.7	
Private financing	1	2	2	

²²¹ In Baden-Württemberg only there is a list of more than 50 examples.

inst.				
Public financing inst.	2	1	1	
Debt financing	1	1	1	
Guarantees and guarantee funds	1	1		
Equity financing	2	2		
Mezzanine financing				
Project financing	1	1	2	
Leasing	1	1		
Special Purpose Vehicles	1	1		
Grants	2	2		Grants are used to cover investments that are not quickly repaid from savings
Forfeiting	2.5	2		
Other			1	

Source: EU Survey 2022.

Barriers

Previously reported barriers of low energy prices and uncertainty about the implementation of carbon taxation (JRC 2021) appear to have been overcome. The Covid involved a significant halt on public markets. Remaining barriers reported in the EU Survey 2022 are the existence of complex and bureaucratic processes, discriminative regulations for ESCO (access to subsidies for analysis of potential, legal framework) which furthermore are diverse in the national states. Long-term EnPC projects also come into conflict with the financing of the municipalities (so-called budget protection of financially weak municipalities). The complexity of the model is also problematic for clients, especially in the public sector, where expertise to deal with these contracts is often not available, resulting in complex tenders, and additional costs to the providers. Tender guidelines are often complex and need standardization.²²² Previous experience with less transparent PPP models have been negative, leading to preference for simpler options such as consulting and energy procurement options. However, there is a slow evolution of the legislative framework to overcome limitations in the treatment of ESCOs. The availability of private financing for energy efficiency investments is limited.²²³ Finally, long-term EnPC projects continue to conflict with the financing of municipalities (known as budget protection mechanism for financially weak municipalities), except those where savings and spendings are equal (pay-as-you-save). In the private sector, the WärmeLV law for commercial heating supply is problematic for investment to address efficiency systems. More recently, there has been a limited number of applications to the BMWK funds that support EnPC, and the expansion of renewables which dominates the public discussion seems to be limiting interest on EnPC.

Eurostat treatment of EnPC

Off-balance contracts are available for the public sector. Respondents to the EU Survey 2022 consider that the Eurostat and EIB publications on the matter have increased the attention to debt and EnPC. Off-balance contracting has also relative relevance in states, for instance in the region of Baden Württemberg some 40% of contracts take place using this model. These are of less relevance for municipalities, e.g. Berlin does not have an off-balance model contract. The treatment of EnPC in the states continues to be problematic because modalities with investment made by the contractor are treated as debt and are deducted from the cities' debit limit, hence requiring planning and negotiation to take place before the actual costs of the project are determined, in collaboration with the ESCO.

²²² Emphasis has been put in the literature on the highly complex administration and a lack of tailored contract models (Lohse 2022; Rombach 2022), regardless that updated model contracts are available free of charge from the German Energy Agency (DENA) (<https://www.kompetenzzentrum-contracting.de/umsetzungshilfen/dena-publikationen/>)

²²³ Rüdiger Lohse. EDL_HUB. User Centric Energy Service Models, Challenges and Best Practices. Frankfurt EU ESCO Conference | 5. October 2022.

Drivers

Development of the legal framework of the Energiewende (Building Energy Act – GEG-, Federal Promotion of Efficient Buildings- BEG-, Kommunalrichtlinie Municipal guideline - KLR- funding program for municipalities) which is slowly being adopted as needed for EnPC market needs. The introduction of new energy efficiency obligations for the public and energy efficiency requirements for the private sector have created new pressure on the market, reversing the situation observed in JRC 2021. Major drivers for the period 2022-23, identified in the EU Survey 2022 are the technical support program of DENA's Energy Solutions Initiative (BMWK) which intends to support 100 EnPC projects in municipalities, energy prices, and the increased national and European targets, along with its renewed focus on decarbonisation, a carbon tax, and subsidies improved both in quantity and structure of allocation. In 2023, the New Energy Efficiency Act (2023) and new EnPC contracts for the public sector are expected. As of 2024 a new obligation of using 65% renewable energy for new heating systems will be in place.

EU support

Feedback on EU Support instruments in the EU Survey 2022 was scattered, with few participants responding to these questions, and few cases where responses can be compared for a single question. Limited familiarity of experts with EU support has been attributed by reviewers to greater familiarity with national support mechanisms, and the need of coordination at Federal and State level.

The most appreciated instrument is technical assistance, especially for the public sector (rated 2 in the scale of -2 to +2 for the public sector and as 1 for its impact on the private sector). Key projects taking place in Germany have been the QualitEE project (2017-20) on the standardization and development of procurement and financing mechanisms; Guarantee (2016-20) on the renovation of public buildings, NOVICE (2017-20), on the development of new contracting models

The Green Deal, Fit for 55 and NextGenerationEU package receives a similar degree of appreciation. (Reflections of the EGD and related processes and instruments are ambiguous and often contradictory about the certainty generated and expected effects.) The RRF and the DEEP and EEFIG tools were rated as having nil effect.²²⁴

Table A 78. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2O2O)	2		1	1	Not sufficiently known	*
Guarantee Facility of the Smart Finance for Smart Buildings initiative			1			
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			1			
InvestEU			1			
RRF			0			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			0			
European Green Deal, Fit for 55	1.8	1.3	1			

Source: EU Survey 2022. *Implementation of InEECo 2015-2018 with 50 m€ investment in Baden-Württemberg.

²²⁴ This situation contrasts with German projects having a strong presence in the DEEP database, and their cost-savings being available for different types of fuels, potentially indicating a need for further promotion of the tool as way to understand the potential of projects.

Perspective

To an extent, the trend forecasted in JRC 2021 towards more guarantees and shorter modalities seems to be materializing in the inclusion of investments paid by the client (and as recommended by some EU Survey 2022 respondents, to be separated in contractual options from energy-saving interventions). This option does not necessarily imply lower depth of intervention but the separation of EnPC as one element of the overall project. Increased demand for EnPC is expected, especially in the public sector. The role of energy efficiency is expected to increase with regulations on building energy efficiency standards, developments in decarbonization and renewable generation. Public sector, housing companies and SMEs are increasing their demand from EnPC.²²⁵ Client demands are tending towards for longer partnerships (i.e. not necessarily longer contracts), simplification of coordination processes, e.g. through reliance on facilitation and One-Stop-Shops, and simplification of solutions in a context of highly regulated building and industry sectors (Lohse 2022).²²⁶ At the end of 2022, Germany moved forth an energy efficiency act which is expected to provide a “level playing” legal framework and subsidy access. That will open new opportunities for EnPC in the housing and industry sector.

Recommendations

The recommendations for national policy-makers identified in the EU Survey 2022 and the literature include:

- Inclusion of contractor costs (e.g. preparation of feasibility studies) as eligible for subsidies;
- Further simplification of models through adaptation to the needs of clients, and particularly of local governments, e.g. subdivision of contracts according to investment areas depending on duration of paybacks/ strategic standards regarding achievement of climate and energy targets;²²⁷
- Standardization of tender guidelines which can be overly complex due to lack of expertise, and are diverse across states, and furthering of the two-step tendering model;
- Incentives for EnPC projects on buildings' envelope, based on achievements and guarantees aligned with climate targets, are needed for an energy efficiency first approach to be implemented along with the electrification of heating systems (in response to German Building Act requiring 65% renewable energy in heating from 2024), and in combination with energy supply contracts;
- Increased evaluation efforts in the domains of market potential, and the effects of audits and consultancy program;
- Implementation of obligations on energy providers;
- Mandatory checks on the applicability of EnPC in the public sector;
- Expansion of mentoring and dialoguing mechanisms between sectoral actors.²²⁸

Regarding EU support, the consulted experts expressed a demand for coordination efforts to be more closely connected with national and state-level decision-making. This would serve to better address client needs (e.g. for deep renovation and addressing building use), and to promote the model and support mechanisms. EU strategic guidance should foster the definition of strategies, standards and financing models that focus on the achievement of climate neutrality targets, well beyond the current achievements of EnPC projects. To contribute to the achievement of these targets, EU funding could address long term investments whose pay-back is mostly not expected within the duration of contracts

Good practice

The following practices have been highlighted in the literature reviewed (Rombach 2022, Lohse 2022) and in expert input to the EU Survey 2022:

- Local administrations adoption of two-step tender invitation;
- Existence of requisites to consider EnPC and justify not opting for it in state policies;
- Freely available model contracts at the site of the German Energy Agency;
- Mentoring and dialogue to foster capacities in local administrations;

²²⁵ There are expectations for ESCOs to provide consulting services in the decarbonization of heating grids (Micro and District Heating), which is being backed up by a €3b subsidy program of the Federal Government. These processes may serve to rethink the ESCO and EnPC models.

²²⁶ Rüdiger Lohse. EDL_HUB. User Centric Energy Service Models, Challenges and Best Practices. Frankfurt EU ESCO Conference | 5. October 2022.

²²⁷ Ringel (2021) also reviews the transaction costs associated with this contractual and bureaucratic complexity.

²²⁸ Also found by Ringel (2021).

- Collaboration processes, e.g. workshops, for adapting projects and contracts to client needs (Figure).

12 Greece

Comparison previous status

In 2021, the JRC reported the existence 12 providers of EnPC and 8 contracts having taken place in 2018-2019 with a total volume around €100m for the public sector, showing market growth compared to the 3 providers and 2-3 contracts reported in JRC 2019, also for the public sector. There was however uncertainty about the extent these public contracts could be considered EnPC or were best relatable to the PPP model, due to the nature of the guarantees provided. At that time, there were expectations for the market to develop from pilots in public lighting and to incorporate projects in the domains of lighting, HVAC, rooftop insulation, renewables, and maintenance. The report also echoed expert recommendations for information measures to publicize successful cases, as well as the development of model contracts and of institutional capacities to monitor EnPC as key efforts needed to kick start a market which had been only active in the public sector but vaguely relating to EnPC. Competing contractual modalities reported in JRC 2021 for the public sector in the period 2018-19 were facility management, consultancy & technical guarantee, and efficiency improvement contracts. Moreover, a combination of PPPs and structural funds was reported to compete with genuine EnPC. It was uncertain whether this model could lead to the development of EnPC markets or constitute a major barrier for this to happen.

Current Status highlights

Policy developments as reported by national authorities could have led to a development of EnPC during the reported period (2020-21). In particular the NECP and LTRS mentioned plans for financing EnPC renovation of public buildings through the ELEKTRA program. The program, eventually announced at the end of 2022, has a budget of €640m to encourage the development of an energy services market for the energy renovation of public buildings and infrastructure. Additionally, the NECP and LTRS reported promotion of PPP (including EnPC) and hybrid financing models with risk sharing and insurance mechanisms for building renovation – currently ongoing – as well as the development of financing mechanisms for EnPC in the industrial sector. The planned establishment of an Energy Efficiency Fund and government interest for renewables may have been supportive for EnPCs too. The materials related to the RRP in English do not refer to ESCO nor EnPC. However, planned improvement of contract enforcement mechanisms included in the RRP (EC Analysis)²²⁹ may be of relevance for the upcoming development of EnPC, especially since, as recognized in the NECP, financing through EnPC is problematic. The project Prodesa (Horizon 2020) developed bundled projects on public buildings in seven municipalities of the Attica region combining efficiency and renewable interventions (40% savings due to efficiency, and 50% savings on remaining load through PV).²³⁰

The tables below summarize the data gathered on market size, contract sizes, and market trends.

²²⁹ [EUR-Lex - 52021SC0155 - EN - EUR-Lex \(europa.eu\)](#)

²³⁰ [Short Description - Prodesa | Energy efficiency project development for South Attica](#)

Table A 79. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	27 (2 for buildings and 25 for street lighting)	13	40	Prodesa bundled public projects of buildings (96) buildings, and public lighting
Overall size m€	21 (13m in buildings, 8m street lighting)	8.5	29.5	
Typical* size m€	2.3-5.2	0.6		
Typical* duration	10			
Typical* payback (yrs)	8.6 (6-25)			
Typical* % of baseline	65-70			65% in buildings (efficiency and renewables), 70% in public lighting
Typical savings* MWh/year	1000 in building bundles, 13000 in street lighting (per municipality) in PES			
Typical savings* m€/year				

Source: Prodesa 2020²³¹ and EU Survey 2022.

Table A 80. Market trends 2019-21 and 2022-24.

	Public sector	Private sector	Comments
Trend 2019-2021	Slow take off	Preliminary	
Perspective 2022-2024	Slow take off	Slow take off	Elektra program

Source: Prodesa 2020 and QualiteEE 2018; Ambience 2020.²³²

Status of the business environment

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 81. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers				
Facilitators	1	2	3	CRES
One-stop-shops				
Financing actors willing to support EnPC	0	1	0	Lack of technical knowledge for the evaluation of EnPC projects
Other				

Source: EU Survey 2022.

²³¹ [d7-9-2-summary-of-final-publishable-report_en-2.pdf; d7-9-2-summary-of-final-publishable-report_en-2.pdf](#)

²³² [d7-9-2-summary-of-final-publishable-report_en-2.pdf; QualiteEE 2-04 CountryReport EL 2018.pdf](#)

Table A 82. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	0	
Willingness	1	2	0	Municipalities are reluctant to EnPC

Source: Prodesa 2020.²³³

Contract modalities and alternatives

The expert responses to the EU Survey and reviewed literature (e.g. IEA, nd)²³⁴ indicate that the shared savings modality and a combination of shared and guaranteed savings have been traditionally preferred. However, the projects identified in the study period as furthered by Project Prodesa in the public sector operate with guaranteed savings. Most common collaboration of the public sector with service providers is PPPs to build public buildings where private partners take ownership and responsibility for energy costs for 30 years through energy management contracts.

Table A 83. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1	2		The projects identified in the public sector operate with Guaranteed savings, with most investment being provided through the ESCO, and public grant support; in the private sector 9 guaranteed contracts were identified
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	1		In the private sector, 4 projects were identified
Build-own-operate-transfer (BOOT)				
Contract energy management (chauffage)				
Facility management				
Consultancy and technical guarantee				
Energy efficiency improvement contracts				
PPPs	2			
Other				

Source: EU Survey 2022; Prodesa 2020, QualitEE 2018; IEA, nd.²³⁵

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets shows that best rated instruments are definitions and audits (2/3) and that most other policy implementation domains have limited impact.

²³³ [d7-9-2-summary-of-final-publishable-report_en-2.pdf](#)

²³⁴ [ESCO contracts – Energy Service Companies \(ESCOs\) – Analysis - IEA](#)

²³⁵ [d7-9-2-summary-of-final-publishable-report_en-2.pdf](#); [QualitEE 2-04 CountryReport_EL_2018.pdf](#); [ESCO contracts – Energy Service Companies \(ESCOs\) – Analysis - IEA](#)

Table A 84. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2		
EnPC Guidelines	1		
EnPC Model contracts public sector (whether off- or on-balance sheet)	1		
EnPC Model contracts private sector	1		
Lists of EnPC qualified operators	1	In 2015 there were 10 signatories of the European code of conduct	No national esco association, No official list found
One-stop-shops			
Other information instruments	1		
EnPC demonstration projects	1		
Obligation schemes /White Certificates	2		
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1		
Government rules and practices of procurement, contracting and tendering	1		
Impact of EnPC in public sector performance	1		
Impact of EnPC of public sector on private sector adoption of EnPC	1		

Source: EU Survey 2022.

Financing

Table A 85. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	0	1		
Provider funds	0	2		
Third-party Public funds	0	0		
Third party Private funds	2	1	2	
Private financing inst.	0	1		
Public financing inst.	1	0		
Debt financing		0		
Guarantees and guarantee funds	0	1		
Equity financing	0	1		
Mezzanine financing	0	0		
Project financing	0	1		
Leasing	0	1		
Special Purpose Vehicles	0	0		
Grants	1	1	2	
Forfaiting	0	1		
Other				

Source: EU Survey 2022.

Barriers

A difficulty to finance through EnPC was claimed in the NECP. National experts also highlighted as barriers to the engagement of private financing, which is considered the greatest problem for EnPC development:

- Lack of technical knowledge for the evaluation of EnPC projects
- Lack of confidence regarding the quality of ESCOs services
- The complexity of EnPC

Moreover, the key barriers identified and addressed by project Prodesa were:²³⁶

- Lack of financing for Project Development
- Non-developed ESCO market and lack of examples
- Reluctance of municipalities towards new contract modalities and tendering procedures.

Eurostat treatment of EnPC

Not reported by experts nor country reports found. Project Transparence, reported some preparedness to work off-balance in 2015 and that about one quarter of respondents reported having used off-balance sheet financing through models such as project financing and leasing applied to EnPC.²³⁷

Drivers

The major drivers identified have been presented as a part of **Current Status highlights**. Expectations on the implementation of ELEKTRA (RRF supported), the development of financing mechanisms for building renovation, and the integration of renewables in building renovation. Also, it appears that joint development of public lighting projects and municipality building renovations is resulting in adoption where promoted. New funds from InvestEU may have an effect on EnPC, but seems to have a greater focus on generation and distribution.

EU support

The input received to the EU Survey 2022 indicates limited recognition towards the benefits of EU support on the Greek EnPC market besides the positive impact of technical assistance and ESIF on the private sector, and of the EGD, Fit for 55 and Next Generation EU package on the public sector. Greece has received extensive support through H2020 projects, including QualitEE on the development of standardization, and procurement capacities (2017-20), Trust-EPC promoting models in tertiary buildings (2015-18), Prodesa focused on bundling EnPCs in the South-Attica region of Greece, and with support from the financing a National Revolving Fund for Energy Efficiency (2017-20), Refine on the development of refinancing capability in the energy services sector (2020-23), and NOVICE on developing contractual models (2017-20).

²³⁶ [PowerPoint Presentation \(europa.eu\)](#)

²³⁷ [Transparence.eu :: Database :: Off-balance sheet finance](#)

Table A 86. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	0	2	2	0		Vari, Voula, Vouliagmeni supported by PDA H2020); Newly signed ELENA for government capacity
Guarantee Facility of the Smart Finance for Smart Buildings initiative	1	2	2	0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	1	2	2	0		
InvestEU	1	2	2			Large expectations
RRF	2	0	2	0		Elektra
De-Risking Efficiency Platform (DEEP) and EFIG Underwriting Toolkit						
European Green Deal, Fit for 55	1	0		0		

Source: EU Survey 2022.

Perspective

A potential development of EnPC specialized in EnPC has been described in the academic literature.²³⁸ There are examples of large EnPC projects specifically focused on the establishment of photovoltaic capacity.²³⁹ There are large expectations on Elektra project, as well as on InvestEU, with investment expected to start in 2023 (€50b, including renewables, production and distribution networks).

Recommendations

The Prodesa project has showed the potential for EnPC with public funding support, technical assistance, bundling efforts and combination of Energy efficiency in public buildings and street lighting. The former also benefit from the potential to implement photovoltaic generation in buildings. An appropriate regulatory framework should be created in order to attract investments. Mechanisms to be considered for enhancing this framework could include security for first losses from loans, an increase in scale, especially for small projects, by means of aggregation, the standardisation of processes and methodologies to reduce the risk of the parties.

²³⁸ [Renewable energy performance contracting in the tertiary sector Standardization to overcome barriers in Greece - ScienceDirect](#)

²³⁹ [Greek utility launches EPC tender for 550 MW of solar at former coal mine - pv magazine International \(pv-magazine.com\)](#)

13 Hungary

Comparison previous status

A review of the JRC reports of 2021 and 2019 show that there is uncertainty about the status of the market. The number of contracts was situated around 20 in the JRC report of 2019 and between 10 and 50 in the JRC report of 2021. The latter report estimated that the market size was some €2.8m for the period 2018-19. There was an apparent loss of interest in the market on the side of providers due to lack of business and political uncertainty. As a result, in 2019 there were some 4 operators actively providing EnPC to the public sector. To date there is no official registry nor official requirements of reporting for ESCOs.

Current Status highlights

In the LTRS, the Hungarian government expected EnPCs to take off on the basis of measures to address confidence issues through changes in accounting to incorporate aspects of price-change settlement, and shared savings. (The introduction of off-balance contract models was planned for 2023-27). There were also plans to renovate health buildings using ESCOs in the period 2020-22, however no reference to the use of EnPC or the realisation of these renovations has been reported. Additional development of the EnPC market could have derived from potential measures indicated in the LTRS including green bonds, establishment of a guarantee bank, and green interest rebates. The introduction of EEOs, described in the NECP, appears to have helped EnPC markets to develop, as highlighted in the EU Survey 2022. The impact of the RRF in EnPC markets is unclear since limited references to energy efficiency investment are made in the RRP (the focus relies instead on the deployment of renewables and the electrification of heating). No national expert opinion about it was received in the EU Survey 2022.

The EU Survey 2022 indicates that during the period 2020-21 there was a some take off in the market, especially in the private sector. A total number of approximately 30 contracts with an overall volume of €15m were reported. There are however uncertainties about the understanding of EnPC by respondents. It is difficult to assess the size of the market and hybrid models operated by energy efficiency contractors are often confused with ESCO and EnPC models.

The EU Survey 2022 indicates that most activity takes place in public lighting (rated frequency 2/3), and there are claims about the existence of some activity in smart grids and public buildings (both 1/3). (Some expert participants in the EU Survey claim a larger relevance of public and private buildings by rating them both as 3/3; whilst other sources which indicate an absence of implemented projects in the renovation of public buildings (“no public building has been renovated by this way yet” - EnergiaKlub 2021). Studies for municipalities to engage with EnPC have been conducted but there is no information on these having materialized.²⁴⁰ Project pools are uncommon. Most projects involve maintenance, replacement of elements (modernisation of heating systems, indoor lighting) or integral renovations, installation of renewables, monitoring and verification, audits (all of them had their frequency rated as 3/3). Design and planning is also relatively relevant part of EnPCs (2/3). ESCOs are also reported to be active in industrial and district heating modernisation, but EnPC experiences were not identified.

The table below summarizes the data gathered on market and contract sizes.

²⁴⁰ [3_dontesker0_inditvany_secap_elfoqadasa.pdf \(miskolc.hu\)](#)

Table A 87. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Number of contracts			10-50	
Overall size m€			1-30	
Typical* size m€			0.1-0.6	
Typical* duration			10	
Typical* payback (yrs)			9	
Typical* % of baseline			22.5	
Typical savings* MWh/year				
Typical savings* m€/year			0.06	

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 88. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable/Slow take-off	Slow take-off	EEOs being implemented since 2020
Perspective 2022-2024	Slow take off/ Rapid take-off	Rapid take-off	

Source: EU Survey 2022

Status of the business environment

The sufficiency of and quality of services of provision and facilitation is reviewed in the following tables.

Table A 89. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	2	1.5	2.5	There are at least 11 ESCO providers
Facilitators	1	1	1	
One-stop-shops	0	0	0	
Financing actors willing to support EnPC	1	0.5	0.5	
Other				

Source: EU Survey 2022.

Table A 90. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	0.5	0.5	0.5	
Willingness	1.5	1.5	1.5	

Source: EU Survey 2022.

Contract modalities and alternatives

A review of the contract modalities in place (see table below) shows that only shared savings has some presence in the country, especially in the private sector (the highest frequency rating was granted to shared savings models in the private sector rated 1/3), and that all other service contract modalities considered in

the EU Survey 2022 are more prevalent. In particular, BOOT and Energy efficiency contracts are considered to compete directly with EnPC.

Table A 91. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	0		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	1		
Build-own-operate-transfer (BOOT)	2	2		Compete with EnPC
Contract energy management (chauffage)	2.5	2.5		
Facility management	3	3		
Consultancy and technical guarantee	3	3		
Energy efficiency improvement contracts	2	2		Compete with EnPC
PPPs	2	2		
Other				

Source: EU Survey 2022.

Regulatory framework

According to consulted experts in the EU Survey 2022, there is no official list of ESCO providers nor a standard reporting practice, it is not clear what can/should be considered as an EnPC contract, and there are no good practices, guidelines, and examples in Hungary. This has implications for the reliability of the data collected since it appears that the different experts have diverse understandings of EnPC and their estimates seem not to rely on complete information either.

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets is generally poor, and only the implementation of Energy Audits attains a rating of 2 out of 3. Of note, the Ministry of Energy and domestic development has since 2022 shown signs of interest in EnPC as a mechanism to renovate public buildings, included municipalities (TOP Plus financing instrument).

Table A 92. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	0		Inexact definition
EnPC Guidelines	1		
EnPC Model contracts public sector (whether off- or on-balance sheet)	0.5		Unclear settlement mechanism client-provider
EnPC Model contracts private sector	0.5		
Lists of EnPC qualified operators	0		No official list
One-stop-shops	0		
Other information instruments	0		
EnPC demonstration projects	0		
Obligation schemes /White Certificates	1		
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		
Government rules and practices of procurement, contracting and tendering	0		

Source: EU Survey 2022.

Financing

According to the EU Survey 2022, budgetary limitations in the public sector result in restrictive annual financing planning, and control on municipality budgets. No barriers have been identified about the combination of EU funds and EnPC. However, responses to the EU Survey 2022 indicate that grants have no role in the financing of EnPC in Hungary, largely because these do not have performance requirements, and hence the beneficiaries proceed to conventional contracting of works. High interest rates in the reported period have been also against the use of EnPC. Identified opportunities for financing EnPC are hybrid grants and market-based financing, mainly from commercial banks.

Table A 93. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	0	0		
Provider funds	3	3		
Third-party Public funds	2	1		
Third party Private funds	0	0		
Private financing inst.	0	2		
Public financing inst.	0	2		
Debt financing	0	0		
Guarantees and guarantee funds	0	0		
Equity financing	0	0		
Mezzanine financing	0	0		
Project financing	3	3		
Leasing	0	0		Not allowed in Hungary
Special Purpose Vehicles	1	2		
Grants	0	0		
Forfeiting	0	0		
Other				

Source: EU Survey 2022.

Barriers

Based on the EU Survey 2022, the major barriers to the development of EnPC markets in 2020-21 refer to a context where energy efficiency has not been promoted and energy prices have been kept low, and where grants and subsidized loans have encouraged project financing and direct contracting. According to the Interreg E-Central project report, "As a result of lack of incentives and practical knowledge on these innovative forms of financing, municipalities tend to use more traditional financing methods for renovating its buildings" (EnergiaKlub 2021).²⁴¹

In the public sector, there are problematic procurement and tendering rules for ESCOs to offer their services. In the overall market, there are regulatory barriers and uncertainties, as well as a lack of information and best practices of financing and implementing EnPC. On top of this, negative experiences in the implementation of PPPs in the past, which resulted in disadvantageous conditions for the public sector, continue to burden the perception of ESCO models and keep decision-makers away from ESCOs. Continued issues of regulatory, financing and procurement nature are expected to limit market development in 2022-23 were identified in the EU Survey 2022.²⁴²

Eurostat treatment of EnPC

According to the EU Survey 2022, changes and clarifications on the **Eurostat treatment of EnPC** in government accounts have not been of impactful in the use of EnPC (rated as 0 in a scale of -2,+2). The off-balance option is largely unknown in the public sector. For these contracts to be adopted, there is a need of

²⁴¹ [Experiences with energy performance contracting in Hungary – Interreg \(interreg-central.eu\)](#)

²⁴² Similarly to the input gathered in the EU Survey 2022, the Interreg Project E-central also identified as barriers the unbalanced expertise between ESCO providers and clients, particularly municipalities, which results in uncertainty and lack of trust on the part of the latter; absence of legal regulation and institutional background for renovating with EPC; shortage of state-level incentives for building renovation, and the existence of messages and energy pricing policies that hinder investment in energy efficiency and expand payback times beyond the acceptable terms for ESCOs ([Experiences with energy performance contracting in Hungary – Interreg \(interreg-central.eu\)](#)).

changes in the legal framework of procurement and enabling longer commitment periods. However, there is a reported presence of off-balance treatment for contracts in local governments.

Drivers

The major drivers identified in the EU Survey 2022 for 2020-21 are the establishment of EEOs, the limited borrowing capacity of the public sector, and the limited in-house expertise in the private sector. Limited borrowing capacity in the public sector and, overall, increasing energy prices and implementation of EEOs as of 2020 are expected to drive increased demand for ESCO and EnPC models in the 2022-23.

EU support

The expert assessment of EU Support in the EU Survey 2022 shows especial appreciation towards technical assistance through ELENA (rated 2 in a range from -2 to +2), and InvestEU, found particularly interesting for financing actors (rated 2). However, the funds to support preparation of ELENA applications are found insufficient. InvestEU is insufficiently known. The selection criteria for both mechanisms and the risks involved for applicants are also found problematic. Accordingly, there are sectoral calls for EU mechanisms to facilitate proposal preparation and submission. No expert input was obtained on the potential impact of the RRF.

Feasibility studies conducted in 2021 as a part of a pilot project supported by Interreg's eCentral project (Energy Efficient Public Building in Central Europe) developed a "best practice for nZEB target achievement" in a pool of buildings consisting of a kindergarten and two swimming pools. The studies and process conducted so far are reported as innovative in a context where ESCO financing is uncommon and absence of experience in the EnPC renovation of public buildings (EnergiaKlub 2021).²⁴³

²⁴³ Most updated information on the project from 2021 does not refer to the implementation phase as having been initiated [Pilot-2-Bokay-Budapest.pdf \(interreg-central.eu\)](#)

Table A 94. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	2	2		2	Insufficient support for preparation of ELENA applications, tight criteria and risks for applicants	
Guarantee Facility of the Smart Finance for Smart Buildings initiative						
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)						
InvestEU	1	1		2	Not widely known; tight criteria and risks for applicants	
RRF						
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit						
European Green Deal, Fit for 55	0	1		1		

Source: EU Survey 2022.

Perspective

There are expert expectations, reported in the EU Survey 2022, for privately own buildings, industry and DMS to develop, contributing to a rapid growth of the market

Recommendations

The series of recommendations identified in the EU Survey 2022 and the consulted literature indicate the need of integral support, starting with the adequate implementation of the EED as related to support to energy services:²⁴⁴

- National financing of EnPC through state-backed energy efficiency/green funds, or dedicated loans with preferential interest rates for ESCOs;
- Clear narrative, price messages and policies to enable investment in energy efficiency, especially when this involves contractual commitments extended over years;
- National development of standard contract templates with stipulations for performance;
- Establishment and maintenance of a list of ESCO companies, requirement of providers to report the contracts concluded, creation of an accreditation system;
- Initiation of pilot projects in the public sector;
- Establishment of out of court complaints settlement mechanism specifically for ESCO projects;
- Development and dissemination of off-balance models for public bodies;
- Eligibility of ESCOs needs to be clarified in calls for tenders, in the energy efficiency obligation system, (Act LVII of 2015 on Energy Efficiency) and tax reliefs on energy efficiency investments (which discriminate ESCOs – Act LXXXI of 1996 on corporate Tax and Dividend Tax).

²⁴⁴ MultiContact Consulting Kft. 2020. Executive Summary. Hungary: Modernisation of Public and Residential Buildings –Identification and Elaboration of Support Programme. European Bank for Reconstruction and Development. <https://www.ebrd.com/documents/comms-and-bis/energy-efficiency-hungary.pdf>

At the EU level there is a need of simpler technical assistance support application process, or specific support to facilitate preparation and submission of applications for technical assistance.

Good practice

The Interreg E-Central project assessed the situation for renovating a pool of three municipal buildings to NZeB standard has been presented as a good practice²⁴⁵ and could serve as a model for new public sector initiatives to take off in a context of higher energy prices, especially if regulatory and policy uncertainty is overcome.

²⁴⁵ [Experiences with energy performance contracting in Hungary - Interreg \(interreg-central.eu\)](https://interreg-central.eu)

14 Ireland

Comparison previous status

The Irish market has continued its slow take off, reported for the public sector in the previous JRC report (2021), achieving maturity in Dublin and further developing in the public sector where a long-expected change of government attitude towards EnPC as reported in JRC 2021 appears to have taken place. Based on the data available, experts are uncertain about the level of activity in the private sector market, and whether this has slowly taken off or not.

The LTRS indicated that the ESCO market was preliminary in the Country, outside Dublin, and that SEAI (the Sustainable Energy Agency of Ireland) is supporting EnPCs through training and expertise for public and private sectors. EnPC is mentioned in the Irish Climate Action Plan. SEAI has proceeded with plans to deliver facilitation planning, which is expected to further develop in 2023. Direct support to ESCOs and EnPC was not mentioned in the RRP. The projects GuarantEE (2016-2019), NOVICE (2017-2020), SPEEDIER SME (2019-2021), DeliverEE (2021-2024) and SMARSPIN (2021-2024) have been or are active in developing and supporting mechanisms potentially relevant for the adoption of EnPC models.

Current Status highlights

The most common intervention sites, according to the EU Survey 2022, are public buildings (2.7/3), mainly hospitals and municipal buildings. Private buildings, mainly in the warehouse and distribution industry, and district heating and cooling are less common both (1/3) and public lighting interventions were not reported. Some interventions take place in the pharma industry (2/3).

The main implementation of the EnPC model involves a combination of shared and guaranteed savings models (frequency of use was rated 1.5 and 1 out of three respectively for public and private markets), and there is a model of energy efficiency improvement contracts with limited guarantees (EnPC lite) which is relatively common in the public sector (1/3). The public sector is characterized by sizeable projects, especially in the public health sector and relatively long of 8-10 year-long contracts. Yet, integral renovations are not the norm, leading to expert concerns about low hanging fruits being picked. Interventions tend to involve maintenance, replacement of specific elements (HVAC, lighting), monitoring and evaluation, (all three rated 3/3), installation of building and plan control or renewables (both rated 2.5/3), and to an extent integral renovations (1.5/3). Flexibility and storage systems are gaining relevance, especially in the private sector (3/3).

An increase in the relevance of renewable generation has been observed in the period 2020-2021. For the period 2022-2024 it is expected that public projects engage with deeper renovation.

The table below summarizes the data gathered on market and contract sizes.

Table A 95. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	5	7		
Overall size m€	22	10		Two hospitals (~€15m) + One District Heating project (ESC, ~€8m), and two public buildings ~€1.5m
Typical* size m€	0.5 or 5-10	1		Public contracts are either small (€0.5m) or large (€5-10m)
Typical* duration	9	5		
Typical* payback (yrs)	8	3-5		Public sector payback of 6 years or more than 10 years
Typical* % of baseline	35	25		i.e. 30-40% and 20-30%
Typical savings* MWh/year				
Typical savings* m€/year	0.05-0.5	0.2		

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 96. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Slow take-off	Slow take-off / Did not take off	Relatively stable markets, with slow uptake of EnPC, especially in the public sector.
Perspective 2022-2024	Upward	Upward/ Slow take-off	N/A

Source: EU Survey 2022

Status of the business environment

Based on the EU Survey 2022, the number of providers, facilitators is stable as compared with the JRC report of 2021. A barrier, also reported in the JRC report of 2021, is the limited (and apparently diverse) understanding of and willingness to engage with EnPC to engage of clients and financing actors.

Table A 97. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	3-15	1.5	2.5	Only 1 provider works with small projects (<€1m)
Facilitators	2-5	1.7	1.5	Ongoing training
One-stop-shops	0			
Financing actors willing to support EnPC	4 (2-5)	2	1.5	Private financing is available, need awareness and understanding
Other				

Source: EU Survey 2022.

Table A 98. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	1	
Willingness	1	1.3	1.3	

Source: EU Survey 2022.

Contract modalities and alternatives

A review of the contract modalities in place (see table below) shows that the national use of the model blends guaranteed and shared savings. This model is more used in the public sector than in the private sector but it is relatively uncommon. Several other contracting modalities, mainly PPPs, Facility management and Consultancy with technical guarantee are widely used. None was described as directly competing with EnPC.

Table A 99. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1.5	1		The national use of the model blends guaranteed and shared savings, as the contractor also invests own capital
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1.5	1		
Build-own-operate-transfer (BOOT)	1	2		
Contract energy management (chauffage)	1	2		
Facility management	2	2		
Consultancy and technical guarantee	2	2		
Energy efficiency improvement contracts	1	0		These have some performance guarantees "EnPC lite"
PPPs	2.5	1		
Other				

Source: EU Survey 2022.

Regulatory framework

The regulatory framework has limitations and although the mechanisms required in the EED are in place, there remains definition confusion, and unclear listing of operators. The most appreciated mechanisms are the development of model contracts (2.3/3 in the case of public sector contracts), the implementation of audits (2/3), the government rules of procurement (1.7/3), and the publication of guidelines (1.7/3), with new publications upcoming.

The EnPC model is considered to have a relative relevance in the public sector performance (1.3/3), and whilst some actors have claimed that the “public sector had a piloting role”, experts consider the impact of public sector adoption of EnPC on the private sector to be limited (0.3/3).

Table A 100. Experts’ perception of the MS’s implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	1.3	SEAI work ²⁴⁶	Different understandings
EnPC Guidelines	1.7	SEAI work	
EnPC Model contracts public sector (whether off- or on-balance sheet)	2.3	SEAI work	
EnPC Model contracts private sector	2.3		Diverse appreciation amongst experts
Lists of EnPC qualified operators	0.3		
One-stop-shops	0.5	DeliveREE project developments	
Other information instruments	1		
EnPC demonstration projects	1.5		
Obligation schemes /White Certificates	1.5		
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies’ buildings)	0.7		
Government rules and practices of procurement, contracting and tendering	1.7		

Source: EU Survey 2022.

Financing

The financing sources are well distributed between client funds, provider funds (mostly from private financing institutions) and public financing. There has been incompatibility of EXEED grants with EnPC for the private sector- This has been remediated in new calls for applications. These include a model contract to support ESCOs and include preparatory studies as eligible costs. However, the experts’ input to the EU Survey 2022 indicates public funding and grants to be of little relevance during the reported period (2020-21). The most common practice is to blend client, ESCo (from private finance providers) and grant funding.

²⁴⁶ <https://www.seai.ie/business-and-public-sector/business-grants-and-supports/energy-contracting/>

Table A 101. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	2	1		
Provider funds	1	2		
Third-party Public funds	2	0		
Third party Private funds	2	2		
Private financing inst.	1	2		
Public financing inst.	2	0		
Debt financing	1	1		
Guarantees and guarantee funds	0.5	0		
Equity financing	2	1		
Mezzanine financing	0	1		
Project financing	0	1		
Leasing	0	2		
Special Purpose Vehicles	1	1		
Grants	2	1		
Forfeiting				
Other				

Source: EU Survey 2022.

Barriers

The major barriers identified in the EU Survey 2022 for 2019-2021 are limited understanding of the model (with different interpretations available, mainly without incorporating service and maintenance) and a lack of suppliers, especially to conduct small projects, and capable facilitators.²⁴⁷ Specifically, in the public sector, there has been a lack of Government sanction, efforts towards adopting off-balance treatment, and a focus on low hanging fruits. In the private sector, access to grant funding through an EnPC route and incentives to retrofit were not available during the reported period. The same barriers were indicated as problematic for the period 2022-2024, with the exception of new expectations on the eligibility of ESCO projects for EXEED grants.

Although the participants in the EU Survey 2022 claimed that no contract alternative competes directly with EnPC, a diversity of contract modalities are well rooted in both the public and private sector and may hinder demand for EnPC. These include Facility management (reported as a barrier in JRC 2021), Consultancy and technical guarantees, and PPPs in the public sector; as well as Facility management, BOOT, and Chauffage in the private sector. Major growth has been identified in local energy supply contracts and energy performance guarantees associated to renewable generation in the private sector.

Eurostat treatment of EnPC

The Eurostat treatment of EnPC respect to financial balances of the public sector has no effect in Ireland. Off-balance contracts were produced but not sufficiently updated, and have not been sent for review of Eurostat. Although according to the consulted experts, EnPCs in Dublin and about 20% of them nationwide do not compute as debt for the implementing bodies, public sector budgetary constraints and public sector spending code requirements remain a major concern.²⁴⁸ The National Development Finance Agency (NDFA) has been

²⁴⁷ To this barrier has contributed the underutilisation of the national technical assistance scheme for EnPC, which has been developed alongside the training of facilitators.

²⁴⁸ Off-balance contracting has been identified to refer to buildings which, having a public service are privately owned, such as hospitals, and which account EnPC as off-balance in accordance with IRFS. The mechanism used in Dublin and other municipalities to keep off-balance EnPC investment deserves further review.

tasked with developing Ireland's approach to off-balance contracting. There is a large potential for recognizing the guarantees agreed in EnPC contracts and to remove budgetary limitations on public bodies.

Drivers

According to the EU Survey 2022, EnPC development has been driven and is expected to continue to be driven by interest in the public sector and a number of projects, some of which are in planning for 2022-2024. In addition to capital limitations and the recast EED and EPBD has had a positive effect. The use of EnPC in the public sector has had a piloting effect. Policy developments with a positive impact on the markets include the Irish Climate Action Plan commitment to deliver €1b in EnPC projects by 2030 (initial investigations are still underway); training of EPC Facilitators delivered during 2022.

For the period 2022-2024 there are expert expectations on the establishment of a register of qualified facilitators; the relaunch since 2022 of a technical support scheme for EnPC, and the ongoing realignment of grant schemes with EPC models. Moreover, SEAI's Pathfinder Programme is testing technical, financial and governance solutions and encourages EnPC in pursuit of public sector targets for energy efficiency by 2030, the H2020 DeliverEE project is expected to improve understanding and competency amongst local authorities, and there are plans for aggregating public projects. In the private sector, increased drive for reducing energy costs, stronger net zero goals and increased carbon tax and ETS prices are expected to drive demand for EnPC. Assessment by the National Development Finance of the treatment of EnPC in national and local accounts could enable the expansion of the model.

EU support

According to the EU Survey 2022, with the exception of RRF and ESIF, EU support mechanisms receive a positive evaluation between 1 and 2. The European Green Deal, the Recasting of EED/EPBD, the task force on financial disclosures, the new taxonomy and the availability of EnPC finance were reviewed as having strengthened impetus at a national level, and increased confidence in the EnPC model.

The projects GuarantEE (2016-2019), NOVICE (2017-2020), SPEEDIER SME (2019-2021), DeliverEE (2021-2024) and SMARSPIN (2021-2024) have been or are active in developing and supporting mechanisms potentially relevant for the adoption of EnPC models.

Table A 102. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1.7			0		H2020 PDA (DeliveRE E) and ELENA are appreciated for supporting facilitation
Guarantee Facility of the Smart Finance for Smart Buildings initiative	1.5			0		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	1			0		
InvestEU				0		
RRF	0			0		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	1			0		
European Green Deal, Fit for 55	1	0.5		0		

Source: EU Survey 2022.

Perspective

The current context of increased energy prices and improved support points at a growth of the EnPC market, especially in the public sector during the period 2022-24.

Recommendations

Besides successful adoption of upcoming mechanisms (largely in relation to the implementation of the Irish Climate Action Plan), participant experts in the EU Survey 2022 believe that a key for the market development is the development of mechanisms for the aggregation and scaling up. These are considered necessary to deal with limitations of project size and for these to be interesting to providers. Greater focus on guarantee mechanisms was also considered important – same as in JRC 2021. Recognition of the contractual guarantees in EnPC should serve the National Development Finance Agency to reconsider the treatment of these contracts in the accounts of public bodies, and for RRP allocation through financial instruments able to create guaranteed savings and to engage private financing.

Expert recommendations addressing EU support involve:

- Greater flexibility and focus on target achievements, for contracts to focus less on the financial benefits of EnPC and more on the service and guarantees which are important for clients, for these to be better informed and to bear less financial risk (currently financing actors are considered to be the best informed actors in the market).
- Increased support for raising awareness and provision of consolidated information (e.g. a repository of case studies, best practice examples, further development of networks and fora, included CAEED, CAEPBD and the SEI forum, for the exchange of EnPC knowledge, continued access to relevant expertise e.g. of the EIB Advisory HUB, and enhanced financial advisory support).
- Communication on the potential for off-balance treatment of EnPC in the accounts of public bodies provided contract standards and legal enforcement are in place.

15 Italy

Comparison previous status

The JRC report of 2021 described the public sector market in Italy to be a sizeable and fast-growing market.²⁴⁹ The market was found to be the largest in Europe, with 230 projects reported for 2018-19, and a size of €250m. The market was also described as well supplied in terms of providers and facilitators. Off-balance contracts were already available in the period, and there are capacities to bundle projects, largely developed through Technical Assistance support. Contract duration was counted amongst the longest, in the group of countries where contracts are longer than 8years. High energy savings in projects were attributable to a high proportion of public lighting projects, along with public buildings and some interventions in DHC. Expert insight gathered for the JRC report of 2021 predicted a continued growth of the market.

The NECP (2019) and the LTRS (2020) paid dedicated attention to EnPC. The NECP referred to the availability of EnPC guidelines (from Enea), the use of Conto Termico (grants for public building measures tied to energy services from GSE),²⁵⁰ contract development, quality control mechanisms, simplified administration, and the possible introduction of energy managers. The NECP also emphasized barriers in the use of EnPC and PPP as linked to bonuses and the NEEF and a need of greater standardisation and assessment of risks of EnPC, in part to gain support of green mortgages for multifamily buildings. The LTRS further addressed EnPC through financial measures involving simplification and promotion of EnPC in combination with the Conto Termico. It also highlights projects in social housing retrofit using EnPC, and indicates the use of de-risking tools, guarantee funds, and tax relief bonuses (Eco-, Super- and Sisma-bonus for private buildings and social housing), WhCs addressed to incentivise investment in building renovation and DHC, and the development of green bonds. Emphasis on simplification and competition in administrative processes is also made in the RRP.²⁵¹ According to the EU Survey 2022, although banks and ESCOs are eligible for the SuperEcoBonus, which covers 110% of renovation costs,²⁵² the impact of the bonus mechanisms on EnPC markets is considered negligible. There is even the risk of the SuperEcoBonus having hindered the market. The impact of WhC is limited to the public lighting domain.

Current Status highlights

According to the EU Survey 2022, the most common intervention sites are public lighting (frequency rated 3/3), and public buildings (frequency rated as 2.5/3). However, the savings over the baseline reported are relatively low and to indicate a high proportion of public lighting projects. Project bundles are common (2.5/3), and related to requirements of financial incentives (Superbonus). Industrial co-generation and DHC are also active in the use of EnPC (2/3 and 3/3 respectively). The main type of interventions in buildings involve renewables, demand flexibility and storage (both rated 3/3), integral renovations (2/3) and installation of building control systems (2/3). Monitoring and evaluation, and audits are of less relevance (both rated 1/3). This seems to indicate a lax understanding of EnPC in some cases. Also, there has been an increased attention to renewables, and integral renovations in the residential sector. There are concerns about audit requirements in the use of WhCs related to a lower support to EnPC in public lighting and industry. During the period 2020-21 there has been increased utilization of EnPC (and PPP overall) for renovating public buildings as the result of increased confidence in public markets, and awareness about their potential amongst public bodies.

The table below summarizes the data gathered on market and contract sizes.

²⁴⁹ JRC 2017 had found the Italian EnPC market to be at initial stages.

²⁵⁰ <https://www.gse.it/en/what-we-do/energy-efficiency>.

²⁵¹ [EUR-Lex - 52021SC0165 - EN - EUR-Lex \(europa.eu\)](#)

²⁵² The SuperEcoBonus has been highlighted as a best practice in the review of the Commission ([Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#))

Table A 103. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	50	50 (industry only)		Major estimate variability
Overall size m€	50	15 (industry only)		Major estimate variability
Typical* size m€	1	0.2	0.7	
Typical* duration	10	5-10	8	
Typical* payback (yrs)	8	3-6	6	
Typical* % of baseline	30	10-20	25	
Typical savings* MWh/year		20-25		
Typical savings* m€/year		0.07		

Source: EU Survey 2022

The level of expertise amongst clients and, especially, of financing actors is considered limited (ratings around 1 out of 3) and relates to a lack of information, independent facilitators and quality one-stop-shops. On the other hand, there is relatively high degree of willingness in the public sector (rated 2/3). The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 104. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Uncertain: Downward / Upward	Uncertain: Downward / Rocketing	Highly variable expert estimates
Perspective 2022-2024	Upward	Upward	

Source: EU Survey 2022

Status of the business environment

The sufficiency of providers was assessed (see table below) as good, and the experts assessed variably the number and sufficiency of facilitators as well as of One-stop-shops.²⁵³ Diverse estimates, in general, show a high degree of fragmentation in the market and lack of consolidated data.

²⁵³ This may be due, as explained by one expert, to some facilitators operating as sale agents of providers and not actual independent advisors.

Table A 105. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	10 -1000	2	1.5	There 10 major operators and about 1000 small certified ESCOs which largely operate like facilitators
Facilitators	<100-1000	1-3	1	There are many facilitators operating as sales agents
One-stop-shops	30-125	1.5	1	Public bodies, not always experienced
Financing actors willing to support EnPC	0-10	0	0.5	Risk awareness, lack of expertise
Other				

Source: EU Survey 2022.

Table A 106. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1.5	0	Need information and independent facilitation
Willingness	2	1	0	

Source: EU Survey 2022.

Contract modalities and alternatives

A review of the contract modalities in place (see table below) shows that both EnPC with guaranteed savings and with shared savings are widely used in both the public and private sectors (all of these options were categorized as “common”), and being used to similar extent to other contracting options. Chauffage and Facility management are the two contract modalities that are reviewed as slightly more common than EnPC. No contract modality is considered to compete with EnPC.

Table A 107. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	2	2	2	
EnPC with shared savings (both parties share the savings, contractor take financial risk)	2.5	2.5		
Build-own-operate-transfer (BOOT)	2	2		
Contract energy management (chauffage)	3	3		
Facility management	3	2.5		
Consultancy and technical guarantee	2	2		
Energy efficiency improvement contracts	2	2		
PPPs	2	0		
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of EScO and EnPC markets (See table below), EnPC definitions, the use of One-stop-shops, information instruments, and use of EnPC in fulfilment of the exemplary role of public bodies' buildings were rated as either absent or barely acceptable. Model contracts, lists of qualified operators, guidelines, audits and government rules were rated in the ballpark of "good". Highly diverse ratings were estimated by participants.

Table A 108. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	0-1	Assoesco proposals	Definition from ESD (2006)
EnPC Guidelines	1-2		Lack of political attention
EnPC Model contracts public sector (whether off- or on-balance sheet)	1-2	Adaptation to new European standard (2022) expected in 2023 ²⁵⁴	
EnPC Model contracts private sector		Several projects available, needing reference standard	
Lists of EnPC qualified operators	2	See ²⁵⁵	Certification requirements may need update
One-stop-shops	0-1		Lack of adequate expertise and relation with private
Other information instruments	0		
EnPC demonstration projects	0		
Obligation schemes /White Certificates	1-3		Reported uncertainty in last 6 years
Energy Audits	2.5	Mandatory for non-SMEs and energy intensive organizations	Need more control
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1	Used	Not communicated
Government rules and practices of procurement, contracting and tendering	1-3	Consip centralizes public procurement mechanisms	Limited information

Source: EU Survey 2022.

Financing

Although it is possible to combine EU funds and EnPC, the process has been described by experts participating in the EU Survey 2022 as complex. Major opportunities identified are facilitation support and the use of standardized model contracts to convince financiers. There are expectations towards the implementation of sustainability taxonomy implementation in finance for their potential awareness effect.

²⁵⁴ CEN CENELEC is announcing the final text approval (2022-11-23) of the European standard EN 17669:2023 Energy Performance Contracts - Minimum requirements. The completion of all national publication is expected by 2023-05-31.

²⁵⁵ <https://www.accredia.it/banche-dati/certificazioni/prodotti-e-servizi-certificati/esco-energy-service-company-certificate/>

Table A 109. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	2	2		
Provider funds	2	2		
Third-party Public funds	2	0.5		
Third party Private funds	1	2.5		
Private financing inst.	1	2.5		
Public financing inst.	2	0.5		
Debt financing	0	2.5		
Guarantees and guarantee funds	2	1		
Equity financing	1	1		
Mezzanine financing	0	0		
Project financing	2	0.5		
Leasing	1	2.5		Relevant in lighting projects and co-generation
Special Purpose Vehicles	1	3		
Grants	2	2		
Forfeiting	1	1		
Other				

Source: EU Survey 2022.

Barriers

The major barriers referred in the EU Survey 2022 for the period 2020-21 refer to the lack of clarity in the PPP framework, inadequacy and complexity of incentives in a context of lack of trained staff in municipalities, and lack of information and support. The latter relates to the allocation of public funds to municipalities (Consip) and which can be a barrier for municipalities lacking the capacity to demonstrate EnPC as more cost effective than tendering. For some experts, the use of WhC, considered of relevance in public lighting and industry, has gained complexity with the introduction of requirements to assess ex-ante the energy savings. In public lighting, it is often difficult to meet this requirement due to lack of monitoring to enable these assessments. The same barriers have been described for the period 2022-23.

Eurostat treatment of EnPC

Changes and clarifications on the **Eurostat treatment of EnPC** in government accounts have been of impactful in the use of EnPC and rated as 2 in a scale from -2 to +2 in the EU Survey 2022. The totality of contracts the public sector are considered by national experts to be off-balance. However, the off-balance models developed are considered insufficiently adapted to the context, and would need to be clearer, and define a baseline based on actual savings, through implementation of a M&V protocol.

Drivers

The major drivers identified in the EU Survey 2022 for the 2020-21 period are regulatory developments on PPP, ESG goals, financial incentives and increased interest for cost saving. Of note, financial incentives (Superbonus 110%) have pushed the bundling of projects in social housing (although costs have increased as a result). For the period 2022-23 the major drivers are the RRP (in the public sector), high energy prices, financial incentives, and concern about energy prices that motivates cost savings and concerns about future asset value.

EU support

The expert assessment of EU Support in the EU Survey 2022 is not overly optimistic about impact of EU Support mechanisms. Technical assistance the public sector receives the most appreciation (1.5 in a scale of -2 to +2). The Guarantee Facility of the SFSB initiative, the ESIF, InvestEU, and the European Green Deal, Fit for

55 and Next Generation EU packages receive ratings around 1 in the same scale, mainly for their impact on the public and financing sectors.

A diversity of EU projects have or are being implemented in Italy. The H2020 project LAUNCH– Sustainable energy assets as tradable securities (2019–21) worked on the production of standardized EnPC contracts and risk assessment protocols; EnerShift (2016–20) worked on the EnPC renovation of rented social housing. Currently, TIGER– Triggered Investments in Grouping of buildings for Energy Renovation (2021 –24) is working on the use of EnPC for social housing renovation; AmBIENCe (Active managed Buildings with Energy performance Contracting) (2019–22) is working on the use of smart technologies to support efficiency improvements through the combination of active technologies and EnPC; and NEON – Next-Generation Integrated Energy Services for Citizen Energy Communities (2021–2024) is developing a model for integration of EnPC and P4P schemes and innovative M&V methodology. (Previously Trust-EPC-South and GuarantEE had also worked on ways to scale up EnPC in Italy). Technical Assistance projects have also taken place. ELENA supported the EEEF to implement EnPC projects in public buildings, and streetlighting through Project Accelerate Powered (2017–21) (EIB 2021).²⁵⁶

Table A 110. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1.5	0.5		1		
Guarantee Facility of the Smart Finance for Smart Buildings initiative	1	0		0.5		
Structural and Investment Funds (2014–20) Cohesion Policy Funds (2021–27)	1	0		1		
InvestEU	1	0		1		
RRF	1	0		1		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0.5	0		1		
European Green Deal, Fit for 55	1	0.5		0.5		Increase awareness

Source: EU Survey 2022

Perspective

The effects of fiscal incentives are uncertain. The impact of Supebonus 110% on EnPCs has been described as very low to negligible and to even have a negative effect. There is also uncertainty about whether energy prices and interest for renewables may attract clients to EnPC. It is expected that the RRP will increase attention towards EnPC, in the framework of more PPPs in public buildings, and the integration of renewables. Further integration of efficiency measures in the residential sector is expected, along with growth in this segment of the market.

Recommendations

The experts consulted as a part of the EU Survey 2022 called for improvement of the off-balance models for these to rely on a common standard and to be developed to define a baseline based on actual savings and require the implementation of a M&V protocol. There are expert demands for the WhC mechanisms to be

²⁵⁶ [56-project-factsheet-eeef.pdf \(eib.org\)](#)

realigned with EnPC projects in industry and public lighting, and for the avoidance of grant support being allocated with high grant ratios (Superbonus 110%).

Moreover, there is a potential for developing independent of facilitation capacity, through training and certification, as well as the development of regional one-stop-shops, and for the consolidation of national data through registry of projects alongside improvements of the EnPC definition improvement of M&V implementation.

EU support mechanisms should, according to the EU Survey 2022, be supported with more and clearer information, awareness building and support to standardize the definition of EnPC. There is also a potential for a registry of EU projects to align with and support national efforts of communication and collection of good practices, as well as to improve the capacity to assess the advantages of opting for EnPC in different types of interventions.

Good practice

There are multiple successful experiences of energy efficiency projects in municipalities which involve bundling of buildings and relatively short projects and relatively high energy saving achievements. In Comune di Prato, for instance, a project involving 115 municipal buildings and a 7-year contract, finished in 2022 has led to a reduction in energy consumption of 35% and €150,000 savings per year.²⁵⁷

²⁵⁷ [Comune di Prato - Azioni del PAES](#)

16 Latvia

Comparison previous status

Multi-storey residential dwellings, built during 1945-1990, most of which are privately-owned by dwellers are largely inefficient and need deep renovations are the only of intervention in which EnPC has been involved. At the end of the socialist era, these buildings were handed over private owners in bad condition of maintenance. Investment has been lacking ever since. These buildings constitute the major final energy use in Latvia and have a large energy saving potential. It has been demonstrated that deep retrofits in these buildings can attain savings of between 45 and 65% for more than 10 years after contract finalisation, further improving comfort and extending the lifespan of buildings in 30 years.²⁵⁸

The EnPC market as reported in LTRS and NECP continued to be active mainly in private multi-apartment buildings. Due to regulatory barriers, there is no use of ESCO models in public buildings. Public bodies are not allowed to sign off-balance contracts that last more than 5 years.

Current Status highlights

Compared to the period 2017-2019, the Latvian EnPC market had a downward trend in 2019-2021. The type of projects has largely remained the same. In residential there were 1 contract signed in 2020 and 3 are in process to be delivered in 2023. But there were no projects in the period reported. Besides lack of activity in the residential sector, efforts in the public sector have not yet produced contracts. Some municipalities may conclude contracts in the near future. It has been that a new ambitious contracting modality involves 30 years guarantee for newly built residential buildings, aiming at NZEB, and incorporating a full LCA perspective. Developments

The main intervention typologies reported in the EU Survey 2022 are the replacement of specific building elements (boilers, piping systems, HVAC, lighting, and overall systems), the installation of integral control systems, and integral renovations, both in the public and private sectors. Whenever it is economically repayable, projects also involve the installation of on-site renewable generation, and storage capacity, which are gaining momentum with increased concerns about energy security. Maintenance is contracted only as a part of the warranty obligations. Integral renovations, integral control systems, generation and storage seem to have gained interest respect to the previous reporting period (2017-2019). Integral renovations and envelope interventions have been enabled since 2021 by subsidies of up to 50% for multi-family building renovations (currently provided by the State financial institute, ALTUM).

The tables below summarize the data gathered on market size, contract sizes, and market trends.

²⁵⁸ EBRD 2015. Latvian Baltic Energy Efficiency Facility ('LABEEF'). London. pp.145.

Table A 111. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
Number of contracts	0	1		Some LaaS in the public sector (technical guarantees)
Overall size m€	0	0.32		
Typical* size m€		0.32		Refers to residential buildings
Typical* duration		20		Refers to residential buildings
Typical* payback		12		Refers to residential buildings
Typical* % of baseline		48%		Refers to residential buildings
Typical savings* MWh/year		190		Refers to residential buildings
Typical savings* m€/year		-		

Source: EU Survey 2022 and projects reported by Effect4Buildings.

Table A 112. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Downward	Downward	There are new actors interested
Perspective 2022-2024	Upward/slow take-off	Upward/slow take-off	Driven by energy security and new actors

Source: EU Survey 2022.

Status of the business environment

Participant respondents of the EU Survey 2022 best appreciated the level of understanding and willingness to participate in EnPC markets of the financing sector. There are divergent opinions regarding these attributes for the public sector, likely due to the need of a more coherent regulatory and communication regime.

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 113. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	4	1	2	Only one actively contracting
Facilitators	1	1	2	Small market share
One-stop-shops	1	1	2	Ongoing developments in Riga and Vidzeme Region
Financing actors willing to support EnPC	2-5	2	2	Multiple financing actors
Other				

Source: EU Survey 2022.

Table A 114. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment

Understanding	1	1	1.5	
Willingness	1	1	1.5	

Source: EU Survey 2022.

Contract modalities and alternatives

EnPC operates with guaranteed savings. The only type of contract which is reported to compete with EnPC is Lighting as a Service (LaaS) without guarantees.

Table A 115. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	1		Four EnPC operators have signed contracts with ALTUM to finance projects using EnPC, but only 1 delivers real projects 259
EnPC with shared savings (both parties share the savings, contractor take financial risk)		0		
Build-own-operate-transfer (BOOT)		0		
Contract energy management (chauffage)		0		
Facility management	1.5	1.5		
Consultancy and technical guarantee	0	0		
Energy efficiency improvement contracts	1.5	1.5		Lighting as a service (LaaS) with technical guarantees
PPPs		0		
Other		0		

Source: EU Survey 2022.

Regulatory framework

There is a large discrepancy in the responses obtained from experts working in the provision and public sectors regarding the implementation of supporting policy instruments. Average values are presented in the Table. The best appreciated practices are the implementation of energy audits (ratings of 2 and 3 out of 3) and existing EnPC guidelines, followed by model contracts for both the public and private sectors, the role of EEOs, and government procurement rules and practices (combined ratings of 1 and 2 out of 3). EnPC definitions, guidelines, demonstration, and lists of qualified operators are less positively perceived by both type of actors.

²⁵⁹ <https://www.altum.lv/pakalpojumi/iedzivotajiem/daudzdzivoklu-maju-energoefektivitate/granta-pieteikums/>

Table A 116. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

EnPC Definitions: Rating (0-3)	1.5	
EnPC Guidelines: Rating (0-3)	2	
EnPC Model contracts public sector (whether off- or on-balance sheet): Rating (0-3)	1.5	
EnPC Model contracts private sector: Rating (0-3)	1.5	
Lists of EnPC qualified operators: Rating (0-3)	1	
One-stop-shops: Rating (0-3)	1.5	
Other information instruments: Rating (0-3)	1	
EnPC demonstration projects: Rating (0-3)	1	
Obligation schemes /White Certificates: Rating (0-3)	1.5	
Energy Audits: Rating (0-3)	2.5	
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings): Rating (0-3)	0	
Government rules and practices of procurement, contracting and tendering: Rating (0-3)	1.5	

Source: EU Survey 2022.

Barriers

General barriers in both the public and private sector are a lack of market experience, trust and the limited lateral of ESCOs. Financially, both the LTRS and consulted experts acknowledge the need of private financing. The LTRS acknowledges that there is a need of "more active involvement by investors and commercial banks, ensure the availability of attractive loans, development of appropriate financial instruments, development of ESCO services". There is also a need of long-term financing mechanisms, e.g. refinancing. Continued interest for low-hanging fruits along with strict legislation on EnPC are further deterrents for the market to take off. Changing this situation would require a strong commitment on the part of the central government.

In the private sector, decision-making processes in multi-family buildings is highly problematic. In the public sector, the LTRS reported as major barriers to the use of EnPC in public buildings the lack of certainty on the statistical treatment of EnPC in public investment. There is an off-balance contract model accepted by Eurostat, but the government does not seem to move towards its use in public buildings and services. Moreover, the maximum contract length for EnPC (or LaaS) is 5 years. Longer contracts would require the use of PPP. There are no indications about the combination of RRF with EnPC being legally possible.

Financing

The availability of financing takes multiple forms. Most projects depend on the availability of public funds. Capital grants are allocated to building owners, which then pay the providers. Public financing (3/3) and project financing (3/3) are the most typical form of EnPC project financing. Forfeiting and guarantee funds are of relative relevance compared to most other options (Both are rated as 1/3). There are no barriers to the combination of EU grants and EnPC in the private sector. Investment grants are allocated to clients, which then pay the EnPC providers (this applies to ESIF for 2014-2020 and to the RRF). In the public sector these mechanisms are not in place.

Table A 117. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds		2		
Provider funds		2		
Public funds		3		
Private funds		2		
Private financing inst.		2		
Public financing inst.		3		
Debt financing		2		
Guarantees and guarantee funds		1		
Equity financing		2		
Mezzanine financing		0		
Project financing		3		
Leasing		2		
Special Purpose Vehicles		0		
Grants		2		
Forfeiting		1		
Other		-		

Source: EU Survey 2022.

Eurostat treatment of EnPC

The Statistical treatment of EnPC in government accounts was a major barrier reported in the NECP and LTRS. The lack of off-balance sheet contracts has been a major deterrent of the Latvian market during the reported period (2019-2021). However, an off-balance model contract has been developed and accepted by Eurostat. It's impact on the market is uncertain given its limited activity and apparent lack of commitment of the government to adopt it.

Drivers

The major drivers highlighted by Survey participants are of structural nature, concerning energy security, the EU regulatory and support framework for retrofits and the situation of the housing stock. There are also expectations towards government actions to encourage EnPC. However, the RRP of Latvia²⁶⁰ granted limited to no relevance to EnPCs. The EC, in its review of the RRP, called for a strategy for ensuring long-term sustainable financing, and for the use of EnPC in public and tertiary buildings, as well as for developing the capacities necessary to foster innovative business models.²⁶¹ The actual implementation of the RRP is expected to determine the future of EnPC.

The major drivers according to sectoral experts are the status of conservation of the housing stock and the EU-regulation and support to residential retrofitting. The national regulatory and institutional framework described in the LTRS appears to pursue EnPC development and there is legislation for ALTUM to support EnPC e.g. by mediating and ensuring best contracting processes.²⁶² However, according to participant experts in the EU Survey 2022, these drivers are insufficient to overcome the market and regulatory barriers.

²⁶⁰ The country RPP could not be consulted in English (last consultation 19 August 2022) [ATJAUNOŠANAS UN NOTURĪBAS MEHĀNISMA PLĀNS \(esfondi.lv\)](#). These notes rely on an automated translation and information available on the EC website, included the review of the Commission [Latvia's recovery and resilience plan | European Commission \(europa.eu\)](#)

²⁶¹ https://ec.europa.eu/info/sites/default/files/com-2021-340_swd_en.pdf

²⁶² There is a legal framework allowing public bodies and multiapartment buildings to engage EnPC and government reports (LTRS, NECP), which show interest on the ESCO and collaboration with private financing institutions key to achieve energy saving goals and to maximise the effectiveness of available resources. In these documents EnPC appears mentioned as "energy performance contracts", "energy efficiency contracts", and "energy efficiency service contracts". According to the LTRS the MoE, MoF and ALTUM, the state-owned development finance institution have worked on overcoming regulatory barriers. ALTUM plays an active role in supporting ESCO and EnPC markets (LTRS)

There are expectations for recent developments to support EnPC in the future. These developments include efforts of ALTUM to direct green bond guarantees towards energy efficiency improvements (backed by the EIB, and PF4EE facility by the LIFE programme), recent developments enabling refinancing to be backed by loans, and loans made available to purchase cash flow of ESCOs (max €2m, below 45% of the financing, and max 20 years loans). There are expectations for these developments to support the development of EnPCs. Moreover, EEOs can be achieved through ESCO implementation and through contributions to the NEEF. LABEEF, the Latvian Baltic Energy Efficiency Facility refinances EnPCs for the renovation of private multi-apartment buildings to high EE standards.²⁶³

EU support

There are no reported barriers to the use of EU funding in EnPC projects. Based on expert responses to the EU Survey 2022, both Technical Assistance and ESIF can be considered to have relatively improved the capacities of the financing actors. There is consensus among experts about the positive role of the Guarantee Facility of the SFBi on the public, private and financing sectors (2/2). The role of RRF is unclear, since government and private sector respondents disagree on its impact, with the former considering that RRF will have a large positive impact (2/2) and the latter considering this impact negligible. Expert respondents agree on the need of improved information on the available EU funds for EnPC program support. The EGD appears to play a limited role in the EnPC, because it does not “coherently” pursue to facilitate EnPC.²⁶⁴

Experience with H2020 projects Sunshine (march 2015-February 2015), Accelerate (April 2017-March 2021) and QualitEE (June 2017-June 2020) has contributed to the sector capacity, and to the development of a procurement manual and quality assurance mechanisms. LABEEF has also received support from H2020 REFINE (June 2020-May 2023) which furthers the experience with the development of forfeiting capacities already supported by Sunshine and Accelerate and intends to assess and showcase the feasibility of state-backed refinancing.

Table A 118. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			1	1		
Guarantee Facility of the Smart Finance for Smart Buildings initiative						
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			2	2		
InvestEU			1	1		
RRF			1	1		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			0	0		
European Green Deal, Fit for 55			1	1	Not coherent, actionable mechanism	EGD creates motivation

Source: EU Survey 2022.

²⁶³ LABEEF works with support of EBRD and private investment, and uses its own quality and documentation standards, and contract models (EPC, EPC+ and EPC++) and has been a key player in H2020 projects.

²⁶⁴ As described by one respondent to the EU Survey 2022, “EGD creates a motivation for action but does not work as a coherent mechanism for the facilitation of such actions”.

Perspective

Upcoming development of the market (characterized as slow take-off / upward by Survey respondents) will be shaped by the implementation of the RRP. The latter represents an opportunity for its intend to improve the register of public procurement contracts, competition, and modernisation of the administration. The actual implementation of the RRP alongside developments in the incorporation of renewal generation and energy security concerns will determine the future development of the EnPC market.

Recommendations

Based on expert input to the EU Survey 2022, a series of recommendations for the Latvian government were listed:

- In public buildings, there is, foremost a need of government commitment, and to overcome regulatory barriers in the public sector (limitation of 5 years contracts), which would enable the use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings); a potential exists to implement the off-balance contract, accepted by the national statistical office and Eurostat in the implementation of the RRP;
- Improving communication and harmonisation of the applicable legislation to deal with a complexity of operational and financial schemes is needed to deal with the complexity of market options, and to enable long- term business models for investment to align with user needs (attention to building structures, comfort) and country targets of building renovation (continuation with experience in multi-family buildings and development of commercial buildings' market);
- Development of clearer guidelines and procedures, to address return uncertainty and reduce the cost of funding for providers, especially SMEs (whose current cost was reported as close to the cost of venture capital) (two key areas underdeveloped are SME providers, which face difficult finance conditions, and the provision of services for commercial buildings)

At EU level, the EU Survey 2022 collected demands for the EU to further communicate the availability of support mechanisms, and in particular of Technical Assistance for the deployment of off-balance contracts in the public sector, and the harmonization of national legislation. There is a potential for the EU level continued support for the use of grants to support owners' investment through EnPC for these to be used towards deep renovation of buildings. To overcome the focus on low-lying fruits, there is a need of action on the side of the EC in promoting the need of deep renovations to meet national and EU targets of energy saving and decarbonisation.

17 Lithuania

Comparison previous status

Already for the period 2018-2019, the JRC report of 2021 pointed at growth expectations for EnPC markets in Lithuania not having materialized. Around 3 projects were contracted in the period, with most interest involving public buildings and lighting, and district heating and cooling. Major barriers reported were the regulatory framework of PPPs, under which EnPC are treated, low energy prices, quality and sufficiency of provision, preference for conventional procurement, well established facility management contracts in the public sector, delayed adoption of off-balance contract models, negative perception of EnPC models along with mistrust towards providers, providers' interest for other models, and failure to incorporate them to the implementation of Art. 5 of the EED (exemplary role of public bodies' buildings).

Current Status highlights

Activity in Lithuania appears to be focused in the public sector, where EnPC operates under the guaranteed savings modality. Attempts to develop the private sector market are reported to have failed, resulting in loss of interest from service providers. According to the EU Survey 2022 and expert feedback, Lithuania's EnPC market is shared in similar proportion by interventions in residential public buildings and lighting (both 2/3).

Interventions take place in public-residential buildings and public lighting, promoted by VIPA. Building interventions involve to similar extent integral renovations, replacement of specific elements, installation of building control systems, on site renewable generation, storage and flexibility, and actions on monitoring and verification, and audits (2/3). Sometimes, facility management is integrated in EnPC (1/3). The type of interventions is referred as not having changed in recent years, and expected to remain stable. Due to the need for investment, energy poverty, and formerly low energy prices, the payback period in public residential buildings is more than 25 years.

The tables below summarize the data gathered on market size, contract sizes, and market trends.

Table A 119. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	4-8	No info		
Overall size m€	3-6	No info		
Typical* size m€	0.5-1	No info		
Typical* duration	14-20	No info		
Typical* payback	25+	No info		
Typical* % of baseline	30-40	No info		
Typical savings* MWh/year		No info		
Typical savings* m€/year		No info		

Source: EU Survey 2022 and projects reported by Effect4Buildings.

Table A 120. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Did not take off		due to low energy prices it is difficult to meet off-balance sheet criteria
Perspective 2022-2024	Slow take-off	-	Increase in energy prices

Source: EU Survey 2022.

Status of the business environment

Aligning with the situation reported in JRC 2021, the number of providers (2) and facilitators (5) operating in Lithuania was described by experts responding to the EU Survey 2022 as insufficient and having limited qualification to support the market development (all rated as 1/3).

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 121. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	2	1	1	
Facilitators	5	1	1	
One-stop-shops				
Financing actors willing to support EnPC				
Other				

Source: EU Survey 2022.

According to the EU Survey 2022, there is a low level of understanding and willingness to conduct EnPC amongst clients from both the public and private sector (0/3).²⁶⁵

Table A 122. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	0	0	2	
Willingness	0	0	2	

Source: EU Survey 2022.

Contract modalities and alternatives

The main contracting models in the public sector are facility management, and energy efficiency improvement contracts (3/3). The latter is considered to be in direct competition with EnPC and is possible that Facility management also acts as a well-established contract model that deters the adoption of EnPC (as such was reported in JRC 2021).

²⁶⁵ The financing sector rates better in these two domains (2/3) but was only rated by survey respondent representing a financing institution.

Table A 123. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1	No info		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	No info		
Build-own-operate-transfer (BOOT)	1	No info		
Contract energy management (chauffage)	1	No info		
Facility management	3	No info		Competes with EnPC (reported in JRC 2021)
Consultancy and technical guarantee	1	No info		Competes with EnPC
Energy efficiency improvement contracts	3	No info		
PPPs	1	No info		
Other				

Source: EU Survey 2022.

Regulatory framework

The EU Survey 2022 did not gather information on the implementation of the Regulatory framework. Major concerns refer to the treatment of EnPC as PPP in the national regulatory framework.

Financing

According to the EU Survey 2022 most financing originates from public funds (2/3) and provider funds (1/3). Public funds, through public financing institutions (debt financing) and grants are the most common financing mechanisms (all of them rated as 2/3). There are no reported incompatibilities between grant schemes and EnPC.

Table A 124. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	0	No info		
Provider funds	1	No info		
Public funds	2	No info		
Private funds	1	No info		
Private financing inst.	1	No info		
Public financing inst.	2	No info		
Debt financing	2	No info		
Guarantees and guarantee funds	0	No info		
Equity financing	0	No info		
Mezzanine financing	0	No info		
Project financing	0	No info		
Leasing	0	No info		
Special Purpose Vehicles	0	No info		
Grants	2	No info		
Forfeiting	0	No info		
Other				

Source: EU Survey 2022.

Barriers

A characteristic of Lithuanian projects is the long payback period, shaped by the low energy prices and deficiency of investment. Aligning with previously reported barriers, there is a reliance on subsidy and construction contracts, and a reluctance to adopt alternative models even though government subsidies are reported to be compatible with EnPC.²⁶⁶ There are also high costs associated to meeting regulatory and bureaucratic requirements in the PPP framework which EnPC have to meet to be off-balance, and to receive grant support. In the upcoming 2022-2025 period, the lack of data on energy consumption is expected to add to these barriers and to limit the driving potential of increased energy prices.

Eurostat treatment of EnPC

According to the EU Survey 2022, off-balance contracts have not taken off (0% of the market), largely due to low energy prices which, overall, disincentives investment and counter the financial advantages of EnPC models. The impact of the Eurostat update on statistical treatment of EnPC in government accounts is perceived negatively (-1 in a scale from -2 to +2). Treatment of EnPCs as PPPs counters the adoption of EnPC. For EnPCs in the public sector to be treated off-balance they need to meet rigid regulatory framework applicable to PPPs, which is furthermore difficult in a context of low energy prices, especially for non-residential uses. A way proposed for simplifying EnPC models and administrative procedures is to focus on their energy-saving scope and to contract other works through alternative mechanisms.

Drivers

The major driver highlighted in the EU Survey 2022 for the period 2020-2021 was the availability of investment grants. For the period 2022-2025 the main drivers are expected to be the increased energy prices (Lithuania had traditionally low prices and this barrier has been stated for the periods 2020-21 and 2018-2019), along with an improvement of the policy framework and the existence of project examples. No information was provided on the commitment of the public sector, especially at regional and local levels, to the EnPC. The role of VIPA as a facilitator which in the past had been indicated as relevant (Hayden and Eoin 2019) was not highlighted by respondents to the EU Survey 2022.

²⁶⁶ The National Promotion Institution, VIPA, has a variety of financial support instrument specific to different project typologies (municipalities, central buildings, lighting, multi-apartment buildings, renewable generation, amongst others).

EU support

Although in general EU support receives a significantly positive appraisal from experts (2/3 for all the support instruments besides the European Green Deal, Fit for 55 and NextGenerationEU package) participating in the EU Survey 2022, greater diffusion of EU initiatives and communication in Lithuanian, would be necessary. It is expected that the context of energy supply insecurity is more impactful than the EU Support and initiatives. The Green Deal received lower rating than other instruments (1/3), and a remark on its limited impact in a context of increasing energy prices was highlighted.

Table A 125. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			2	2		
Guarantee Facility of the Smart Finance for Smart Buildings initiative			2	2		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			2	2		
InvestEU			2	2		
RRF			2	2		
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			2	2		
European Green Deal, Fit for 55	1	1		1		

Source: EU Survey 2022.

Perspective

A characteristic of Lithuanian projects is the long payback period, shaped by the low energy prices and deficiency of investment. The situation may change in the upcoming period with the appearance of funding supported by the RRF,²⁶⁷ and the increasing energy prices, contributing to what surveyed experts defined as a slow take off of the public sector market.

Recommendations

To address the complexity and associated costs of applying to subsidy mechanisms a respondent to the EU Survey 2022 called for a greater focus on specific goals (savings) of support and information..²⁶⁸ The respondents also indicated a need of energy consumption data to be gathered and analysed to establish national priorities and support to mechanisms such as EnPC to ensure the attainment of energy efficiency and decarbonisation targets. These data and mechanisms need communication in Lithuanian for the clients, providers and financing actors to engage the market.

Based on the analysis of the information available it appears that the current development of examples and of the regulatory framework need to be accompanied with contractual and administrative developments in the treatment of EnPC as a type off PPP arrangements, and in grant application. A revision of energy pricing in non-residential uses, and the introduction of incentives to renovation (substituting investment grants by financing instruments) are needed for the investment in energy renovations to be cost-effective.

The following recommendations for EU institutions follow from the analysis presented:

²⁶⁷ VIPA energy efficiency fund. [New Funding Opportunities for Sustainable Energy Projects - Viešųjų investicijų plėtros agentūra \(vipa.lt\)](#)

²⁶⁸ The respondent considers that the multitude of requirements on the type of renovation and whether maintenance is included contributes to high costs of EnPC preparation. This recommendation was also gathered for the period 2018-19 (JRC 2021).

- Improved communication on the support mechanisms available, and continued promotion of financing instruments as opposed to investment grants;
 - Continued technical support for the development of simpler regulations and models for EnPC;
- Continued efforts to incentivise energy efficiency and decarbonisation e.g. carbon taxes.

18 The Netherlands

Comparison previous status

The JRC report of 2021 indicated that the Dutch public sector market was one of certain maturity but static or with slow development outside a few active municipalities. A major reason for limited activity was reported to be a preference for a diversity of alternative intervention models. However, the JRC 2021 reflected expectation on the development of national renovation strategies to overcome the reticence of decision-makers towards deep renovations and long contractual engagements. The supply of provision and facilitation services was reported as sufficient and of high quality.

The NECP paid attention to EnPC and highlighted that the adoption of the model was growing but was not widespread, the availability of examples from the central government; procurement guidelines, the facilitator pool trained by the GuarantEE project (H2020) and the collaboration of the government with the sector. The Plan also referred to a potential introduction of tax deductions for ESCOs,²⁶⁹ Subsidies were introduced through Kansen voor West and SDD++ but these did not specifically address ESCOs. The latter scheme, with a budget of €13b for 2022, has an emphasis on renewable energy and CO2 reduction.²⁷⁰

The LTRS only mentioned the availability of Green Lease for EnPC in private commercial rental to address split incentives. Risk-sharing mechanisms based on support of the National Heating Fund and National Energy Savings Fund are not tailored for EnPC and are not relevant to large companies. The Dutch LTRS demonstrates an overarching capacity to support energy performance projects, whether EnPC or other models, through intended development of centralized databases and data standardization, the formulation of a national roadmap for public buildings with a public function (e.g. object of Art. 5 of the EED), and the valuation of the sustainability credentials for rental premises. These advances have been positively appreciated in responses to the EU Survey 2022. However, these measures do not prioritise EnPC, and their impact on the adoption of the model is uncertain. Moreover, the government conducted a thorough review of national EnPC markets in 2020 (Van Kempen 2020, Hoevenagel 2020).

The RRP of the Netherlands and the Commission's review do not refer to EnPC.²⁷¹ According to the EU Survey 2022, most of the funds are being allocated to support residential renovations, and to support the electrification, which was ongoing prior to the 2022 crisis, as well as to help face increased costs of energy.

Current Status highlights

The market has remained stable in both the public and private sector. However, some providers have stopped offering EnPC services whilst no newcomers have been identified. Users of EnPC including the municipalities of Enschede, 's Hertogenbosch and Breda have started to use alternative model, and newcomers do not compensate for this loss (EU Survey 2022)

The most common types of projects involve DHC (2/3), and interventions in public buildings (1/3), smart grids (1/3). Interventions in buildings involve energy management and integral renovations (both rated 2/3 for both the public and private sectors). Are also of relative relevance maintenance, replacement of specific elements, installation of building control systems, on site renewable generation, storage capacity, M&V, and audits (all 1/3, in both the public and private sectors). Developments in the construction of new buildings and stricter regulations have contributed to an increase in heat cold storage as a solution. Service contracts including maintenance are becoming popular.

The table below summarizes the data gathered on market and contract sizes.

Table A 126. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
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²⁶⁹ There is no information on whether these deductions were implemented and their impact on the EnPC market.

²⁷⁰ [Stimulation of sustainable energy production and climate transition \(SDE++\) | RVO.nl](https://www.rvo.nl/en/energy/sustainable-energy-production-and-climate-transition/sde++)

²⁷¹ <https://www.rijksoverheid.nl/documenten/rapporten/2022/10/10/definitief-nederlands-herstel-en-veerkrachtplan>;
https://ec.europa.eu/info/files/staff-working-document-accompanying-proposal-council-implementing-decision-0_en;
https://ec.europa.eu/info/system/files/com_2022_469_1_en_0.pdf

Number of contracts	6	74	82	Own estimates based on data from 2019 ²⁷²
Overall size m€	5	60	65	Expert estimates based on 2019 data
Typical* size m€	1.2	1.2	1.2	
Typical* duration	10-15	10-15	10-15	
Typical* payback (yrs)	10-15	10-15	10-15	
Typical* % of baseline				No data available
Typical savings* MWh/year				No data available
Typical savings* m€/year				No data available

Source: EU Survey 2022.

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 127. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable	Stable	
Perspective 2022-2024	Slow take-off	Slow take-off	

Source: EU Survey 2022.

Status of the business environment

Few estimates on the availability and quality of services were obtained in the EU Survey 2022. These are indicated in the tables below.

Table A 128. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	40			No recent data available. Value for the public sector in JRC 2021
Facilitators	100			Dramatic increase respect to JRC 2021
One-stop-shops	12 (one in every province)			Municipal one-stop-shop created had no observable results
Financing actors willing to support EnPC	3			Banks and investment companies
Other				

Source: EU Survey 2022.

Table A 129. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	2	3	Limited capacity

²⁷² (Hoevenagel 2020)

				limits the market
Willingness	1	1	2	

Source: EU Survey 2022.

Contract modalities and alternatives

Based on the information collected in the EU Survey 2022, the use of EnPC with guaranteed savings and with shared savings are of limited relevance (rated 1/3) and similar to contract energy management, facility management, PPPs and ESCO-like support of municipalities (all rated 1/3). Energy efficiency improvement contracts are of relatively higher relevance (2/3). None of these alternative models nor new models being developed were reported as competing with EnPC. As of 2023 energy companies will be able to sign off-balance contracts with customers. These contracts are expected to gain a significant share of the market. It is still uncertain whether EnPC will have a role in this arrangement.

Table A 130. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)			1	
EnPC with shared savings (both parties share the savings, contractor take financial risk)			1	
Build-own-operate-transfer (BOOT)			0	
Contract energy management (chauffage)			1	
Facility management			1	
Consultancy and technical guarantee			0	
Energy efficiency improvement contracts			2	
PPPs			1	
Other			1	Local governments often provide financing and technical support to private owners

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets has been reported in the EU Survey 2022 as requiring improvement, especially in the development of guidelines, and the update of lists of operators, and demonstration projects (all of these rated 1/3). The use of EnPC in efforts to fulfil Art. 5 of the EED, the use of one-stop-shops, the availability of definitions and the availability of models for the private sector are better valued (2/3)

Table A 131. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2	Impuls EPC project	
EnPC Guidelines	1		
EnPC Model contracts public sector (whether off- or on-balance sheet)	1	Dutch Enterprise Agency's model contract	Organizations prefer to use their own contracts
EnPC Model contracts private sector	2		Financing can be problematic
Lists of EnPC qualified operators	1	Available	Rarely checked
One-stop-shops	2	In every province	lack of qualified personnel
Other information instruments			
EnPC demonstration projects	1	Projects from before 2022	Lack of continuation to demonstration projects
Obligation schemes /White Certificates			
Energy Audits			
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	2	Central Government Real Estate Agency gives example.	The example of the Central Government Real Estate Agency may not be reproducible by smaller public bodies (Scale, expertise)
Government rules and practices of procurement, contracting and tendering	2		

Source: EU Survey 2022.

Financing

No barriers have been identified about the combination of EU funds and EnPC. An opportunity in the Netherlands is the interest of banks to support EnPC projects. Some municipalities provide loans, mortgages and tax breaks to clients willing to improve the performance of their buildings.²⁷³ In principle these measures do not compete with EnPC but may result in lesser interest given that the financing aspect of the project is resolved.

Barriers

Municipalities are largely responsible for meeting the goals of the climate agreement but, according to the EU Survey 2022, they are understaffed. Municipalities and EnPC providers tend to lack qualified personnel. Moreover, the reception of supplies and administrative processes are slow. This is a problem for the development of EnPC markets and in general for the energy transition of the Netherlands.²⁷⁴ Limitations of technical capacity and risk avoidance are key barriers in the overall market, regardless of an increase in demand for energy efficiency and renewable generation. Due to availability of capital, and to reduce risks, clients tend to prefer better-known contracting modalities and to maintain ownership of the project (as also reported in JRC 2021). Moreover, preference for renewable generation and thermal storage observed in JRC 2021 and fostered by Government strategies seems to have resulted in priority being granted to other contract modalities and approaches to saving energy and climate neutrality. This is problematic because

²⁷³ See for instance: <https://www.amhemaan.nl/mogelijkheden/financiele-regelingen-woningeigenaren/>

²⁷⁴ [Record tightness in the labour market puts energy transition in jeopardy - ABN AMRO Bank](#)

tenders tend to preclude an integral approach which EnPC providers could supply. As of 2023 energy companies will be able to sign off-balance contracts with customers. These contracts are expected to gain a significant share of the market and will probably compete, not engage, with EnPC.

Eurostat treatment of EnPC

Changes and clarifications on the Eurostat treatment of EnPC in government accounts did not impact the EnPC market of the Netherlands (rated as 0 in scale -2,2). Besides limited relevance granted to the statistical treatment of these investments, the off-balance model contracts developed are considered to be insufficiently adapted to the context, and lack (by design) flexibility to address clients' needs (EU Survey 2022).

Drivers

The major driver identified in the EU Survey 2022 is the climate agreement for both the public and private sectors. CO2 prices are considered to be a major driver for a potential slow take off. In the period 2022-23, the price of gas is also a driver for the private sector. Moreover, there are new programs targeted to help municipalities to meet the goals of the climate agreement, and which might contribute to their engagement with EnPC. Real estate owners (private and business) can qualify for the Investment subsidy for sustainable energy and energy saving (ISDE) which is a National support mechanism for which are eligible solar panel projects, (hybrid) heat pumps, solar boilers, connection to heating networks, electric cooking facilities and certain insulation measures. The impact of this measure, as in the case of other public support (municipalities), on EnPC is uncertain. With a grant investment rate of around 20% the mechanism can be supportive to EnPC. This impact, however, has not been reported. The availability of regional one-stop-shops is also of relevance, but is unable to overcome overall demand for technical capacity of municipalities and shortage of qualified personnel to conduct specialized works for service suppliers.²⁷⁵ Collaborative initiatives have a potential for engaging actors in the model. The Impuls EnPC initiative (since 2019) has been developed in collaboration between Invest NL, BNG, RVO and PIANoo to provide guidelines to municipalities. However, it lacks follow up. Support from a one-stop-shop (Ontzorgingsprogramma) that works with small public building portfolios and small municipalities is having difficulties to create projects with sufficient scale.

EU support

The expert assessment of EU Support in the EU Survey 2022 provides limited insight on EU support mechanisms, The impact of the European Green Deal, Fit for 55, and NextGenerationEU package is supported by recognition that the decarbonisation drive promoted from EU institutions are a potential driver for the market.

Although Dutch research bodies are often involved in H2020 projects overseas, a lower number of these projects is directly tested or implemented in the Netherlands. One case of the latter type of project is GuarantEE- Energy Efficiency with Performance Guarantees in Private and Public Sector (1 April 2016 - 31 March 2019), which addressed split incentives and rigidity of contracts by developing new model contracts, market development in emerging markets through guidance and examples to municipal clients.

²⁷⁵ Previous coordinated efforts of Invest NL, BNG, RVO and PIANoo during 2017-19 drafted guidelines for municipalities but there was limited follow up, and a one-stop-shop (Ontzorgingsprogramma) for small public building portfolios and small municipalities but these continue to face barriers of scale.

Table A 132. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			0			
Guarantee Facility of the Smart Finance for Smart Buildings initiative			0			
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			0			
InvestEU			0			
RRF			0			
De-Risking Efficiency Platform (DEEP) and EFIG Underwriting Toolkit			0			
European Green Deal, Fit for 55			1.5			

Source: EU Survey 2022.

Perspective

The market seems to continue a slow trend, shaped by risk awareness, as depicted in 2020 (Van Kempen 2020). There are expectations for a small take off resulting from demand for energy conservation projects and limitations in the supply side. As of 2026, heat pumps may become mandatory which may be an opportunity for EnPC, amongst other models. New standards (MEPS) resulting from the implementation of the Renovation Wave are expected increase the depth of renovations but for the time being is creating uncertainty.

Recommendations

To overcome the slowing of the market and foster its take off, technical capacity development in municipalities, along with regulatory connexions between energy saving, climate targets and the use of guarantees for integral interventions appear to be the most pressing actions to be taken for municipalities to engage with EnPC.²⁷⁶ Currently, there is a potential for adapting the current off-balance contract model to engage with client's needs and decarbonisation goals.

National reporting on the adoption of energy services are interesting to support policy-decisions. However, these reports show the lack of a database of EnPC projects which would serve to exchange experiences, and which could be key to overcome remaining barriers of trust and preference for simpler models. This sort of database could feed into an EU-level database, also recommended for other MS. A continuation of Impuls EnPC and efforts to aggregate projects may benefit of technical support or exchange of experiences in other MS where small projects have been successfully aggregated. This sort of support needs to be tailored to the needs of municipalities, some of which have stopped using the model. The existence of a network of regional one-stop-shops, Impuls EnPC and Ontzorgingsprogramma are an opportunity for Technical support to be impactful. Technical support could also serve to develop contracts able to address more integrally clients' needs and decarbonisation goals.

Good practices

A good practice highlighted throughout the Whitepaper of RVO on best practices for ESCO projects is the importance of collaborative engagement between the actors, their long partnerships and the development of

²⁷⁶ Previous expectations in the JRC 2021 for the development of national renovation strategies (Art. 2a) to help overcome the reticence of decision-makers, and increased emphasis on deep renovations and life cycle considerations are still valid in the current context.

trust based on contractual agreements that can be adjusted, and which focus on achievements (and deadlines), not so much the technological improvements.²⁷⁷

²⁷⁷ [1598877102whitepaper 4 - best practices and inspiration on esco projects in the netherlands.pdf \(rvo.nl\)](#)

19 Poland

Comparison previous status

The JRC reported in 2021 that about 13 projects had taken place in the period 2018-2019, with a volume of €39m in the public sector only. Considering the market potential, Poland was categorized as a “small, emerging” EnPC market.

Current Status highlights

The public sector has remained stable, and the private sector has a marked upward trend, largely driven by RES developments.²⁷⁸ During the 2019-21 period a total of 40 projects were reported, 15 of which were in the public sector, with a total volume of some €100m.

There is a prevalence of EnPC with guaranteed savings over shared savings driven by client preferences. Projects in the public sector can be treated under the PPP and the Energy Efficiency Act of 2021. The former benefit of simplified rules of the PPP law, and are expected to function as reference projects.²⁷⁹

According to experts participating in the EU Survey 2022, the most common intervention sites are commercial buildings both in the public (schools, hospitals) and private sector, public lighting – which has started to gain relevance, especially in medium sized cities – , and industrial installations (energy sources, electrical engines, compressors) and renewable installations in the private sector (all rated 2/3) have a large potential in Poland. Projects for smart grids are being planned. A DHC project has been reported in Warsaw to have been implemented in 2020, as having attained 12% savings for 1000 apartments.²⁸⁰ Project bundles are relatively rare (1/3). In public buildings, the main types of interventions covered are energy management and installation of control mechanisms (2/3).

Wall and window interventions are often part of public sector projects, resulting in these being costlier than private sector projects. These projects tend to last more than 10 years, have a payback of 15-20 years and typical savings of 50%. However, a financing model to support these integral seems not to have consolidated, due to difficulty to combine grants with EnPC financing (e.g. through forfeiting, or private financing institutions), and the interest of municipalities for off-balance solutions. In private buildings, the main interventions highlighted are renewable installations (2/3), which have gained relevance in the last years. Interventions in industrial sites, on processes and renewable generation, are also important in the private sector.

The tables below summarize the data gathered on market size, contract sizes, and market trends.

278 The volume is similar to the one reported for the public sector in 2018-2019, and well above the one reported in 2016-2017 for the overall market (JRC 2021, 2017).

279 These projects are supported and registered by the Ministry of Funds and Regional Policy - Central Unit for Private-Public Partnership (<https://www.ppp.gov.pl/about-the-ministry-in-ppp/>).

280 Valérie Plainemaison, EFIEES. Harnessing the potential of energy management and district heating in REPowerEU. Frankfurt 2022

Table A 133. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	15	25	40	The Covid resulted in less contracts
Overall size m€			100	
Typical* size m€	1	0.25		public projects are bigger because they often include wall insulation and windows
Typical* duration	10+	5		Interest rates can push the contract period to 3-10 years instead of 5-15
Typical* payback	15-20			
Typical* % of baseline	50	80+		Projects in private buildings refer mainly to renewables
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022 and projects reported by Effect4Buildings.

Table A 134. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable (the market size has remained similar to the previous period)	Upward (the market size has increased compared to the previous period)	Private (industry) influenced by rising energy prices, Public sector affected by Covid
Perspective 2022-2024	Upward (the market size has increased compared to the previous period)	Upward (the market size has increased compared to the previous period)	Customers concerned about high prices, interested in saving energy

Source: EU Survey 2022.

Status of the business environment

Expert review of the market actors indicates insufficient services of provision, facilitation and financing, as well as a potential for development of One-stop shops. The public sector appears to be the best acquainted and willing to work with EnPC (2/3). The knowledge and willingness to operate with EnPC of the private sector is limited, with the exception of industry. The financing sector is also considered limited in terms of knowledge and willingness to support EnPC. The interest of the public and private sector, however, is influenced by the distribution of project development costs. These are borne by the provider in public ESCO projects, even in cases when the project is not implemented – as is often the case. As a result, public projects tend to develop when providers promote them. On the contrary, the private sector is more thoughtful when commissioning a project preparation because the client bears these costs. As a result, providers also prioritize private projects.

The tables below summarize the availability of services and the willingness of actors to engage the market.

Table A 135. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	50	0		Number based on list of the MoD
Facilitators	10	1	2	
One-stop-shops	2	0	1	
Financing actors willing to support EnPC	5	0	1	
Other				

Source: EU Survey 2022.

Table A 136. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	2 for local governments (0 for central government)	2	1	
Willingness	2 for local governments (0 for central government)	2	1	

Source: EU Survey 2022.

Contract modalities and alternatives

The main EnPC modality is guaranteed savings – driven by client preferences – but shared savings modalities are currently being promoted by the sector as a way to attract providers.

The major models coexisting with EnPC are facility management and energy efficiency improvement contracts. These may compete with EnPC. On the other hand, PPP operates as a type of EnPC or it has relative relevance in public buildings. There is also a development of financing models, promoted from private financing institutions, with support of public funds, and which may compete with EnPC in the residential sector.

Table A 137. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	2	2		Preferred by customers
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	1		Facilitators are proposing this model
Build-own-operate-transfer (BOOT)			1	
Contract energy management (chauffage)	1	0		
Facility management	2	2		
Consultancy and technical guarantee			1	
Energy efficiency improvement contracts	2	2		

PPPs	2			Not competing, it is the legal framework for EnPC in public sector. Simpler solutions expected
Other				

Source: EU Survey 2022.

Regulatory framework

The implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, received a relative approval from experts consulted in the EU Survey 2022. The maximum grade granted was 2/3 for definitions, model contracts for the public sector, obligation schemes and energy audits. There is still a need for a list of qualified EnPC operators, One-stop-shops (expected in development), and a large potential for the use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings) (all of them graded 0/3). Amongst the best practices indicated is the use of PPP models, under which multiple EnPC projects are being contracted in the public sector.

From 22 May 2021, the provisions of the Act of 20 April 2021 amending the Energy Efficiency Act and other acts which implement Directive (EU) 2018/2002 entered into force. The aim of the act is to adapt Polish law to the solutions provided for in the directive amended in 2018, for Poland to meet its targets. The proposed act specifies in which situations EPC agreements will not have an impact on increasing the level of public debt, thus the draft law implements Eurostat guidelines in this respect. This will remove one of the main barriers to the use of energy efficiency contracts in Poland.²⁸¹

²⁸¹ <https://www.gov.pl/web/klimat/efektywnosc-energetyczna>

Table A 138. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2	Energy Efficiency Act	
EnPC Guidelines	1	EnPC guidelines expected beginning of 2023	
EnPC Model contracts public sector (whether off- or on-balance sheet)	2	Refers to the PPP model (off-balance). A non-PPP model is in plans	
EnPC Model contracts private sector	1	Adaptation of previous contracts	
Lists of EnPC qualified operators	0		
One-stop-shops	0	Private banks are getting involved	
Other information instruments	1		
EnPC demonstration projects	1	Good experiences with housing cooperatives and industry	Need additional communication of demonstrative function
Obligation schemes /White Certificates	2	Often requested in contracts	
Energy Audits	1	periodical for industry and buildings	Variable quality, not used for EnPC
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		
Government rules and practices of procurement, contracting and tendering	1	PPP Act, Energy Efficiency Act	Guidance is needed

Source: EU Survey 2022.

Financing

Although, as reviewed, the interest and knowledge of financing bodies is considered limited by consulted experts (EU Survey 2022), there is a wide variety of financing options from client and provider funds, as well as from private and public financing sources. However, financing cost are high and, as argued in JRC 2021, grants are of limited relevance (1/3), in part due to difficulties to combine ERDF grants with public financial instruments. Forfeiting is of sizeable relevance (2/3) but its presence in public projects results in the EnPC being treated as on-balance. A pilot support scheme for combining grants and forfeiting in multi-apartment buildings (EPC+) has not yet achieved the expected impact and may require simplification and adjustment of the grant ratio to engage the market complex, grant rate is lower than for traditional procurement.²⁸²

²⁸² [The first call for applications for the Priority Programme has been launched in Poland - FinEERGo Dom; PL-MF-AnnualReport-2021.pdf \(modernisationfund.eu\)](#)

Table A 139. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	2	2		
Provider funds	1	2		
Third-party Public funds	2	1		
Third party Private funds	2	2		
Private financing inst.			3	
Public financing inst.			3	
Debt financing			1	
Guarantees and guarantee funds			0	There is progress, expected results by mid-2023
Equity financing			0	
Mezzanine financing			0	
Project financing			1	
Leasing			1	
Special Purpose Vehicles			1	
Grants			1	Difficult to combine ERDF grants with government instruments
Forfeiting			2	Problematic for off-balance treatment
Other				

Source: EU Survey 2022.

Barriers

In general, contained growth in the period 2020-21 was driven by moderate energy prices and an increase in service prices. The main barriers reported by experts for the public sector are the Covid pandemic and issues of combining public and private financing whilst recognizing providers' profit margins (EU Survey 2022).²⁸³ This is problematic in a context where EnPC, especially in multi-apartment buildings, has difficulties to compete with grant-funded retrofits. The latter is expected to stay and limit, alongside uncertainties about material and financing costs, the growth of EnPC the public sector. In the private sector, the major barriers in 2020-21 were the uncertainties created by regulations on gas cogeneration, and delayed implementation of EU regulations, e.g. on energy obligations. There is a risk that in 2022-2024, private clients may focus on their core activities more than on saving energy. EnPC providers are concerned that their economic profit needs to be recognized in EnPC contract models.

Drivers

In the period 2022-24 the expected growth driven by rising energy prices. A possible adoption of renewable projects in the public sector may be also a driver for EnPC or result in the use of other models. Providers' promotion of services through free consultancy is a driver for the development of local projects but may come at the cost of adequate tendering processes. Demand for off-balance sheet options from municipalities, which have limited access to financing, is expected to continue growing. Both the regulatory and financing context is also expected to push the market. The National Infrastructure, Climate and Environment Programme is required to support the ESCO market and EnPC. New engagement from the banking sector is foreseen to nurture the market.

²⁸³ It has been argued that more transparent tendering processes and tendering of preliminary studies would help level play competition, enabling an increased supply and interest for EnPC at local level.

Eurostat treatment of EnPC

According to experts consulted in the EU Survey 2022, the Eurostat Guidance had a limited impact on the approach of the public sector to EnPC (1/3). Whilst off-balance model contracts have been produced satisfactorily, yet their use is moderate (20% of public sector contracts). Municipalities are very much in need of such off-balance treatment. The combination of forfeiting and of grants with these models remains problematic.

EU support

The only positively appraised EU support instruments are technical support and the driving effect of the European Green Deal, Fit for 55 and NextGenerationEU. Issues of size and difficulty to pool projects is reported as a barrier for the use of technical assistance. Importantly, there are no incompatibilities between EU funding and EnPC financing but combining them has been unsuccessful. Moreover, grants compete with EnPC making it less attractive, especially in multi-family buildings.

Table A 140. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			1		Minimum size and need of pooling projects	
Guarantee Facility of the Smart Finance for Smart Buildings initiative			0			
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			0			
InvestEU			0			
RRF			0			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit			0			
European Green Deal, Fit for 55	1	0	1			

Source: EU Survey 2022.

Perspective

Growing markets are expected in both the public and private sector, largely driven by energy prices and recovery of activity in the public sector after COVID. The experts consulted foresee a potential in a greater (policy and sectoral) focus on EnPC projects and for some companies including efficiency and renewable installers, and constructors to start activity in EnPC. There are expectations on contract models to be simplified and shortened and, and instruments for price valorisation be included after the adoption of new EnPC guidelines in 2023. Development of residential contracts is expected: With the support of FinEERGoDom, EnPC+ is being promoted, and there are currently residential projects under negotiation as a part of a program that prioritizes EnPC in the residential sector.²⁸⁴ From 2023, the NFOŚiGW EPC+ Programme will be developed in public buildings both of national bodies and municipalities.

Recommendations

Experts identified a potential for EU support mechanisms addressed to building competences in financing institutions. Polish financial institutions receive support under the Green Gateway (EIB and InvestEU) but not specifically on EnPC or ESCOs.²⁸⁵ Efforts to lower the cost of financing would serve to reduce payback periods (in JRC 2021, a demand for cohesion fund support to guarantee funds was identified), alongside rising

²⁸⁴ The first call for applications for the Priority Programme has been launched in Poland - FinEERGo Dom.

²⁸⁵ [Green Gateway – Greening Financial Systems Technical Assistance Programme \(eib.org\)](#)

energy prices. This would be important to foster deeper renovations. The full development of Art. 18 and Art.5 of the EED would largely further the potential for the EnPC the model. In particular, implementation of Art. 18 should ensure that M&V is adequately integrated in projects and that there are mechanisms for bearing the costs of project development in the public sector, the provision of guidance about the application of the Energy Efficiency and the PPP acts, as well as on the combination of ERDF with public financial instruments. These developments could take place as a part of the National Infrastructure, Climate and Environment Programme is required to support the ESCO market and EnPC.

Good practices

The Polish market seems to be collecting the fruits of previous projects that showed the possibility for bundling and large-scale operation involving the modernisation of buildings and increased comfort. Projects in DHC may be taking off and are a source of expectation for the achievement of energy saving and carbon neutrality targets.²⁸⁶ The potential in the industry has been also highlighted by market players. However, the potential of buildings needs not to be left aside, as it is mostly unexplored.

²⁸⁶ Alex Geers 2022, EFIEES. EnPCs: Key for delivering on Europe's climate targets. Frankfurt 2022; Valérie Plainemaison, 2022. EFIEES. Harnessing the potential of energy management and district heating in REPowerEU. Frankfurt 2022

20 Portugal

Comparison previous status

Previous JRC reports found difficulties to estimate the size of the Portuguese EnPC markets. The JRC report of 2021 found a sizeable public market leading the use of EnPC, and was estimated around €50m for 2019-20, with most activity in public lighting. The market had rapidly grown compared to previous data (JRC 2017, 2019; Lanhenke 2018) projected to suffer some degree of stagnation. In 2021, relatively large projects were common (€5.3m), largely driven by project aggregation supported through Technical Assistance Elena. Renewables were expected to increasingly be included in these project pools.

Whilst the NECP did not refer to EnPC, the LTRS planned a series of actions to promote EnPC in public buildings, including the development of off-balance EnPC, municipal and regional one-stop-shops for advice and finance.²⁸⁷ Strengthening of inter-ministerial collaboration, and training of local energy managers were also potential opportunities for EnPC in the LTRS. However, the RRP does not mention EnPC nor ESCOs, and the EC review highlighted procurement rules as problematic for public buildings' renovation.²⁸⁸

Current Status highlights

Based on the EU Survey 2022, a downward trend and a stable market have been identified for the period 2020-21 in the public sector and the private sector, respectively. There is however limited data to estimate the market size and the availability of services. Public projects are restricted to public lighting, have budgets around €5m and last 10 to 12 years.²⁸⁹ Private projects are more variable, between €1m and €5m and reported to last around 6 years. However, there is reported uncertainty on the extent these projects can be categorized as EnPC. These projects are not collected in any public database.

The table below summarizes the data gathered on market and contract sizes.

Table A 141. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	5			
Overall size m€	50			
Typical* size m€	5	1-5		Public projects refer t street lighting
Typical* duration	10-12	6		
Typical* payback (yrs)	6-8	4		
Typical* % of baseline	70	30		
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

²⁸⁷ There was also a plan – never implemented – to channel EIB-supported investment (IFE 2020) as an alternative to subsidies

²⁸⁸ [EUR-Lex - 52021SC0146 - EN - EUR-Lex \(europa.eu\)](#)

²⁸⁹ These project sizes are smaller than in the past, when large lighting projects aggregated multiple municipalities.

Table A 142. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Downward	Stable	Covid impact and changes in the ESCO contract for public entities (ECO.AP 2030 is missing regulation)
Perspective 2022-2024	Slow take-off	Slow take-off	

Source: EU Survey 2022.

As in the previous report (JRC 2021), the most common types of interventions are street lighting (2/3), industry (2/3) and renovations in private buildings (1/3). Building projects – in the private sector only – involve installation of renewables, audits (both 3/3), replacement of specific elements, maintenance (2/3), installation of control systems, monitoring and verification, and energy management (all of them rated 1/3). Public lighting projects tend to include maintenance.

Status of the business environment

The availability of services could not be assessed due to data limitations. The sufficiency of and quality of services of provision and facilitation) reported in the EU Survey 2022 indicates a relatively sufficient availability of services (2/3 for provision, and 3/3 for facilitation) and quality (2/2 for providers and facilitators). There are no reported one stop shop services. And the availability of financing actors willing to support EnPC is limited (1/3) but when available of relatively high quality (2/3). More understanding of the model and willingness to engage with it would be desirable for clients and financiers (all 1/3, except for the public clients' understanding, rated 0/3).

Table A 143. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	30	2	2	Qualification system for EnPC and official list available
Facilitators	5	3	2	Energy agencies have a facilitation function but limited in capacity
One-stop-shops	0	0	0	
Financing actors willing to support EnPC		1	2	
Other				

Source: EU Survey 2022.

Table A 144. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	0	1	1	
Willingness	1	1	1	

Source: EU Survey 2022.

Contract modalities and alternatives

The EU Survey 2022 indicates that the EnPC models is of relative relevance in the public (shared savings models rated as 2/2) and private sectors (both shared and guaranteed savings models are rated as 2/2). Private contracts tend to be hybrid in including EnPC principles and aspects of other models. Regulatory issues are considered more problematic barriers than competition with alternative contracting modalities.

Table A 145. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 =uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	2		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	2	2		
Build-own-operate-transfer (BOOT)	0	2		
Contract energy management (chauffage)	0	1		
Facility management	2	3		
Consultancy and technical guarantee	0	1		
Energy efficiency improvement contracts	0	1		
PPPs	1	0		
Other				

Source: EU Survey 2022.

Regulatory framework

The implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets is reported in the EU Survey 2022 as deficient in the domain of model contracts, especially in the public sector (which are not included in the new Resource Efficiency Program in Public Administration (ECO. AP 2030), and the availability of demonstration projects. EnPCs are not supported through the implementation of Art. 5 of the EED on the exemplary role of the public sector, nor through EEOs/ WhCs.²⁹⁰

²⁹⁰ Previous expectations (JRC 2021) for the use of EnPC as required in the Portuguese implementation of Art. 5 of the EED have not materialized.

Table A 146. Experts' perception of the MS's implementation of the EU regulatory framework.

Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2		
EnPC Guidelines	1		
EnPC Model contracts public sector (whether off- or on-balance sheet)	0	Contract for buildings published in 2022 ²⁹¹	
EnPC Model contracts private sector	1		
Lists of EnPC qualified operators	2		
One-stop-shops	0		
Other information instruments	1		
EnPC demonstration projects	0		
Obligation schemes /White Certificates	0		
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		
Government rules and practices of procurement, contracting and tendering	1	Public lighting	Several barriers for buildings ²⁹²

Source: EU Survey 2022.

Financing

In the public sector, clients funds (1/3) and other public funds (3/3) (does this refer to national grants?) are the financing sources used. Grants cannot be used for EnPC but are used for other types of contracts, and hence constitute a barrier to EnPC. In the private sector, client funds and provider funds are often used, most commonly receiving private funding (all of them 2/3), and occasionally public funding (1/3).

²⁹¹ Ordinance 671/2022, from 9 September [Portaria n.º 671/2022, de 9 de setembro | DRE.](#)

²⁹² [Regulatory Barriers for Energy Service Companies. Perspectives Based on Feedback from National ESCO Associations - Copenhagen Centre on Energy Efficiency \(unepccc.org\)](#)

Table A 147. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1	2		
Provider funds	3	2		
Third-party Public funds	0	1		Grants are used for non-EnPC contracts
Third party Private funds	3	2		
Private financing inst.				
Public financing inst.				
Debt financing				
Guarantees and guarantee funds				
Equity financing				
Mezzanine financing				
Project financing				
Leasing				
Special Purpose Vehicles				
Grants				
Forfeiting	1			Tested and replicated in EEEF projects of public lighting
Other				

Source: EU Survey 2022.

Barriers

Based on the information collected in the EU Survey 2022, the public sector markets have been largely affected by Covid and changes in the ESCO contract for public entities. Contracting with the public sector involves too high risks and costs for providers. The legislative framework has also been an obstacle for the private sector to develop to its potential, and as a result has remained stable in the period 2020-21. Moreover, combining EU Funds with EnPC is not possible. Legislative barriers are expected to continue to be problematic in the public buildings and in the private sector.²⁹³ Moreover, the model is insufficiently known for buildings, which tend to have low energy intensity in Portugal and hence are not attractive for investment in performance. A new law for contracting interventions in public buildings has been passed in 2022. The response of the market is still uncertain.

Eurostat treatment of EnPC

In the past a sizeable impact of uncertainty about the statistical treatment of EnPC in government accounts were reported as significant (Liviu et al 2015, JRC 2021) changes and clarifications on the **Eurostat treatment of EnPC** in government accounts has not been reported (rated impact 0 in a scale of -2, 2). Although the model contract used during the report period is considered to be off-balance by respondents (100% of use) the national statistic authority has not recognized it as such. Contract updates are demanded by the sector for providers to be interested in pursuing contracts with the public sector (EU Survey 2022).

Drivers

The major drivers identified in the EU Survey 2022 for the 2020-21 have been the interest of clients in ESCO financing and the use of EnPC financing without effect on the debt status of infra-national public authorities. These drivers are expected to continue to be of relevance in the period 2022-23.

²⁹³ [Regulatory Barriers for Energy Service Companies. Perspectives Based on Feedback from National ESCO Associations - Copenhagen Centre on Energy Efficiency \(unepccc.org\)](#)

EU support

The expert assessment of EU Support in the EU Survey 2022 recognizes some value to technical assistance in the public sector (rated 1 in a scale of -2,2).²⁹⁴ It describes the rest of mechanisms as irrelevant or having a negative effect. The most fundamental problem highlighted is that funding mechanisms cannot be combined with EnPC. Homogenisation in this domain is demanded by sectoral experts. In the current situation the EU mechanisms of the Green Deal, Fit for 55 and NextGenerationEU are counterproductive for EnPC (rated -1 in the scale of -2,2 for clients and financing actors).

Table A 148. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	1	0		0		
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0		1		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	-1	-1			Cannot be combined with EnPC	
InvestEU	-1	-1			Cannot be combined with EnPC	
RRF	-1	-1			Cannot be combined with EnPC	
De-Risking Efficiency Platform (DEEP) and EFIG Underwriting Toolkit						
European Green Deal, Fit for 55	-1	-1		-1		

Source: EU Survey 2022.

Perspective

Increased introduction of Artificial intelligence and Building Management Systems, and overall, a slow take off of public and private sectors is expected in the period 2022-23 (EU Survey 2022).

Recommendations

There is a need of regulatory update, particularly to develop EnPC markets in public buildings, and to development of a framework that enables the combination of EU support (included those from the RRP) and EnPC. The existence of financing capacity for refinancing in public lighting could be of use to enable long term financing for the renovation of (public) buildings. Continued support through ELENA is advisable to expand the scope of public projects to buildings and lead the development of a private market.

Good practice

There are positive experiences with the aggregation of public lighting projects with use of forfeiting, developed with support of the EEEF in 2018. The use this forfeiting mechanism has been replicated in projects developed in 2021.²⁹⁵

²⁹⁴ A few Horizon projects have been supportive in the development of insurance mechanisms and turn key mechanisms for SMEs (ESI Europe, 2018-22), dissemination of the EnPC model (AmBIENCE, 2019-22). BuildUP (2018-21) worked on public procurement barriers to ENPC, the inclusion of RES, bundling projects and developing trust.

²⁹⁵ [The European Energy Efficiency Fund European ESCO Conference 2022 Presenter: Rahul Pratap Singh Date: 05 Oct 2022.](#)

21 Romania

Comparison previous status

The JRC reports of 2021 and 2017 indicated that there was absence of activity in the public sector markets and the overall market, respectively. However, there have been a number of providers able to work on EnPC, as reported in JRC 2017 (less than 10) and JRC 2021 (around 4).²⁹⁶

Based on government reports and the EU Survey 2022 there has been a government intend to develop and regulate the EnPC market. The NECP mentioned the creation of a working group on the barriers to EnPC in public sector and a focus on public lighting first, previous to implementing projects in public buildings. The NECP and the LTRS reported the existence of a problematic legislative framework and procurement rules, low energy prices, limitations of funding (competing grants), high perception of risk and high mistrust in the market related to the absence of standardisation, and M&V mechanisms. The LTRS planned an assessment of PPP and EnPC models for public building renovation, as a part of harmonization efforts with Eurostat guidance. The LTRS included calls for the use of EnPC in district heating renovation – which is a requirement for residential funding – the use of incentives in public buildings, along with changes in the regulatory framework. However, regulatory changes and proposals have been perceived as largely inadequate by ESCOs. The availability of grants and loan and grant combinations for renovation of all type of buildings, also highlighted in the LTRS, appears to be another key barrier that disactivates initiatives to develop the EnPC model. This assessment coincides with that of the WB in 2022.²⁹⁷

The RRP does not mention ESCo models nor EnPC in particular. Recommendations for the implementation of the RRP include to “leverage private finance and develop more market-based mechanisms (incl. EnPC)”, alongside development of a long-term financing strategy, training efforts, technical assistance to municipalities and one-stop-shops (Renovate 2022).²⁹⁸ Independent reviewers are also harsh on the Romanian RRP for the limited engagement of EnPC and limited commitment to achieving decarbonisation goals.²⁹⁹ The most appreciated mechanism is the creation of a loan portfolio guarantee and a fund of funds for energy renovation.³⁰⁰

Current Status highlights

The expert input gathered in the EU Survey 2022 shows that there were no EnPC projects during the reported period 2020-21. However, EnPC in its modality of guaranteed savings has a potential in the private sector (rated 3/3), and there is an ongoing take off in this market which has not yet resulted in consolidated contracts. Public sector and guaranteed savings models were assessed to be irrelevant (both were rated as 0/3). For the period of 2022-23, the market is expected to remain stable, i.e. with no projects in the public sector and a small market in the private sector. Maintenance, replacement of specific elements and integral renovations (design and works contracts) are the most common projects in the private sector. In general, there is an absence of data about EnPC contracts having been signed in the study period. According to the EU Survey 2022, there may be projects being concluded in the private sector, but it is uncertain whether these involve energy performance guarantees and correspond to the EnPC model.³⁰¹

²⁹⁶ According to the EU Survey 2022, the latter value is current.

²⁹⁷ “After a temporary rise in the market triggered by the adopted new strategic policies for the ESCO sector, donor and IFI support, the market went down due to ample grant financing for public sector EE projects, limited legal incentives, and ambiguities in the legislative framework, combined with the limitations of the banking system, which hampered the ESCO development.” (WB and EC 2022. Diagnostic Assessment Report: Romania. Technical Assistance Facility to Support the Renovation Wave in EU Member States

²⁹⁸ Renovate2Recover_Full-Study-1.pdf (renovate-europe.eu)

²⁹⁹ See for instance: 2021-04-26_Romania-RRF-assessment_final.pdf (bankwatch.org)

³⁰⁰ epg-green-recovery-policy-brief-24-nov-1.pdf (europeanclimate.org)

³⁰¹ The most active project typologies are facility management in the private sector but without inclusion of energy efficiency targets. There is activity in DHC and public lighting with the participation of ESCOs but these contracts do not seem to involve EnPC or fail to take off (Elsaco refers some examples of ESCO activity in DHC <https://en.elsaco.com/projects/completed-projects/case-studies/>). There is also the work of major energy supply players in the domain of smart grids, and there is energy efficiency investment in industry, but these projects are not reported to involve EnPC.

The table below summarizes the data gathered on market and contract sizes.

Table A 149. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	0	0	0	Lack of certainty in the public sector due to regulatory barriers. Private sector data does not prove existence of EnPC
Overall size m€			0	
Typical* size m€				
Typical* duration				
Typical* payback (yrs)				
Typical* % of baseline				
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

Table A 150. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Did not take off	Did not take off	Some experts refer to a take off in the private sector. This could refer to a lax understanding of EnPC without upfront payments and guarantees
Perspective 2022-2024	Stable	Slow take off	No expectations because the national RRP lacks provisions for EnPC. Uncertainty about new EnPC rules

Source: EU Survey 2022.

Status of the business environment

The sufficiency of and quality of services of provision is high but countered by a financial and legal framework that impedes these actors to conduct EnPCs, and unclear understanding of what this model involves. There is no facilitation services in place, nor One stop shops working with energy efficiency. Only private clients have some degree of willingness and understanding of operating with EnPC (both rated as 1/3) The financing sector states its interest seem to be quite acquainted with the model (rated as 2/3) but is currently incapable of integrating energy performance in its activities.

Table A 151. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	3-4	3	3	There are actors able to conduct EnPC but lack of demand, financing and legislation impedes these contracts
Facilitators	0			Some private initiative may develop facilitation capacity
One-stop-shops	0			Taking off in buildings but not focused on energy consumption
Financing actors willing to support EnPC	1	0	1	Stated willingness is not matched with capacity to overcome sectoral and regulatory barriers
Other				

Source: EU Survey 2022.

Table A 152. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	0	1	2	There is uncertainty about the understanding and interest of banks in accepting energy savings as collateral
Willingness	0	1	2	Stated willingness is not matched with the capacity to overcome sectoral and regulatory barriers

Source: EU Survey 2022.

Contract modalities and alternatives

Many contract models are available based on the information collected in the EU Survey 2022. Of these, the most relevant ones are Contract Energy management, Consultancy and technical guarantee and energy efficiency contracts, and Facility Management in the public sector. These alternative models are considered mainly complementary, not competing with EnPC, and have limited weight in the energy efficiency market. For the consulted experts, the main competing mechanism is the direct investment of grant funds in the public sector.

Table A 153. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	0	0		Expert concerns about private arrangements correspond to a lax understanding of EnPC. Others claim the existence of certain activities. There is a major potential for guaranteed savings in the private sector.
EnPC with shared savings (both parties share the savings, contractor take financial risk)	0	0		
Build-own-operate-transfer (BOOT)	0	1		
Contract energy management (chauffage)			2	
Facility management	1	2		
Consultancy and technical guarantee			2	
Energy efficiency improvement contracts			2	
PPPs			1	
Other				

Source: EU Survey 2022.

Regulatory framework

The implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets has been assessed in the EU Survey 2022 as very limited (receiving ratings mainly of 0 and 1 out of 3), besides energy audits which are considered highly adequate (3/3). As reviewed by the WB and the EC (2022), there is a problematic jurisdiction of the Ministry of Energy without attributions on buildings over energy services and an overall lack of transposition of rt. 18 of the EED. This includes issues with the definition and EnPC's lack of a list of accredited ESCOs. These standard contracts do not refer to M&V and mismatches in the legislation governing the procurement process, the rules governing the budgetary allocations, and the statistical treatment of the energy performance contracts and accounting as debt.³⁰²

³⁰² The World Bank. 2022. Diagnostic Assessment Report. Technical Assistance Facility to Support the Renovation Wave in EU Member States.

Table A 154. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	1		Multiple
EnPC Guidelines	1		Not officially transposed in any regulatory act or norm.
EnPC Model contracts public sector (whether off- or on-balance sheet)	1	Off-Balance contract drafted, being discussed with sector	Contract does not include M&V
EnPC Model contracts private sector	0		Multiple
Lists of EnPC qualified operators	1	ANRE official list	No accreditation or certification
One-stop-shops	0		
Other information instruments	0		
EnPC demonstration projects	0		
Obligation schemes /White Certificates	0		
Energy Audits	3		No barriers
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	0		Multiple
Government rules and practices of procurement, contracting and tendering	0		Multiple, the Ministry of energy has the attributions on EnPC (not on buildings)

Source: EU Survey 2022.

Financing

No barriers have been identified to the combination of EU funds and EnPC. However, the widespread use of grants in energy efficiency investment could be channelled through guarantees and guarantee funds to support EnPC projects (EU Survey 2022). Grants are the most accessible financing mechanism and the one that is considered to compete with EnPC potentially. These are provided by various financial instruments of the EC, IFI and by the Romanian Government.

Table A 155. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds			3	
Provider funds			1	
Third-party Public funds			3	
Third-party Private funds			2	
Private financing inst.			2	
Public financing inst.			3	
Debt financing			1	
Guarantees and guarantee funds			1	
Equity financing			1	
Mezzanine financing			1	
Project financing			1	
Leasing			2	
Special Purpose Vehicles			2	
Grants			3	
Forfeiting			1	
Other				

Source: EU Survey 2022.

Barriers

The major barrier highlighted by experts in the EU Survey 2022 is the limited government commitment to EnPC in previous years and the lack of expectations for this to change. Although there are actors able to conduct EnPC, the lack of demand and financing and the problematic legislation impede these contracts. ESCOs are not motivated to engage with EnPC because the legal framework is inadequate, and some funds allow ESCOs to carry out a profitable activity with other models. Attempts to develop DHC at the municipal level have encountered barriers of a lack of local capacities, procurement rules and a lack of efficiency and carbon neutrality targets involving these actors. As found by the WB, there is no mandate nor incentive for public buildings (“which are commonly the easy target for energy performance contracting in other countries in the region”) to implement energy-saving interventions, and 100% grants cover these, there is lack of awareness amongst potential clients and an overall lack of tailor-made financial products for ESCOs (2022).³⁰³

Eurostat treatment of EnPC

Changes and clarifications on the **Eurostat treatment of EnPC** in government accounts greatly impacted the development of EnPC markets (rated 2 on the scale of -2,2). An off-balance contract was developed in 2022 but has not yet been adopted by the sector. No other budgetary rules are considered problematic – in Romania, the balance sheet treatment matters at the national level and not at the local level because the Local finance act states that loans used to co-finance EU grants do not count toward the budgetary limits.

Drivers

The experts responding to the EU Survey 2022 indicated an absence of drivers both for the periods 2020-21 and 2022-23. There have been dynamics towards developing off-balance contracting in response to the RRP. However, the information collected is contradictory, with most reviewers demanding greater attention being paid to the EnPC model.³⁰⁴

³⁰³ The World Bank. 2022. Diagnostic Assessment Report. Technical Assistance Facility to Support the Renovation Wave in EU Member States.

³⁰⁴ No mention to “Esco”, “Energy services” nor “Energy Performance contracting” (in Romanian) were found in the text of the approved national RRP.

EU support

The expert assessment of EU Support in the EU Survey 2022 indicates an absence of impact on EnPC markets.³⁰⁵ This assessment has been revised to recognize technical support to Romania and the effects of grants. Two key H2020 projects have worked on the development of EnPC capacities during the reported period, i.e. by promoting green mortgages for EnPC in private residential buildings (SMARTER – 15 May 2019– 14 November 2021) and addressing split incentives in the adoption of EnPC in both public and private buildings (GuarantEE- 1 April 2016 - 31 March 2019). Moreover, the EC and the WB provided technical assistance through a trust fund to accelerate the energy renovation of buildings. On the contrary, the effect of EU grants from the RRF and Cohesion Policy Funds, implemented with high grant investment rates, is considered to prevent EnPC.³⁰⁶

Table A 156. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)			2		Legal framework	none
Guarantee Facility of the Smart Finance for Smart Buildings initiative			0		Legal framework	none
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)			-2		Legal framework	none
InvestEU			0		Legal framework	none
RRF			-2		Depending on implementation	none
De-Risking Efficiency Platform (DEEP) and EFIG Underwriting Toolkit					No data	No data
European Green Deal, Fit for 55			1		Legal framework	none

Source: EU Survey 2022.

Perspective

There are no expected market developments in the period 2022-23. According to experts responding to the EU Survey 2022, this lack of activity expected relates to the lack of concrete and useful references to EnPC in the RRP and the delayed drafting of model contracts.

Recommendations

Given the difficult status of the building sector and the enduring barriers, some reviewers recommend efforts to be allocated to public lighting. Whilst this could be positive for developing the EnPC sector, the pressing targets and the risk of locking in the potential for decarbonising the built infrastructure make it necessary to

³⁰⁵ The project SMARTER Finance for Families (2019-21) worked on the development of green mortgages for EnPC through the development of a tool for holistic green certifications for banks to qualify finance projects, GuarantEE (2016-19) backed the assessment of barriers in the public sector and provided input for the development of models and guidelines.

³⁰⁶ In Romania multi-apartment building renovation is realised via local governments and the grant rate of these projects was recently increased to 97%, with a majority of grant from the EU and the national government, and a smaller share of the local government.

appeal to EnPC as a mechanism to deepen the efforts in this domain. This is the position found common in other input to the EU Survey 2022 and the literature (WB and EC 2022; Renovate2recover.³⁰⁷

- a) Development of a legislative framework with a focus on modernising the heating and cooling of buildings alongside DHC to avoid locking in the potential by transitioning to renewable-based solutions;³⁰⁸
- b) Long-term budgeting and retention of savings from EnPCs in the public sector;
- c) Upscaling of the Romanian EE Fund (FREE) (indicated in the RRP but “stalled” ever since 2020);³⁰⁹
- d) Documentation of ESCO projects and requirement of adequate measurement and verification;
- e) Elimination of “distortionary grant financing”;
- f) Training of professionals at the local level, including energy managers;
- g) Dissemination of the EnPC model at the local level.

At the EU level, expert recommendations focus on support mechanisms to prioritize projects that meet EnPC criteria of certification, M&V, and qualification. Technical assistance could support the development of projects and training at the municipal level and the creation of one-stop-shops.³¹⁰

³⁰⁷ The World Bank. 2022. Diagnostic Assessment Report. Technical Assistance Facility to Support the Renovation Wave in EU Member States; [Renovate2Recover Full-Study-1.pdf](#) (renovate-europe.eu); [epg-green-recovery-policy-brief-24-nov-1.pdf](#) (europeanclimate.org)

³⁰⁸ There are concerns that the work of the Ministry of Energy on the legal framework may focus on generation and fail to reach out to the consumption in buildings, as well as to potential to jointly address DHC and building renovation (WB and EC 2022).

³⁰⁹ [epg-green-recovery-policy-brief-24-nov-1.pdf](#) (europeanclimate.org)

³¹⁰ [Factsheet of the 1st National Roundtable in Romania – Smafin](#)

22 Slovakia

Comparison previous status

In 2018-19, the Slovak public sector market of EnPC was a mature (25 contracts in the biennium) and developing market projected to maintain growth after uncertainty about the treatment of EnPC in public debt (even since ESA 2010). Ever since the Eurostat and EIB guidance efforts of 2017 and 2018, the public sector started to develop and rely on off-balance contracts soon after. Contracts in the modality of guaranteed and shared savings with a duration of more than 8 years were common in the country. The market was considered well-supplied with providers (the sector had adopted the European code of conduct for EnPC). Projects involved public lighting, public pools of municipal buildings, and social housing, and there were expectations that the central government was also engaging in building renovation. Development of the private sector had taken place, partly due to displacement of providers from the public sector by using ESIF in the public sector.³¹¹ This competition is still in place and furthered by the RRP, even though grant intensity for public buildings has been moderated (reduced from 95% to 70%). The EnPC sector has well received this move. There was a potential need for more facilitators and support to engage with more complex off-balance sheet contract modalities. Although there had been previous experiences with projects operating as one-stop-shops (MunSEFF, SlovSEFF) which promoted integral renovations with subsidies achieving 65% of savings,³¹² these projects were discontinued. EU support through Technical Assistance was highly appreciated for having resulted in projects in the Prešov Region, Bratislava City, Košice Region (currently under implementation), projects under preparation, energy audits and the deployment of energy auditing services by the Slovak Innovation and Energy Agency.³¹³ Even though the public sector was reportedly highly committed to deploying the model, the latter was missing as a part of exemplary efforts in central government buildings (EED Art. 5), and local authorities were driving the model's adoption. In 2018-19, there were expectations on the resolution of compatibility issues between forgoing with off-balance sheet treatment and financial support from national and EU sources. These issues are reportedly overcome through the development of common payment mechanisms.³¹⁴

Current Status highlights

A review of recent government reports shows that EnPC plays a fundamental role in Slovakia's energy-saving efforts. The NECP and the LTRS speak about EnPC for non-residential buildings and efforts to blend repayable and non-refundable EU Structural Funds with EnPC (Private sector ESI Funds 2021-27). The LTRS also emphasizes support for private non-residential building renovation financed by FIs, equity, EU SFs guarantees, and provider financing. Whilst it is unclear to what extent this approach competes with and supports EnPC, the LTRS highlights that there is a risk of lock-in without the combination of EnPC with grant funding. A positive development for EnPC has been the reduction of ESIF and RPP grants for public buildings from 95% to 75%. The NECP and LTRS mentioned plans for Technical assistance for public bodies' lighting and building renovation projects, which have materialized through the support of the Slovak Innovation and Energy Agency.

There are no developments in terms of technical assistance for private commercial buildings. The private sector is most developed in the industrial domain through short projects focused on specific technological measures. In commercial buildings, EnPCs are uncommon and focused on operational optimization through shared savings models. There are no mentions to social housing nor lighting, which are two domains that EC JRC 2021 reported as developed. The LTRS also mentioned plans for the creation of a guarantee facility and a guarantee fund, providing amongst other EnPC guarantees, and the existence of a proposal for a debt-purchasing scheme for EnPC providers. Whilst there are no references to the implementation of these mechanisms, a credit line for ESCOS has been created by Slovak Investment Holding, of which the Ministry of Finance is the only shareholder.³¹⁵ More recently, the RRP mentioned the availability of support for EnPC, and the allocation of funds to technical assistance associated with renovation measures for the residential sector including the creation of regional one-stop-shops.³¹⁶ Currently, there are no one-stop-shops established officially, and some EnPC facilitators (e.g. Energy Centre Bratislava and Enviros) fulfil this role in cooperation

³¹¹ Marcel Lauko. EPC market development in Slovakia. May 15th, 2018 SEI Forum, Warsaw

³¹² Marcel Lauko. EPC market development in Slovakia. May 15th, 2018 SEI Forum, Warsaw

³¹³ The technical assistance from SIEA for the public sector is described in <https://www.siea.sk/podporne-programy/technicka-asistencia-pre-garantovane-energeticke-sluzby-vo-verejnom-sektore/>.

³¹⁴ [Prezentácia programu PowerPoint \(mhrs.sk\)](#)

³¹⁵ <https://www.sih.sk/aktuality/slovak-investment-holding-will-provide-a-4-million-loan-to-esco-slovensko-and-the-supported-investments-will-be-directed-towards-energy-saving-of-enterprises>.

³¹⁶ [Renovate2Recover_Full-Study-1.pdf](#) (renovate-europe.eu).

with specialized law and public procurement consultants. According to the EC analysis, there is a need for developing Regional Sustainable Energy Centres (RSEC) and EnPC.³¹⁷ Other reviewers indicate the risk of “a shortage of qualified construction workers to deliver renovation ambitions”.³¹⁸ There have been also calls to “encourage more stringent and ambitious criteria for building renovations...Ensure that the exemption for gas boilers strictly complies with the ‘do no significant harm’ criteria...The RRF, ESIF and other EU funds should shift support currently slated for fossil gas boilers and unsustainable biomass to more sustainable RESs”.³¹⁹ Insufficient information is available to assess Slovakia's market size and contract characteristics. Estimates about market size were produced based on values previously reported by JRC (2017, 2021) and trends identified by consulted experts. Information about an integral renovation of a residential building refers to a project size of €0.7m, with €0.04m € savings per year and 15 years of payback.³²⁰

The table below summarizes the number of contracts and market sizes estimates, based on previous JRC reports and expert input on trends.

Table A 157. Market size and EnPC contract characteristics.

	Public	Private	Overall	Comment
Number of contracts	30	5	35	Estimates based on values previously reported by JRC and trends identified by consulted experts
Overall size m€	15	5	20	
Typical* size m€	0.5	1		
Typical* duration				
Typical* payback (yrs)				
Typical* % of baseline				
Typical savings* MWh/year				
Typical savings* m€/year				

Source: EU Survey 2022, JRC 2021, and JRC 2017.

The market trends reviewed in the EU Survey 2022 are represented in the following table.

Table A 158. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Slow growth	Stable	
Perspective 2022-2024	Slow growth	Slow growth	

Source: EU Survey 2022.

Business environment

The main intervention sites are public buildings and public lighting. The private sector is mainly developed in the industrial domain, but projects focus on short-term contracts focusing on specific technologies. The market's supply side is almost covered, and the quality of services is considered high. There is considerable potential for the development of one-stop-shops, currently fulfilled by private facilitators, which along with regional energy offices, has been reviewed as a need unfulfilled by the RRP.

³¹⁷ [com-2021-339_sw_d_en_0.pdf \(europa.eu\)](https://ec.europa.eu/commission/presscorner/detail/en/com-2021-339_sw_d_en_0.pdf).

³¹⁸ [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](https://ec.europa.eu/commission/presscorner/detail/en/renovate2recover_full_study_1.pdf).

³¹⁹ [2022_02_Reaching-for-a-green-recovery-CAN-Europe-Bankwatch.pdf \(caneurope.org\)](https://www.caneurope.org/wp-content/uploads/2022/02/2022_02_Reaching-for-a-green-recovery-CAN-Europe-Bankwatch.pdf).

³²⁰ <https://doi.org/10.34641/clima.2022.72>.

Table A 159. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	8	2	3	Refers to companies active in the service provision. There are 76 ESCOs registered ³²¹
Facilitators	5	2	3	
One-stop-shops	2			Function conducted by some facilitators, and expected from regional offices to be developed through RRP
Financing actors willing to support EnPC	several	2	2	
Other				

Source: EU Survey 2022.

Table A 160. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	2	2		
Willingness	2	1		

Source: EU Survey 2022.

Contract modalities and alternatives

Ever since the Eurostat and EIB guidance efforts of 2017 and 2018, the public sector started to develop and rely on off-balance contracts soon after. Contract duration of more than 8 years was common in the country (aligning with off-balance requirements). Both guaranteed and shared savings contracts are common. EnPCs in private commercial buildings are implemented to a low extent - usually as shared savings models focused on the optimization of operation.

³²¹ <https://www.mhsr.sk/uploads/files/pxqcJ6lu.pdf?csrc=9542441446897346835>.

Table A 161. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	3	1		EnPCs in private commercial buildings are implemented to low extent - usually as shared savings models focused on optimization of operation
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	0		
Build-own-operate-transfer (BOOT)				
Contract energy management (chauffage)				
Facility management				
Consultancy and technical guarantee				
Energy efficiency improvement contracts				
PPPs				
Other				

Source: EU Survey 2022.

Regulatory framework

It is known that both guaranteed and shared savings modalities are in place in the MS and that Slovakia was an early implementer of the EU regulatory framework of relevance. Support to the market development from regional offices, which may act as one-stop-shops, is planned as a part of the RRP.³²²

Table A 162. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	3		
EnPC Guidelines	3		
EnPC Model contracts public sector (whether off- or on-balance sheet)	3		
EnPC Model contracts private sector	0		Use of model contract from the public sector
Lists of EnPC qualified operators	1		
One-stop-shops	0	Expected development with support of the RRP	
Other information instruments	2		
EnPC demonstration projects	1		
Obligation schemes /White Certificates	0		
Energy Audits	2		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public	1		

³²² [Renovate2Recover Full-Study-1.pdf \(renovate-europe.eu\)](https://www.renovate-europe.eu/renovate2recover_full-study-1.pdf)

bodies' buildings)			
Government rules and practices of procurement, contracting and tendering	0		
Impact of EnPC on public sector performance	1		
Impact of EnPC of public sector on private sector adoption of EnPC	0		

Source: EU Survey 2022.

Financing

There is no information from national experts to assess this domain. Hence the information presented is based on the review of the literature. EU grants, financing instruments, private financing, guarantee funds and forfeiting are available for EnPC projects.

Barriers

Major barriers reported are: a) limited use of EnPC as a part of exemplary efforts (EED Art. 5), restrictions of the Eurostat guidelines on the off-balance treatment of EnPC, c) availability of facilitation to deal with off-balance contracting, and the need of one-stop-shops, d) soft building renovation requirements, and lack of push for renewable sources, and e) potential limitations of the labour force to conduct renovations to the extend ambitioned.³²³

Eurostat treatment of EnPC

An off-balance contract was produced already in 2018 and has been in use ever since, but the number of contracts in the public sector has seriously contracted due to the economic limitations of the Eurostat guidelines. There are sectoral demands for Eurostat Guidelines to be more permissive with EnPC. Progress has been achieved in terms of financing off-balance contracting through forfeiting thanks to communication between the Ministry of Finance and banks.

Drivers

There is no information from national experts to assess this domain. Hence the information presented is based on the review of the literature. In addition to a long tradition of EnPC use, the policy framework has been supportive of EnPC. Policy support to EnPCs was described in the NECP, which specified definitions, a list of providers, annual data collection, development of a model compliant with Eurostat rules, and Technical Assistance projects. The LTRS included support through EU-funded subsidies, loans and guarantees to finance EnPC, and continued technical assistance provided through the Slovak Innovation and Energy Agency, and highlighted that further combination of EnPC with Grants was needed to avoid locking-in a potential. The RRP indicated that funds can be allocated through EnPC. The EC analysis of the RRP indicated the need of structural reforms, Regional Sustainable Energy Centres (RSEC) and emphasis on EnPC. Measures to require the EnPC-ability of projects in the public sector have been in place but information on their success was not found. ELENA support is well appreciated in the MS.

EU support

The most highly appreciated EU support mechanisms as assessed by national experts are Technical Assistance and funding, both through ESIF, Cohesion Funds and the RRF. Support from Horizon program, and ELENA has been important to develop capacities in the MS. These are some of the projects supporting the development of market capacities:

- QualitEE (2017-20), worked on development capacities of standardization, quality assessment, procurement, and financial assessment of projects;
- GarantEE (2016-19), worked on addressing split incentives and rigidity of contracts by developing new model contracts, market development through guidance and examples to municipal clients.

Some of the earliest ELENA projects supporting EnPC took place in Slovakia (both SEPR in Presov region and EE Bratislava started in 2015). An ongoing project, ENREKO, started in 2021 supports the aggregation of public buildings and lighting projects from the municipalities of the Kosice region.

³²³ Limitations about a previously reported on local authorities to engage in contracts with variable service value were discarded by national experts consulted and considered as no longer current.

Although EU funding is considered to have played a role in limiting the interest of EnPC, reduced intensity of grant allocation and, the RRP are considered to have a positive impact by channelling of funds through EnPC. Some lack of clarity and uncertainty in this domain raised the concern of EC in its analysis of the RRP.

Table A 163. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	2	0	2			
Guarantee Facility of the Smart Finance for Smart Buildings initiative						
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	2		2			
InvestEU						
RRF	1.5		2			
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit						
European Green Deal, Fit for 55						

Source: EU Survey 2022.

Perspective

The period 2019-21 was described as one of slow growth in the public sector and stability in the private sector. There are expectations for the public sector to continue this growing trend and the private sector to also join the trend.

Recommendations

A recent review of the Slovak RRP argues that the Regional Sustainable Energy Centres (RSEC) and EnPC are essential for the planning and financing of the achievement of decarbonisation and energy saving targets in Slovakia. The Slovak government should target deep renovations, facilitate regional decarbonisation plans and set targets for the public sector. Recommendations of relevance for the EC, are to “Encourage more stringent and ambitious criteria for building renovations to fully tap into the vast energy saving potential of the sector” and prioritize renewable sources over fossil and biofuel sources to avoid locking in the potential for decarbonisation.³²⁴ Continued support for the adequate deployment of regional offices to provide facilitation and one-stop-shop services able to promote off-balance contracting and to expand the model to the private building sector.

³²⁴ [2022_02_Reaching-for-a-green-recovery.pdf \(bankwatch.org\)](#); [Renovate2Recover_Full-Study-1.pdf \(renovate-europe.eu\)](#).

23 Slovenia

Comparison previous status

In the period 2017-2019 there was a mature public market focused on building renovation in major municipalities (the market had the highest relative size assessed in the EU public sector – JRC 2021) and an overall market characterised as “developed” with slow growth (Refine 2021; JRC 2021). Slovenian public markets were one of the public markets best supplied with provision and facilitation services were, however, demand that surpassed supply these services. The Slovenian public sector contracts (guaranteed savings model) were amongst the largest (>€2m) and longest in the EU, showing a prevalence of deep renovations, maturity, prevalence of trust relations, and availability of public support for EnPC projects.

Government narratives and initiatives appear to have supported EnPC in recent years. Already in the JRC survey of 2020, the targets and commitments of the government, especially major cities, appeared to be a most relevant driver. The strategies of public spending through EnPC were available in the country, and central and regional authorities were using EnPC in their exemplary efforts (Art. 5 EED). Showing interest and awareness on the relevance of EnPC for the achievement of energy saving goals of the country, Slovenia is one of the MSs with a list of service providers specific for EnPCs.³²⁵ Government reporting highlights the relevance of EnPC (referred as “Energy Contracting” or “EPO” in the NECP). The NCEP and LTRS presented plans to foster the extension of the model – until then only successful in the public sector with support deep renovations – to the residential sector through Ecofund (the Slovenian Environmental Public Fund).³²⁶ It is currently expected for 2024. There were also plans to establish a One stop shop for multi-family buildings to support amongst other ESCO projects, by 2021. The plan also indicated an intend to implement, by 2023, a set of financial products to support EnPC, the provision of training, quality assurance, and evaluation tools, as well as financially supporting the emergence of ESCOs, especially SMEs.³²⁷ The use of Cohesion funds was also planned to support ESCo contracting in the public sector. The City of Ljubljana has issued the Local Energy Concept, which includes an ambitious plan to accelerate the energy renovation and PV installations.

Current Status highlights

A stagnant market situation was expected due to the limited number of major cities (Ljubljana and Maribor) where priority public sector actions have already taken place (JRC 2021), the lack of initiatives in the central government, and failure of private markets to take off. Eventually in the EU Survey 2022, growth was reported for both the national public sector (12 contracts signed) and the private sector (number of contracts unknown). The market has remained stable in Ljubljana, where activity was already remarkable in the past, with 2 public contracts and 1 private contract signed in the report period. There is a major potential for renovating poorly insulated multi-family buildings, but ESCO services are not available for this sort of projects. The table below summarizes the data gathered on market and contract sizes.

³²⁵ [Portal Energetika - Seznam ponudnikov energetske storitve – model pogodbenega zagotavljanja prihrankov energije \(energetika-portal.si\)](#)

³²⁶ [English | Eco Fund \(ekosklad.si\)](#)

³²⁷ https://ec.europa.eu/energy/sites/ener/files/documents/si_final_necp_main_en.pdf

Table A 164. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	12	1		No national data on private sector
Overall size m€	36	0.5		(Public: 1700 MWh/a Private: 1600 MWh/a)
Typical* size m€	3	0.5		
Typical* duration	15	5 -10		
Typical* payback	12-20	8		Depending on grant support
Typical* % of baseline	35	40		
Typical savings* MWh/year	1000	500		
Typical savings* m€/year	0.1	0.05	0.075	

Source: EU Survey 2022

Table A 165. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Rapid take off /(Stable)	Slow take off / (Stable)	Public: Combination of grants (Cohesion Funds) and private financing, standardized implementation framework Private: Energy prices (OPEX optimisation)
Perspective 2022-2024	Stable / (Rocketing)	Slow take off / (Rocketing)	Public: Development of new financial instrument (Cohesion funds); Private: Energy prices, new financing instruments (OPEX optimisation)

Source: EU Survey 2022. Estimates in between brackets refer to Ljubljana.

Business environment

The main intervention sites are public buildings (schools, kindergartens, health centres, sport centres), and public lighting (both rated 3/3), and district heating and cooling (as reported in Ljubljana, 2/3). Actions in industry are more than less restricted to lighting, heat and cold supply, compressed air, and heat recuperation. In general, EnPC covers mainly integral renovations, installation of building controls, energy management, monitoring and verification, and installation of renewables. In Ljubljana the installation of demand flexibility and energy storage capacity was reported as relatively relevant (2/3), whilst maintenance (1.5/ 3) and replacement of specific instruments (0.5/3) is less common. There are expectations on EnPC to gain relevance in residential buildings.

The supply side of the market is almost covered, and the quality of services considered high in Ljubljana. However, aligning with findings in previous reporting (JRC 2021), there is room of development of provision in the country, and facilitation could have greater presence. Five ELENA Technical Assistance has supported facilitation. There is also a potential for the development of One stop shops, currently absent in the country. Their development could contribute to also boost the currently limited understanding and interest, especially amongst the private (e.g. multifamily buildings) and financing sectors, as well as the central government.

Table A 166. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	8328	1.5	2.5	Non-SMEs are the dominant category (REFINE 2021) ³²⁹ , 3 large providers have the largest market share
Facilitators	10	0.5	2	Facilitation supported by ELENA is key (5/10 facilitators)
One-stop-shops	0	0	0	
Financing actors willing to support EnPC	5	0.5	0.5	
Other				

Source: EU Survey 2022. Estimates in between brackets refer to Ljubljana.

Table A 167. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	2	1.5	0.5	
Willingness	2.5	1.5	1.5	

Source: EU Survey 2022.

Based on the EU Survey 2022, the Eurostat Guidance has had a sizeable impact in the revision of contract models, improving implementation issues, and overall making the public sector "More willing to pay for an EnPC service and not for an investment in combination with cohesion funds". Off-balance contracts are considered satisfactory in Ljubljana, where some 80 % of the contracts signed are off-balance. At national level there is a need to verification with Eurostat, and no off-balance contracts have been signed. In Ljubljana these contracts are considered adequate, (80 % of public projects), but are not used in the central government. Regarding the treatment of EnPC as debt in the private sector, the largest Slovenian service providers use IFRS and this has no impact on the potential for refinancing (Refine 2021).

Contract modalities and alternatives

The responses obtained to the EU Survey 2022 largely differ in the relevance granted to contracting modalities at national level and as reviewed for Ljubljana. At national level, the guaranteed savings model prevails in the public, and to an extent in the private sector, whilst in Ljubljana both the guaranteed savings and the shared savings coexist in the public sector. The latter model prevails in the private sector but supply contacts are most common. Fundamentally, no respondent referred to any contracting modalities as directly competing with EnPC. The respondents agree to the relevance of contract energy management (2.5/3, overall). The combination of PPP with EnPC in public sector projects was reported as relevant, and PPPs are a key model used in the public sector (3/3).

³²⁸ [Portal Energetika - Seznam ponudnikov energetskih storitev – model pogodbenege zagotavljanja prihrankov energije \(energetika-portal.si\)](https://portal.energetika.si/seznam-ponudnikov-energetskih-storitev-model-pogodbenege-zagotavljanja-prihrankov-energije)

³²⁹ [REFINE-D2.4-Refinancing-Market-Assessment-Report.pdf \(refineproject.eu\)](https://refineproject.eu/REFINE-D2.4-Refinancing-Market-Assessment-Report.pdf)

Table A 168. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	2.5	1	1.5	
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1.5	1.5	2	
Build-own-operate-transfer (BOOT)	1.5	2	2	
Contract energy management (chauffage)	1.5	2	2	Supply contracts are more common than EnPC in the private sector
Facility management	1.5	2	2.5	
Consultancy and technical guarantee	0.5	1.5	1.5	
Energy efficiency improvement contracts?	0	0.5	0	
PPPs	3	1.5	2.5	PPPs operate in combination with EnPC in the public sector
Other	0	1	0	In the private sector there are some power purchase agreements

Source: EU Survey 2022. Estimates in between brackets refer to Ljubljana

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, is most favourable reviewed in Ljubljana, in comparison with the overall country. Most appreciation is deserved by definitions, guidelines, model contracts for the public sector, demonstration projects, procurement rules and white certificates. Off-balance contracts have not been reviewed by Eurostat, and there is a need of formal certification of providers, simplification of the legal framework for PPPs, the introduction of one stop shops, and the improvement of audits, whose use has been mainstreamed through requirements for the use of public funds supporting EnPC.

Of note, whilst the exemplary role played by the government is considered limited (1/3), EnPCs are considered to play a relevant role (2.5/3) in public interventions to save energy. These may be insufficiently used to transform the private sector (1/3).

Table A 169. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	2.5	330	
EnPC Guidelines	3		Integration of earthquake resistance
EnPC Model contracts public sector (whether off- or on-balance sheet)	3		On-balance model (latest models were not submitted for Eurostat review)
EnPC Model contracts private sector	1.5	Lighting is becoming standardized in the industry	
Lists of EnPC qualified operators	2		Lack formal qualification system
One-stop-shops	1		Needed for the residential sector
Other information instruments	2		
EnPC demonstration projects	3	Three pilots were implemented in the public sector	
Obligation schemes /White Certificates	2.5		
Energy Audits	2.5	Required for grant financing, part of financing model	Quality of audits needs to improve
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	1		The central government prefers partial renovations and public procurement.
Government rules and practices of procurement, contracting and tendering	3		The PPP legal framework continues to be complex for the government projects

Source: EU Survey 2022.

Financing

There is a wide variety of financing sources and instruments. The estimates for the overall country and Ljubljana differ but it can be generalised that financing is usually brought by providers. Grants are also relevant, especially in the public sector. The Ecofund is supporting deep renovation in residential buildings. Debt financing is also common. Guarantees and guarantee funds have a relevance in Ljubljana not identified for the overall country. The relevance of forfeiting is sizeable, especially in Ljubljana. This is the case also for SPVs, equity, and project financing. There are no barriers to the combination of EU funds with EnPC.

³³⁰ The government site <https://www.energetika-portal.si/podrocja/energetika/energetska-prenova-javnih-stavb/projektna-pisarna/> was cited as a good practice.

Table A 170. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1-3	1		
Provider funds	3	2		
Third-party Public funds	0-3	1		
Third party Private funds	0-2	0		
Private financing inst.	1.5	1.5		
Public financing inst.	0.5	0.5		
Debt financing	2	2		
Guarantees and guarantee funds	1.5	1		
Equity financing	1	1		
Mezzanine financing	1	1		
Project financing	1.5	1.5		
Leasing	0	2		
Special Purpose Vehicles	1.5	2		
Grants	3	2		
Forfaiting	1.5	1.5		
Other				

Source: EU Survey 2022.

Eurostat treatment of EnPC

Based on the EU Survey 2022, the Eurostat Guidance has had a sizeable impact in the revision of contract models, improving implementation issues, and overall making the public sector "More willing to pay for an EnPC service and not for an investment in combination with cohesion funds". Off-balance contracts are considered satisfactory in Ljubljana, where some 80% of the contracts signed are off-balance. At national level there is a need to verification with Eurostat, and no off-balance contracts have been signed. Regarding the treatment of EnPC as debt in the private sector, the largest Slovenian service providers use IFRS. The use of EnPC has no impact on the potential for refinancing (Refine 2021).

Barriers

Responding to financing barriers faced by providers, the LTRS proposed a debt-purchasing scheme for EnPC providers, and also indicated possible developments in terms of creation of a guarantee facility and a guarantee fund to provide, amongst other, EnPC guarantees. This is important because, in Slovenia, the own funds of providers are the main source of funding in the country. As of beginning of 2021, further financing was considered by stakeholders to be "moderately difficult" and although "some ... Slovenian financing institutions are using a kind of refinancing scheme (repurchase of long-term receivables or acquisition of SPV company from the EES providers)". These and other refinancing mechanisms would benefit from the existence of state-backed guarantees (Refine 2021), not yet in place.]The renovation both as related to the overall RRP (€86m of a total of €1.8b) and in Country commitments to climate contributions there are plans for a revolving fund for renovations in the public sector to be self-financed with savings.³³¹ The later was reviewed with concern by sectoral experts. The creation of this fund was reported as an opportunity for ESCO financing

³³¹ On 20 August 2022, the RRP available on the EC site was in Slovenian (<https://www.gov.si/zbirke/projekti-in-programi/nacrt-za-okrevanje-in-odpornost>). The current review is thus based on an automated translation, and the EC review ([Country Specific Recommendations and Recovery and Resilience Plans - Thematic overview on climate and green transition related issues \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1); EUR-Lex - 52021SC0184 - EN - EUR-Lex (europa.eu))

to be able to participate in capital-intensive refurbishments with smaller savings, as highlighted in the EC review of the national RRP.³³²

The participants in the EU Survey 2022 highlighted as the major barriers limiting the market development in 2020-21 the low energy prices, and the limited implementation capacity in both the public and private sector, as well as the need of technical support. In the private sector there is a demand for one stop shops and low loan fees, especially in the industry, where there are long payback times. The major concern is the increasing complexity of the model, especially in the public sector. Moreover, there is limited use of the model in central government buildings, where partial renovations and conventional procurement are preferred. In the upcoming period 2022-2023, complex needs in public buildings, involving a need for energy and earthquake retrofit and cultural heritage protection bring about a new barrier. Support oriented through grants in the private sector are expected to become problematic for EnPC development.

Drivers

Participant experts in the EU Survey 2022 report the combination of cohesion funds and private financing, and the standardization of implementation as the major drivers in the public sector in the period 2020-21. The use of EU funds and national funds to support new financial instruments is expected to continue being a driver in the period 2022-23. In the private sector, energy prices and OPEX optimisation as the major drivers for both the period 2019-21 and 2022-23. There are expectations on the introduction of on-bill financing in the residential sector which is planned to combine financing from providers and grants.

EU support

EU Support is considered to be a key market driver for the public sector markets in 2019, ELENA was highly appreciated, and already in 2019, EFSI support was made available to RESALTA which was the first beneficiary of this form of support (JRC 2021). *Further* capacity development has taken place in Slovenia with the support of H2020 projects which address key needs, including quality provision and refinancing mechanisms.³³³

The most appreciated EU support mechanisms are ELENA, for its capacity to generate project pipelines, and ESIF, whose funds are used in combination with EnPC. However, there are concerns about the guarantees needed to opt to ELENA and the need of publicity to the program. The European Green Deal, Fit for 55 and NextGenerationEU packages are considered to have a sizeable positive impact. The Guarantee Facility of the Smart Finance for Smart Buildings initiative, ESIF, and InvestEU are considered to have positively influenced the attitude of financing actors.³³⁴

In the EU survey 2022, experts identified a potential at national level for EU support mechanisms to be better allocated according to needs. A respondent speaking about Ljubljana referred to the need to incorporate earthquake resilience measures in EU support, and prioritizing support for EnPC in multi-apartment buildings. For instance, since 2019 all building renovations conducted by the City of Ljubljana (schools, kindergardens, cultural and medical buildings) include earthquake protection according to the latest building codes and standards.

³³² [Country Specific Recommendations and Recovery and Resilience Plans - Thematic overview on climate and green transition related issues \(europa.eu\)](#); [EUR-Lex - 52021SC0184 - EN - EUR-Lex \(europa.eu\)](#). Capital allocation to sustainable mobility (€311.9m – about one third of the fund), and to RES capacity and RES district heating (€146m) could be an opportunity for EnPC investment in public lighting, yet this possibility was not indicated in the RRP, leaving uncertain what may be the effect of the RRP in the EnPC markets operating in these areas. The EC commentary did not mention the absence of EnPC in the RRP as problematic [one reason could be the EC being aware that EnPC being supported by other EU funding sources].

³³³ Recently, support received during the reported period include project QualitEE (June 2017-June 2020) developed capacities in terms of quality assurance, assessing the duration of EnPC contracts (2019), and advising on the choice of types of business models (guaranteed, shared), ultimately contributing to fill the trust gap and increase the knowledge of market actors (QualitEE 2020) [D5.4 National-Business-Case Slovenia.pdf \(qualitee.eu\)](#). Refine (June 2020- May 2023) is assessing the availability of refinancing and state-backed guarantees has provided relevant knowledge and recommendations, referred in this report.

³³⁴ EU support through ESIF is considered to have a multiplier effect of 3 on private investment (for each EU euro invested, three euros are invested by private actors). It is considered that the uncertainty generated by the gradual introduction of new funding is slowly being overcome, in a context generally willing and able to combine EU funding with EnPC (exceptions being the central government and multi-family apartments).

Table A 171. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	2	1		0	Guarantees required, long process, insufficient public level of information	5 ELENAs projects have provided pipe-lines of EnPC projects
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	1		1		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	2	1		1		
InvestEU	0	0		0.5		
RRF	1	0		1		
De-Risking Efficiency Platform (DEEP) and EFIG Underwriting Toolkit	0	0	1	0		
European Green Deal, Fit for 55	1.5	0		0		Slow progres

Source: EU Survey 2022.

Perspective

The participant experts responding to the EU Survey 2022 expect the market to remain stable in the public sector, and to slowly take off in the private sector. Fast growth is expected to take place in both sectors in Ljubljana.

Recommendations

Recommendations in the EU Survey 2022 involve strategic allocation of support allocation (e.g. through EnPC, to multi-family buildings),³³⁵ the development of facilitation and one-stop shop capacities, and formal certification of providers and facilitators, simplification of the legal framework for PPPs, the development of technical and financial capacities in the central government, and the development of improved financial mechanisms to support EnPC in a context of needed deep renovation and earthquake resilience interventions. Support is particularly needed in multi-family buildings.³³⁶ There is also a potential for off-balance contracts to be reviewed by Eurostat and then used in the enactment of the central government buildings' exemplary role.

Recommendations of relevance for the EU is continuing to support Slovenia with technical assistance and simplification of the application procedure, promoting the national use of financing instruments and supporting the certification of providers and facilitators.

³³⁵ A mechanism for preferential use of EnPC for overall energy performance interventions in Slovenia was previously recommended (JRC 2021). One such mechanism could serve to further the impact of RRF.

³³⁶ According to national reviewers this may require supporting small ESCOs which are likely more interested in conducting this work than the two major players.

24 Spain

Comparison previous status

During previous reporting period, a set of key conditions were established, including a standard for ES providers (2018) which includes qualitative and solvency criteria and has therefore fostered trust³³⁷. This standard adds to the existence of sectoral standards (ESE and ESE plus, with 8 ESCOs labelled) (Guía Anese 2020).³³⁸ The Public Sector Contracts Act (2017)³³⁹ added clarity to the legal context and, amongst other, introduced a de-indexation of contract payments from inflation, hence adding complexity to ESCO contracts. There was also ongoing development of model off-balance contracts, and some models were already in use. According to sectoral estimates, EnPC in the public buildings of the administration would suffice to achieve the savings planned in the NECP.³⁴⁰

Current Status highlights

The national reporting highlights the pioneering role of autonomous regions, which conduct their own energy efficiency plans for public buildings, and a role of the central government in promoting energy services, included an intend to make available new support to ESCOs [materialized?], and a promotion of self-sufficient energy consumption in Central Government buildings, especially through turnkey solutions. These model contracts allow for long term projects. An update and development of new contracts is planned for the public and private sectors (LTRS, NECP). New guidelines and contracts have been developed in the autonomous region of Navarra.³⁴¹ Following plans indicated in the LTRS, ESEs receive support form EU funding, and is expected that RRF have a similar allocation – although this was not indicated in the RRP.

The main intervention sites are public lighting, followed by buildings and industry. Some project has addressed district and residential intervention sites. The types of interventions involve almost to the same extent the replacement of specific elements/ systems, maintenance, energy management and installation of RES.

The table below summarizes the data gathered on market and contract sizes.

Table A 172. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	175	525	700	Estimates based on national survey
Overall size m€	190	570	870	Estimates based on national survey
Typical* size m€	1-2	1	0.6-1	Contracts >€1m (with PV) are rare
Typical* duration	10-15	7-10		Has shortened for the private sector
Typical* payback	7-10	5		
Typical* % of baseline	70 (public lighting only)		37	
Typical savings* MWh/year			Electricity: 0.2 Thermal: 0.072	
Typical savings* m€/year			0.11	

Source: EU Survey 2022

The market trends as reviewed in the EU Survey 2022 are represented in the following table.

337 The UNE 216701:2018 standard has been promoted in tenders, which require certificates of accordance to this standard (e.g. Bilbao-Kirolak Maintenance Service With Guarantee And Energy Management, or he Contract for the provision of energy services and maintenance of the public lighting installations of Coslada) and in the LTRS of Spain.

338 Carlos Ballesteros. European ESCO Conference Spanish ESCO Market – trends and barriers 5 October 2022- Frankfurt (Germany)

339 Law 9/2017 includes the Contract for Services with Investment, the Service Concession Contract and the Mixed Supply and Service Contract

340 Source: Francisco Javier Siguenza, AMIs Secretary General

341 Guía práctica de contratación de servicios energéticos con garantía de ahorro (navarra.es)

Table A 173. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable	Slow take off	Divergent responses. Uncertainty NextGen, Covid
Perspective 2022-2024	Slow take off/ Upwards	Slow/Rapid take off	Use of NextGen, Still insufficiently known model. Central government elections may delay take off.

Source: EU Survey 2022

Business environment

The following tables show the availability and quality of services of provision, facilitation and financing. In general, the sufficiency and quality of services is good or very good besides one-stop-shops, which are not so widespread in Spain.

Table A 174. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	50 (102-133 ESCOs)	3	3	Very diverse estimates
Facilitators	20 (15, 400)	2	2	Very diverse estimates
One-stop-shops	<5 (10)	0	1.5	Very diverse estimates
Financing actors willing to support EnPC	15 (8, 20)	2	2.5	Very diverse estimates
Other				

Source: EU Survey 2022.

Table A 175. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1.3	1.4	1.5	
Willingness	1	2	1.7	Higher for street lighting than for buildings

Source: EU Survey 2022.

Contract modalities and alternatives

The EnPC is the major type of ESCO contract.³⁴² The major models competing with EnPC are EPCMs (keys in hand contracts), which incorporate a bunch of services, power purchase agreements (ESC), boot, and chauffage.

³⁴² Carlos Ballesteros. European ESCO Conference Spanish ESCO Market – trends and barriers 5 October 2022- Frankfurt (Germany)

Table A 176. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings	1	1.5	1.5	it is quite common in the residential sector. Competes with EPCM (keys on hand) (3, 3)
EnPC with shared savings	2.3	2.3	2.5	Off-balance in the public sector. In the form of Integral supply contracts (SPs)
Build-own-operate-transfer (BOOT)	1.3	2	1	Services sector (hospitals), private sector. Decarbonization models.
Contract energy management (chauffage)	2	1.5	1.5	Used to be more common in the private sector
Facility management	3	3	3	
Consultancy and technical guarantee	1.5	2	2	Audit without technical guarantee is very common.
Energy efficiency improvement contracts?	1.25	1.75	1	Very few in the public sector.
PPPs	1.5	0.5	1	There is interest but does not take off.
Other	1	3		Power purchase agreement (PPA)

Source: EU Survey 2022.

Regulatory framework

The implementation of the EU policy framework is generally perceived as positive, with the exception of EEOs/WhCs, which are expected to start operating soon. Also, use of EnPC in contribution to the exemplary role of the state could be improved (EU Survey 2022).

Table A 177. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

		Good practice	Remaining barriers
EnPC Definitions: Rating (0-3)	2.7	IDAE and ICAEN	
EnPC Guidelines: Rating (0-3)	2.6	IDAE and ICAEN	
EnPC Model contracts public sector (whether off- or on-balance sheet): Rating (0-3)		IDAE (construction with mixed contracts – SPs, and public lighting) and ICAEN	
EnPC Model contracts private sector: Rating (0-3)	2	Mainly in the industrial sector	
Lists of EnPC qualified operators: Rating (0-3)	1,7		
One-stop-shops: Rating (0-3)	1.5	Currently appearing platforms of energy management with system integration and big data to ease analysis and optimization	lack of submetering, lack of professionals, technological and communication barriers between teams (easier than 10 years ago, but far from ideal)
Other information instruments: Rating (0-3)			
EnPC demonstration projects: Rating (0-3)	2	Success cases (Guía de Tecnologías de ANESE)	Long terms, lack of client knowledge and promotion
Obligation schemes /White Certificates: Rating (0-3)	0	Ongoing creation of CAEs	Unknown, they should become mandatory
Energy Audits: Rating (0-3)	2		Only large consumers, executing measures not mandatory
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings): Rating (0-3)	0.7	€1b	
Government rules and practices of procurement, contracting and tendering: Rating (0-3)	2		

Source: EU Survey 2022.

Financing

According to the EU Survey 2022, provider funds are most widely used (2.3/3) followed by client funds (1.3/3 in the public sector and 2/3 in the private sector). Grants are widely used, especially in the public sector (2.5/3) but also in private contracts (2/3), and private financing is most common in the private sector (2.5/3). Forfeiting is of certain relevance as is the case of a diversity of financing mechanisms (mezzanine financing, equity financing, renting, crowdfunding, equity, crowdlending). Guarantee funds are marginally used in the private sector (GEEVE Fund). In general, there are no reported barriers to the combination of grants and EnPC. There are however difficulties to combine Next Generation Funds with EnPC because the investments need to compute in the balance sheets.

Table A 178. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 =

very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	1.3	2		
Provider funds	2.3	2.3		
Public funds	1.7	1.3		Risk that public funds bring back projects to on-balance sheet
Private funds	0.7	1.7		
Private financing inst.	1.5	2.5		
Public financing inst.	1.5	1		
Debt financing	2.0	1.5		
Grants	2.5	2		
Forfeiting	1	1.5		
Guarantees and guarantee funds	0	0.3		Fondo GEEVE (HousEInvest) Fondo de entidad pública para privado.
Equity financing	0.5	2		
Mezzanine financing	1.5	1.5		
Project financing	1	1.5		
Leasing	1	1.5		
Special Purpose Vehicles	0.5	0		
Other				Renting (1), Crowdfunding (1), Crowdlending (1)

Source: EU Survey 2022.

Barriers

Major barriers highlighted in the LTRS 2020 to the development of EnPC in Spain were:

- Existing Rules on the indexation of prices (“According to the ESCO sector itself, the main obstacle would be the current price review rules relating to public contracts, which, on account of the law on the de-indexation of the economy, would make it difficult to publish review formulas and also to put in place long-term contracts.” (LTRS 2020, p 179)³⁴³
- Limited promotion of rules on ESs in public sector
- Lack of incentives or requirements for EE in public buildings
- Need promotion of EnPC in renovation of thermal installations
- Private sector pursues short-time returns (equipment and lighting).

It is unclear the extent loans and grants to efficiency and RES measures (solar and geothermal) (PAREER II retrofitting programme 2017, ICO line, ERDF support to energy efficiency, and fiscal reform elements (LTRS) have contributed to EnPC or constituted competing financing instruments³⁴⁴. Some projects mentioned in the Spanish LTRS involve a combination of ESCO and public financing. However, the measures proposed in the LTRS addressed issues of further development of models, and the combination of EU support with EnPC projects. Their achievements in the reported period have not been verified.

The major barriers highlighted by experts consulted are the effects of Covid and the uncertainty related to Next Generation funds. Due to NextGen Funds there are no new projects under plain EnPC, but under keys on hand (EPCM - Engineering, Procurement, Construction Management).³⁴⁵ Although there are no direct barriers

³⁴³ According to the Public Sector Contracts Act, price revisions are only allowed in contracts with recovery period of more than 5 years but these revisions are often not included in tenders.

³⁴⁴ Pareer and its continuation Pareer-Crece have been successful in engaging private investment in building renovation. [PowerPoint Presentation \(ca-eed.eu\)](#). It is uncertain whether these programs have supported or worked in combination with EnPC. (Ballesteros 2022).

³⁴⁵ The Plan AGE has allocated €1b to this modality of contract for renovating buildings of the central administration.

to the combination of EU funds and grants with the use of EnPC, the RRF is mainly directed to contract works. Moreover, expectations have caused some projects to be delayed, and countered the development of the off-balance approach (RRF support would compute as debt). A diversity of government approaches has been identified, with some programs allowing ESCOs as potential beneficiaries and others not.³⁴⁶ Aligning with the LTRS, consulted experts are concerned about a lack of client knowledge about energy services, uncertainty of whether investment will generate sufficient revenues to payback the financing, and lack of interest to externalise management areas.

Eurostat treatment of EnPC

As of 2019, off-balance contract models were available for Spain (IDAE), and the autonomous regions of Catalonia and Extremadura. First off-balance contracts signed after the Eurostat clarification of the statistical treatment of EnPC in government accounts were tendered in 2019 (Police and Firefighting School of Mollet).³⁴⁷ Almost 100% of the lighting projects are off-balance, overall, the public sector contracts can be 90% off-balance (some respondents call for a smaller number around 50-60%).

Drivers

New policy developments proposed in the LTRS were a new 'Limited Guarantee Fund' supporting loans from banks and a network of One-stop-shops (regional and municipal scope). Further development of these measures with support of RRF may be a key driver in upcoming years.

EU support

Statistical treatment of EnPC investments has been positive (+2/2) but then the Covid and the RRF had a major impact. Now the contracts need to be adapted and simplified and will be important for some municipalities, concerned about debt.

There is a positive appraisal amounts the experts consulted on the EU support instruments, especially TA. As for the RRF and Next Generation Funds, these are appraised indifferent ways, and there are concerns about the use of grant mechanisms. A preference for loan mechanisms was stated by experts. The allocation of Next Generation Funds in combination with EnPC is problematic because the investments need to compute in the balance sheets.

A diversity of EU projects have supported innovative financing schemes for energy efficiency in Spain: Europace on Home-based finance, RenOnBill on On-bill financing, ESI Europe on insuring energy savings, EEaaS on Energy Efficiency as a Service, Sunshine and REFINE on forfeiting and refinancing for EnPC. Support to energy services has been provided on areas including project development assistance (58 projects and €600m signed since 2011), contract standardization (EIB), quality assurance (QualitEE), smartification of EnPC (NOVICE; AmBIENCE), pay for performance schemes (Sensei), and service bundling (INEEXS).³⁴⁸

³⁴⁶ The national incentives for heat and cold grids based on RES is an example of the former ([Programas de Incentivos a proyectos de redes de calor y frío que utilicen fuentes de energía renovable | Idae](#)).

³⁴⁷ [Anuncios de licitación | Licitaciones | Perfiles de contratante | Plataforma electrónica de contratación pública \(gencat.cat\)](#).

³⁴⁸ Ballesteros, Carlos. European ESCO Conference Spanish ESCO Market – trends and barriers 5 October 2022- Frankfurt (Germany)

Table A 179. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	2	1 (0-2)	1	1	None	HousEEInvest, F-PI, EnerInvest349
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0.5	1	1	1		
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	0	1	1	1		
InvestEU	1	1	1	1		
RRF	-1 -+ 2	-1 -+ 2	0	0	Variable estimates. Uncertainty, concerns about subsidies	
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	-	-	-	-		
European Green Deal, Fit for 55	1.3	1	1.7		Uncertainty and expectation on allocation of loans, not subsidies	

Source: EU Survey 2022.

Perspective

Previous developments and already offset regulatory and trust-related barriers to ESs in the public and private sectors and planned measures in LTRS were expected to further drive market development. An opportunity for the development of EnPC referred in the LTRS was building envelope renovation in private commercial buildings. These envelope renovations could be included in supply and maintenance contracts. In general, improvements in thermal and lighting installations are expected to be the key types of interventions.

Experts consulted expect that most barriers will remain but there is hope on the government increasing support. Increased activity due to the drive of adapted models (CEN-CENELEC) and support programs for municipality interventions. There are now opportunities for forfaiting and SPV, as well as crowdlending and crowdfunding for smaller projects to foster EnPC developments. Next Generation Funds will be useful to support maintenance contracts and EnPC. This needs to be further clarified to the sector.

The RRP does not mention ESCO or EnPC, nor contributions to financing mechanisms potentially beneficial for EnPC (EEF, Guarantees), and allocations to building renovation did not mention minimum savings. Hence it has caused uncertainty. Also, plans for RRP support to RES integration (amongst other in buildings), furthering dynamics after the removal of the “solar tax” in April 2019, and will possibly hinder EnPC development.

A Framework Loan from the EIB “will co finance energy efficiency and renewable energy investments in Spain by energy service companies, The operation is targeted to energy efficiency improvements on the demand

³⁴⁹ [ANESE - F-PI H2020 \(fpjh2020.eu\)](https://www.anece.eu/), [Financing Energy Efficiency using Private Investments | F-PI Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](https://www.enerinvest.eu/), [ENERINVEST Spanish Sustainable Energy financing Platform | ENERINVEST Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](https://www.enerinvest.eu/)

and supply side, in the public and private sector, including public buildings, street lighting and hospitals . Proposed EIB finance EUR 75 million Total cost EUR 200 million (Dinis Rodrigues, 2022).³⁵⁰

Recommendations

Regarding national policies, the ESCO associations call for:

- Addressing barriers of contract duration and complexity;
- Government enabling ESCO access to finance e.g. by starting up the WhC system, promoting financing instruments as opposed to RRP subsidies;
- Standardized M&V protocols;
- Further dissemination of ESCO models to potential customers, especially outside cities, with the support of successful cases;
- Introduction of an action plan for the use of ESCO and EnPC contracts in the buildings of the central administration, including those with military and police functions;
- Collaboration with autonomous communities in the implementation of savings obligations through EnPCs (update of the Plan ESE 2000);
- Tax (VAT) reductions for thermal energy originated from renewable sources of efficient centralized systems, and for the tax on construction, installation and works;
- Reducing red tape, mainly at municipal level, for efficiency and renewable energy interventions; and recognition as of “general interest for the State” of the new efficient and renewable centralized installations.

At the EU level, the recommendations from the two major ESCO associations involve improving further Technical Assistance support for project aggregation; and further promotion of the model.

Good practices

The experience and market development in Spain has enabled the formulation and enactment of projects with more complex governance and financing mechanisms. In 2021, the City of Gijón signed an EnPC for public lighting pursuing 48% of guaranteed primary energy savings and with expectations to reach to 63% of savings. The project has relied on Technical Assistance to bundle up a diversity of investments into a sizeable project, and a forfeiting facility of EEEF which funds the totality of the project (€19.5m).³⁵¹

³⁵⁰ Dinis Rodrigues. 2022. EIB support to the ESCOs/EPCs market European ESCO Conference Frankfurt, 5 October EIB. Energy Efficiency and Energy Advisory Division Projects Directorate

³⁵¹ Rahul Pratap Singh. The European Energy Efficiency Fund European ESCO Conference 2022. Date: 05 Oct 2022

25 Sweden

Comparison previous status

Already in the period 2017–2019, it was observed that Sweden, which used to have a developed public sector market, had become a static market and turned to simpler contract modalities (JRC 2017; JRC 2021). This has been largely attributed to the fact that the public sector had better access to financing than ESCOs, the availability of in-house technical capacities, and building owners wanting to maintain full ownership. An opportunity could be lost to increase the ambition on energy performance interventions through a combination of cheap financing and EnPC capacity.

Current Status highlights

In the past, activity focused on buildings, where most low hanging fruits have been picked. Accordingly, expectations for a stagnation of the market in Sweden have materialized, and experts report a stagnant situation in the private sector and slow take off in the public sector. Slow take off is expected in both areas in the period 2022–2025. However, in a context of increasing energy prices, there is increased preference for efforts in the provision of heat and electricity, and in households and SMEs.

EnPC is present to a limited extent (1/3) in public and private sectors, and the most typical interventions involve industry, and in the public sector maintenance, installation of building control plans and audits (the three categories rated as 2/3). Public lighting and district heating and cooling are of limited relevance (1/3). (No changes reported regarding the sites of intervention).

The national reporting highlights the role of the Swedish Energy Agency in connecting customers and suppliers, promoting the use of energy services by SMEs (the SEA has also created an One-stop-shops for household energy conservation), and having developed a model contract for housing associations, and having a long history of strict efficiency procurement regulations dating back to 2014 (NECP). The supportive framework also includes the role that Kommuninvest (owned by municipalities and regions) in offering loans and advice, as well as the availability of preferential loans, equity and EU-backed Technical Assistance has enabled direct implementation and to an extent the use of EnPC. However, this supportive environment may have turned against EnPC and in favour of in-house interventions. As mentioned in JRC 2021, low demand may have been unable to withhold supply.

The Effect4buildings developed a rapid test to assess the suitability of EnPC, and a turn-key model for partnering (Shared savings?) has been suggested as most favourable and a contract model was drafted.³⁵² This model can be considered a type of shared savings model, under which most projects have been conducted in the country

The table below summarizes the data gathered on market and contract sizes.

Table A 180. Market size and EnPC contract characteristics. Expert responses to: Please respond to the best of your knowledge or estimate. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate.

	Public	Private	Overall	Comment
Number of contracts	0	0		
Overall size m€				
Typical* size m€			0.5	
Typical* duration			3	
Typical* payback			7	
Typical* % of baseline			15-20	
Typical savings* MWh/year				
Typical savings* m€/year				

³⁵² [EPC rapid test | ByggDialog Dalarna; https://www.bygggerre.se/avtal-och-juridik/samverkan-partnering-vaqledning-och-mallar/hjaelpmedel-och-verktyg-foer-partnering/kontraktsmall-med-tillaempningsforeskrift](https://www.bygggerre.se/avtal-och-juridik/samverkan-partnering-vaqledning-och-mallar/hjaelpmedel-och-verktyg-foer-partnering/kontraktsmall-med-tillaempningsforeskrift)

Source: EU Survey 2022.

The market trends, as reviewed in the EU Survey 2022, are represented in the following table.

Table A 181. Market trends 2019-21 and 2022-24. Experts' response to the questions: Could you please identify or estimate the trends for the period 2019-2021? And for the period 2022-2024?

	Public sector	Private sector	Comments
Trend 2019-2021	Stable	Stable	Most low-hanging fruits are gone
Perspective 2022-2024	Stable	Stable/ Slow take-off	

Source: EU Survey 2022.

Status of the business environment

A review of the market actors shows that whilst provision is relatively sufficient, there is a potential for facilitators and One-stop-shops to support the market. The activity of facilitators and one-stop-shops could contribute to overcoming barriers of limited interest and understanding from all actors, especially in the financial sector.

Table A 182. Availability, sufficiency and quality of services. Experts' response to: Please indicate the number of different operators. Then rate the sufficiency of their availability and their quality as 0 (below needs), 1 (barely acceptable), 2 (good), or 3 (very good).

	Number	Sufficiency (0-3)	Quality (0-3)	Comment
Providers	5	2	2	
Facilitators	0	0		
One-stop-shops	1	0	2	
Financing actors willing to support EnPC	10	2	2	
Other				

Source: EU Survey 2022.

Table A 183. Understanding of and willingness to operate with EnPC. Response of experts to: Please rate the understanding of the workings of EnPC, and the willingness to use EnPC of potential clients in the public and private sectors, and of potential financiers. Use the following scale: 0 (absent), 1 (moderate), 2 (good), and 3 (very good).

	Public clients	Private clients	Financing sector	Comment
Understanding	1	1	0	
Willingness	1	1	1	

Source: EU Survey 2022.

Contract modalities and alternatives

As shown in the table below, EnPC operates both with guaranteed and shared savings. There are other contract modalities, mainly facility management and energy efficiency improvement contracts, with which EnPC is not reported to compete directly.

Table A 184. Relevance of different contract models in the public and private sectors of the MS. Experts response to: Please rank from 0 to 3 the extent different service contracts are used (0 = not in use, 1 = uncommon, 2 = common, and 3 = very common). (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public	Private	Overall	Comment
EnPC with guaranteed savings (contractor guarantees energy savings, clients take the financial risk)	1	2		
EnPC with shared savings (both parties share the savings, contractor take financial risk)	1	2		
Build-own-operate-transfer (BOOT)				
Contract energy management (chauffage)				
Facility management	2	2		
Consultancy and technical guarantee	1	1		
Energy efficiency improvement contracts	2	2		
PPPs	1	1		
Other				

Source: EU Survey 2022.

Regulatory framework

In the implementation of the regulatory framework of the EU of relevance for the development of ESCo and EnPC markets, the most favourably reviewed instrument is energy audits (3/3), followed by the EnPC guidelines, model contracts for both public and private sectors, the use of demonstration schemes, white certificates and the use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings).

Table A 185. Experts' perception of the MS's implementation of the EU regulatory framework. Based on your experience and judgement, please rate the implementation and adequacy of the EU policies listed in the table. Use the following scale: 0 (absent), 1 (barely acceptable), 2 (good) or 3 (very good). Please specify good practices and barriers of relevance for EnPC in these domains when possible.

	Rating (0-3)	Good practices	Remaining barriers
EnPC Definitions	1		
EnPC Guidelines	2		
EnPC Model contracts public sector (whether off- or on-balance sheet)	2		
EnPC Model contracts private sector	2		
Lists of EnPC-qualified operators	1		
One-stop-shops	1		
Other information instruments			
EnPC demonstration projects	2		
Obligation schemes /White Certificates	2		
Energy Audits	3		
Use of EnPC to fulfil Art.5 of the EED (Exemplary role of public bodies' buildings)	2		
Government rules and practices of procurement, contracting and tendering			

Source: EU Survey 2022.

Financing

Most projects, whether public or private, are either funded by client or provider funds (See table below).

Table A 186. Financing sources for EnPC projects. Experts' responses to: Please rank from 0 to 3 the extent different financing sources and schemes are used to support EnPC in the public and private sectors (find below some explanatory notes on the types of schemes). Use the following scale 0 = not in use, 1 = uncommon, 2 = common, and 3 = very common. (You only need to fill in the column allocated to overall markets whenever the information is common to both public and private markets, or you lack grounds to provide a disaggregated estimate).

	Public (0-3)	Private (0-3)	Overall (0-3)	Comment
Client funds	3	3		
Provider funds	3	3		
Public funds	1	1		
Private funds	2	1		
Private financing inst.				
Public financing inst.				
Debt financing				
Equity financing				
Grants				
Forfeiting				
Guarantees and guarantee funds				
Mezzanine financing				
Project financing				
Leasing				
Special Purpose Vehicles				
Other				

Source: EU Survey 2022.

Barriers

The major barrier is that real estate owners, both public and private, want to stay in control of their assets.³⁵³ Public bodies have better access to financing than ESCOs and availability of in-house capacities. Since shorter contracting options have been exhausted, these actors are not prone to move onto longer contracts, usually involving maintenance, where limited trust between actors and preference for in-house action weighs down the initiative. This lack of trust was reported in JRC 2021 and the EU Survey 2022 as related to some negative experiences in the past. Moreover, their experiences at the municipal level have been reported as being highly time intensive for clients and not resulting in savings compared to direct implementation in the context of favourable borrowing conditions for municipalities.³⁵⁴

A favourable environment for energy performance interventions appears to have largely fulfilled most of the potential activity for EnPC. The Swedish LTRS indicated a slowing down of the market and the need to address more complex and integral solutions as early as 2014.³⁵⁵ However, EnPC and Energy services were no longer mentioned in the 2020 LTRS and the 2022 RRP, whose green recovery component was sizeable (€1.5b). The EC did not refer to EnPC in its commentary to the Swedish RRP either.³⁵⁶

To this situation contributes the absence of long-term visions, real estate renovation strategies, and mandatory national targets for regions, councils and bodies.

³⁵³ According to a participant expert, there are two types of clients, regardless of belonging to the public and the private sector: those building owners, usually large ones, which have in-house competences and do not like to outsource responsibility and control and other, usually smaller owners, e.g. of industrial buildings, without own capacity and knowledge which are more interested in EnPC and other energy service contracts

³⁵⁴ [Partnering: Next Step After EPC Projects - Effect4buildings](#)

³⁵⁵ "The number of new Energy Performance Contracts (EPCs) has generally been fewer than ten in recent years, whereas the total number since 2000 may be approximately a hundred. The business model for EPCs in Sweden has developed over the last seven or eight years, and it has shifted from being a solution with a focus on technology to a model focussed more on property economics. The focus has shifted from short repayment periods to longer collaboration and greater flexibility in the solutions." (LTRS 2014).

³⁵⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0102&from=EN>

Eurostat treatment of EnPC

No impact of the changes and clarifications on the statistical treatment of EnPC in public accounts has been reported.

Drivers

The major driver identified is the lack of in-house capacities in the smallest real estate owners, both public and private, which drives outsourcing (both for 2019-2021 and 2022-2025). As reported under EU support, there are expectations on the EuropeanGreenDeal and decarbonisation drive to increase the attention paid to EnPC in Sweden.

EU support

According to experts, the European Green Deal, Fit for 55 and NextGenerationEU package are expected to have a sizeable expected impact (2/3) in both the private and public sectors.

Table A 187. Expert assessment of EU support mechanisms. Based on your experience and judgement, please rate the relevance of these EU support instruments in mobilizing the public, private or overall EnPC market. When relevant, also rate the impact on the financing sector. Use the scale -2 (very negative impact) - +2 (very positive impact), where 0 depicts a neutral reaction. When possible, please specify good practices and barriers found in the implementation of these support mechanisms.

	Public	Private	Overall	Financing actors	Barriers	Good practices
Technical Assistance i.e. ELENA, LIFE Clean Energy Transition (Horizon 2020 Energy Efficiency, PDA H2020)	0	0				
Guarantee Facility of the Smart Finance for Smart Buildings initiative	0	0				
Structural and Investment Funds (2014-20) Cohesion Policy Funds (2021-27)	0	0				
InvestEU	0	0				
RRF	0	0				
De-Risking Efficiency Platform (DEEP) and EEFIG Underwriting Toolkit	0	0				
European Green Deal, Fit for 55	2	2				

Source: EU Survey 2022.

Perspective

There are expectations for a slow take-off in the public sector to continue. A possible take-off may occur in the current private sector.

Recommendations

There is a need for long-term strategies and an improved role of SEAPs in guiding municipalities towards adequate assessment of energy-saving options and for granting consideration to external financing options, which should be mapped as a part of municipal planning of energy-efficient investments. Moreover, "Contracting energy service companies (ESCOs) to implement Energy Performance Contracting (EPC) or Multi-Service Contracting that include benefits besides energy saving measures can be a concrete aim in the action part of a SEAP."³⁵⁷ Exchange platforms involving providers and clients have been recommended to adjust contracts to clients' needs (no maintenance, power reduction, load control, decarbonisation) and increase trust. To the latter, it would also contribute to developing accreditation mechanisms for ESCOs and facilitation capacities. Finally, cost reduction could be achieved through project aggregation.³⁵⁸

³⁵⁷ Effect4Buildings 2020. Financial tools and instruments in local and regional Sustainable Energy Action Plans (SEAPs)[Recommendations-for-SEAPs.docx \(live.com\)](#)

³⁵⁸ Anthesis. 2017. Nulägesanalys av energitjänster med garanterad energibesparing i Sverige

EU measures that could be combined with Swedish action are the emphasis of communication on EnPC as more than financing and energy performance as more than savings—EU-level support to accreditation of providers and facilitators.

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