

Fostering public capacity to plan, finance and manage integrated urban REGeneration
for sustainable energy uptake



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Table of content

Acronyms	7
Executive summary	11
1 Objectives of the report	12
2 Policies/ legislation	13
2.1 Europe	13
2.1.1 European Energy Efficiency legislation	13
2.1.2 European Urban regeneration	15
2.2 Spain	18
2.2.1 National	20
2.2.2 Regional	24
2.2.3 Local	27
2.3 Netherlands	28
2.3.1 National	31
2.3.2 Regional	34
2.3.3 Local	36
2.4 Croatia	40
2.4.1 National	40
2.4.2 Regional	50
2.4.3 Local	50
3 Management mechanisms (including coordination and engagement of stakeholders)	52
3.1 Europe	52
3.1.1 European Energy Efficiency	52
3.1.2 European Urban regeneration	53
3.2 Spain	54
3.2.1 National	54
3.2.2 Regional	55
3.2.3 Local	60
3.3 Netherlands	62
3.3.1 National	62
3.3.2 Regional	67
3.3.3 Local	68
3.4 Croatia	70
3.4.1 National	70
3.4.2 Regional	75

3.4.3	Local	76
4	Financial mechanisms	77
4.1	Europe	77
4.1.1	European Energy Efficiency.....	77
4.1.2	European Urban regeneration	79
4.2	Spain.....	81
4.2.1	National	81
4.2.2	Regional.....	83
4.2.3	Local	85
4.3	Netherlands.....	86
4.3.1	National	86
4.3.2	Regional.....	90
4.3.3	Local	91
4.4	Croatia.....	92
4.4.1	National	92
4.4.2	Regional.....	96
4.4.3	Local	97
5	Evaluation of current integration of energy efficiency in urban regeneration plans	99
5.1	Europe.....	99
5.1.1	Barriers.....	99
5.1.2	Drivers.....	99
5.1.3	Tools and/ or instruments	99
5.2	Spain.....	100
5.2.1	Barriers.....	100
5.2.2	Drivers.....	102
5.2.3	Tools and/ or instruments	102
5.3	Netherlands.....	103
5.3.1	Barriers.....	103
5.3.2	Drivers.....	104
5.3.3	Tools and/ or instruments	105
5.4	Croatia.....	106
5.4.1	Barriers.....	106
5.4.2	Drivers.....	107
5.4.3	Tools and/ or instruments	108
6	Evaluation of Multi-level coordination	109
6.1	Spain.....	109

6.2	Netherlands.....	109
6.3	Croatia.....	110
7	References	112

List of tables

Table 1 European Commission urban development agreements	16
Table 2 Spanish National EE legislation.....	21
Table 3 Spanish National Urban and land legislation.....	23
Table 4 Basque Country's Urban and land legislation.....	26
Table 5 Dutch EE legislation	31
Table 6 Dutch Urban and land legislation	33
Table 7 Province of Utrecht legislation	35
Table 8 Province of Utrecht Urban and land legislation	36
Table 9 Utrecht EE legislation	37
Table 10 Croatian National EE legislation	44
Table 11 Basque Country's EE legislation	56
Table 12 European financing sources	80
Table 13 Public Spanish National EE financing sources.....	82
Table 14 Basque Country's Public EE financing sources.....	83
Table 15 Basque Country's Private EE financing sources	84

List of figures

Figure 1 Picture used in the energy label campaign showing the drive towards more energy efficient houses	33
Figure 2 Scheme of chain of government in public building renovation process	72
Figure 3 JESSICA funds. Source: BEI(2008): JESSICA. www.bei.org/jessica	78
Figure 4 Map showing the various postcode areas surrounding central area 8223 where a renewable energy project is presumed in the given example	89

Acronyms

AEEU	Act on Efficient Energy Use
APN	Agency for Transactions and Mediation in Immovable Properties
ARI	Areas of Integrated Rehabilitation
AZRA	Development Agency of Varazdinska County
BBVA	Bilbao Vizcaya Argentaria Banc
BRON	
CEI	National Coordinating Body for Energy Efficiency
CEMR	Council of European Municipalities and Regions
CENEP	Citizen Participation in the planning of energy efficiency improvement
CF	Cohesion Fund
CHP	combined heat and power
COSME	Programme for Competitiveness of Enterprises and SMEs
CPR	Common Provisions Regulations
CTS	
DB-HE	Basic Document "Energy saving"
DED&C	Department of Economic Development and Competitiveness
DG	Directorate-General
DIY	Do It Yourself
DOT	Directrices de Ordenación del Territorio
DvITE	Decreto 241/2012 de Inspección Técnica de Edificios
EASME	Executive Agency for Small and Medium-sized Enterprises
EBRD	European Bank for Reconstruction and Development
EBU	Economic Board Utrecht
EE	Energy Efficiency
EED	Energy Efficiency Directive
EIB	European Investment Bank
EIHP	Energy Institute Hrvoje Pozar

ELENA	European Local Energy Assistance
EMIS	Energy Management Information System
EP	Eligible Producers
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Coefficient
EPC	Energy Performance Contract
EPEEF	Environmental Protection and Energy Efficiency Fund
ERDF	European Regional Development Fund
ES	Spain
ESCOS	Energy service companies
ESD	Energy Services Directive
ESF	European Social Fund
ESIF	European Structural and Investment Funds
EU	European Union
EUKN	European Urban Knowledge Network
EVE	Ente Vasco de la Energia
FIDAE	Fondo de Inversión en Diversificación y Ahorro de Energía
FEMP	Federation on Municipalities and Provinces
GEN	Gebieden EnergieNeutraal
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTR	Grupo de Trabajo sobre Rehabilitación
GTU	Urbanism technical group
HBOR	Croatian Bank for Reconstruction and Development
HERA	Croatian Energy Regulatory Agency
HR	Croatia
HROTE	Croatian Energy Market Operator
HVAC	Heating, Ventilating, and Air Conditioning;
IDAE	Institute for the diversification and saving of energy
IEE	Intelligent Energy Europe

ISPU	Physical Planning Information System
ISSD	Integrated System of Spatial Development
ITI	Integrated Territorial Investments
JASPERS	Joint Assistance to Support Projects in European Regions
JESSICA	Joint European Support for Sustainable Investment in City Areas
L3R	Urban Refurbishment, Regeneration and Renovation Act
LRSUGs	Croatian Local self-government units
LVIV	Ley 3/2015 de Vivienda
LvSU	Ley 2/2006 de Suelo y Urbanismo
MCCP	Ministry of Construction and Physical Planning
ME	Ministry of Economy
MENEAM	Medimurska County Energy Agency
MENP	Ministry of Environmental and Nature Protection
MINGOIP	Ministry of Economy, Labour and Entrepreneurship
MoCPC	Ministry of Construction and Physical Planning
MRRFEU	Ministry of Regional Development and EU Funds
MS	Member States
NCFF	Natural Capital Financing Facility
NEEAP	National Energy Efficiency Action Plan
NL	Netherland
NL	National Level
NRP	national reform programmes
NZEB	Nearly Zero-Energy Buildings
PERHRU	Plan Estratégico de Rehabilitación y Regeneración Urbana
PF4EE	Private Finance for Energy Efficiency
RE	Renewable Energy
REA	Regional Energy Agency
REGEA	North-West Croatia Regional Energy Agency
RES	Renewable Energy Sources

RITE	Regulation of Heat Facilities in Buildings
RSFF	Risk Sharing Finance Facility
SDE+	Stimuleren Duurzame Energieproductie (Encouraging Sustainable Energy)
SEAP	Sustainable Energy Action Plan
SEM	Systematic Energy Management
SME	Small and Medium Enterprises
SMIV	National Energy Savings Measuring and Verification System
SUR	Basque Urban Rehabilitation Societies
SVn	Stimulation fund for housing
TA	Territorial Agenda
TBC	Technical Building Code
TRLS	Consolidated text of the Land Act
UPM	Technical University of Madrid
UPV	University of the Public Country
VNG	Association of Netherlands Municipalities
VPS	Social Housing
VVE	Homeowners Association
WP	Work Package

Executive summary

The FosterREG project aims at enhancing public capacity at local, regional, national and European levels to plan, finance and manage integrated urban regeneration for sustainable energy uptake, through capacity building, promotion and articulation of effective multilevel coordination.

This document, deliverable D2.1 “Energy Efficiency in Urban regeneration framework Report”, is related to Work Package 2 “Framework Design”.

This document analyses existing policies, regulation framework, planning, management and financial mechanisms in each of the national clusters of FosterREG participating countries (Spain, Netherlands and Croatia) at European, national, regional and local levels related to how energy efficiency is integrated in urban regeneration plans.

This document will serve to identify the barriers and set the basis for the achievement of solutions to develop joint strategies for the planning, financing and implementation of energy efficiency measures in urban regeneration plans.

Based on the analysis performed, integration of energy efficiency in urban regeneration plans is evaluated, as well as multilevel coordination in each of the participating countries.

The outputs of this task will be used in the preparation of workshops with stakeholders (defined in Task 2.2) which will be discussed in the national workshops to be carried out within the frame of WP3: “Collaborative Analysis and Proposals”, as well as in project dissemination (WP5). D2.1 “Energy Efficiency in Urban regeneration framework Report” provides input on the policy challenge formulation of the national clusters and the direction of potential solutions.

1 Objectives of the report

This report contains the analysis and setup of the appropriate framework for collaborative work among different levels of the public sector (local, regional, national and European) in the implementation of energy efficiency measures in urban regeneration.

Sections 2, 3 and 4 identify existing legislation, management mechanisms (including coordination and engagement of stakeholders) and financial mechanisms (funds, subsidies, loans, grants...etc.) to drive Energy Efficiency at urban scale in Spain, Netherlands and Croatia. Each section is therefore analysed from these two aspects:

- Energy Efficiency related to urban scale
- Urban planning focusing on urban regeneration

Section 3 of this document "*Management mechanisms (including coordination and engagement of stakeholders)*" is directly related to the stakeholders mapping developed in Task 2.2: Identification of stakeholders in each of the participant countries.

Sections 5 and 6 contains an evaluation based on the previous analysis. Conclusions are gathered on the integration of energy efficiency in urban regeneration plans on one hand, and on the other hand it evaluates multilevel coordination and relationships among stakeholders and public officers at national, regional and local level.

The input of these two sections is used to define the policy challenges in the different workshop within WP3 with stakeholders: setting the stage, gap analysis and developing solutions.

This cross evaluation will be transferred to WP3 (Collaborative Analysis and Proposals) to layout an initial perspective to develop joint strategies.

2 Policies/ legislation

Decision making structures vary from country to country. In this chapter Spanish, Dutch and Croatian legislation and regulations are identified regarding these two aspects:

- Energy Efficiency (EE) related to urban scale
- Urban planning legislation focusing on urban regeneration.

Issues such as how each national legislation and regulations are structured in these two topics (EE and Urban regeneration) are covered. Also, competences at different national, regional and local level are described and regulation instruments provided by legislation are identified.

2.1 Europe

“Europe 2020” is the current key-reference strategy of the EU for the next 10 years approved by the European Council in June 2010. Priorities of “Europe 2020” are:

1. Smart growth: developing an economy based on knowledge and innovation.
2. Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
3. Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion. Territorial cohesion is regarded as a complex umbrella concept that concerns all issues.

Before going on analysing each of the countries’ legislation, a short overview on common European legislation regarding FosterREG topics is exposed below. European legislation takes form of regulations, directives, recommendations and opinion, but only regulations and directives are legally binding for Member States (MS). European regulations are incorporated as it is written to all MS on the same terms, while MS have more freedom to adapt directives into their national law. Once Directives are approved, MS have a period to incorporate the directives (transposition of Directives) into their national law.

2.1.1 European Energy Efficiency legislation

The European applicable law regarding energy efficiency at urban scale is the **Energy Efficiency Directive 2012/27/EU** (EED) binding measures for Member States for the use of energy efficiently at all stages of the energy chain.

The EED replaces two former energy efficiency Directives (2004/8/EC on cogeneration and 2006/32/EC on energy services) and links with the obligations already set out in Directive 2009/125/EC on Ecodesign, Directive 2010/30/EU on energy labelling and Directive 2010/31/EU on the energy performance of buildings. This Directive entered into force on December 2012 and Member States had the obligation of transpose it by June 2014 in general, with some exceptions. Some of the requirements of the Directive in terms of urban regeneration are set below:

As indicated at recital 18, integrated approaches to energy saving and energy supply at local level are taking place in their integrated urban approaches under the Covenant of Mayors initiative.

Article 4 deals with “Building renovation” establishing the obligation for MS to define “a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private”. This strategy shall include:

- (a) an overview of the national building stock based, as appropriate, on statistical sampling;
- (b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone;
- (c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;
- (d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;
- (e) an evidence-based estimate of expected energy savings and wider benefits.

A first version of the strategy shall be published by 30 April 2014 and updated every three years thereafter and submitted to the Commission as part of the National Energy Efficiency Action Plan.

According to Article 7: “Energy efficiency obligations and alternatives”, Member States must send their planned policy measures to the Commission by 5 December 2013, as well as a detailed planned, proposed or legally defined methodology for the operation of their energy efficiency obligation scheme, as well as the policy measures they plan as alternative measures.

End-use energy savings target by 31 December 2020, shall be at least equivalent to achieving new savings each year from 1 January 2014 to 31 December 2020 of 1,5% of the annual energy sales to final customers of all energy distributors or all retail energy sales companies by volume, averaged over the most recent three-year period prior to 1 January 2013.

In relation to the FosterREG focus, it is worth mentioning paragraph 2 which states that “Member State may allow energy savings achieved in the energy transformation, distribution and transmission sectors, including efficient district heating and cooling infrastructure”

Paragraph 7 (a) also points that within the energy efficiency obligation scheme, Member States may include requirements with a social aim in the saving obligations they impose, including requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing.

Paragraph 9 gives Member States the option to take the following policy measures to achieve energy savings:

- (a) energy or CO₂ taxes that have the effect of reducing end-use energy consumption;
- (b) financing schemes and instruments or fiscal incentives that lead to the application of energy-efficient technology or techniques and have the effect of reducing end-use energy consumption;

- (c) regulations or voluntary agreements that lead to the application of energy-efficient technology or techniques and have the effect of reducing end-use energy consumption;
- (d) standards and norms that aim at improving the energy efficiency of products and services, including buildings and vehicles, except where these are mandatory and applicable in Member States under Union law;
- (e) energy labelling schemes, with the exception of those that are mandatory and applicable in the Member States under Union law;
- (f) training and education, including energy advisory programmes, that lead to the application of energy-efficient technology or techniques and have the effect of reducing end-use energy consumption

Article 18 encourages the promotion of the energy services by MSs such as ESCOs.

In accordance to Article 24: Review and monitoring of implementation, the Directive requires Member States to establish and publish by 30 April 2014 their long term strategies for building renovation, a crucial obligation given that nearly 40% of final energy consumption is in houses, public and private offices, shops and other buildings (under recital 16).

To reinforce the lead of the public sector it is demanded that 3% of buildings owned and occupied by central governments should be renovated each year according to the level that each Member State has set under the Energy Performance of Buildings Directive (Article 5: "Exemplary role of public bodies' buildings").

This strategy is part of each MS National Energy Efficiency Action Plan which is updated every three years.

By 31 December 2015, Member States have to carry out and communicate to the Commission a full assessment of their potential application of high efficient cogeneration as well as efficient heating and cooling urban systems.

A key part of Energy legislation is the Directive 2002/91/EC, Energy Performance of Buildings Directive (EPBD), first published in 2002, which required all EU countries to enhance their building regulations and to introduce energy certification schemes for buildings.

2.1.2 European Urban regeneration

Urban issues are not a direct European Union (EU) competence and therefore there is not a specific legislation on this topic. Having said that, EU legislation has direct implications for urban policy making, as it is where all different sectoral policies confluence: urban planning, mobility, environment, employment, and socio-economic.

In 2000, the Lille Agenda set a framework for cooperation on urban policy and the development of common policies (still taking into account the differences between cities and countries). Under the European objectives and common principles for a sustainable and balanced urban development EU has developed a common policy for cities and urban development through agreements for Europe as shown below:

Agreement	Year	Web
"Leipzig Charter on Sustainable European Cities"	2007	http://ec.europa.eu/regional_policy/archive/themes/urban/leipzig_charter.pdf
Toledo informal ministerial meeting on urban development declaration	2010	http://ec.europa.eu/regional_policy/archive/newsroom/pdf/201006_toledo_declaration_en.pdf
Territorial Agenda of the European Union 2020. Gödöllő, Hungary	2011	http://www.eu2011.hu/files/bveu/documents/TA2020.pdf
Riga Declaration of Ministers towards the EU Urban Agenda	2015	https://eu2015.lv/images/news/2015_06_10_EUUrbanDeclaration.pdf

Table 1 European Commission urban development agreements

"Leipzig Charter on Sustainable European Cities"

Integrated urban development policy approach is recommended as well as modernizing infrastructure networks and improving energy efficiency by energy efficiency of buildings improvement, both existing and new buildings.

- Renovation of housing stock as a strategy to impact on energy efficiency and improvement of a resident's quality of life.
- Improving existing building stock in deprived neighbourhoods with regard to their design, physical conditions and energy efficiency.
- Combating climate change by improvements in housing standards both in new buildings as well as in existing buildings bear the biggest potential for increasing energy efficiency within the EU.

Toledo informal ministerial meeting on urban development declaration

In the Declaration of Toledo it is suggested the importance and strategic potential of the **Integrated Urban Regeneration** for an intelligent, sustainable, and socially inclusive urban development in Europe.

Part C of the Toledo Declaration stresses the need to consolidate a European Urban Agenda in the future. In 2014, the Directors-General of the EU responsible for urban development presented a joint position which highlights the importance of strengthening the urban dimension in the new scenario articulated coherently between territorial and urban issues.

Territorial Agenda of the European Union 2020

Territorial Agenda 2020 (TA 2020) is the action-oriented policy framework of the ministers responsible for spatial planning and territorial development in support of territorial cohesion in Europe. Based in the principles of the previous declarations priorities of the TA 2020 are:

1. Promoting polycentric and balanced territorial development as an important precondition of territorial cohesion and a strong factor in territorial competitiveness.

2. Encouraging **integrated development in cities**, rural and specific regions to foster synergies and better exploit local territorial assets.
3. Territorial integration in cross-border and transnational functional regions as a key factor in global competition facilitating better utilisation of development potentials and the protection of the natural environment
4. Ensuring global competitiveness of the regions based on strong local economies as a key factor in global competition preventing the drain of human capital and reducing vulnerability to external development shocks
5. Improving territorial connectivity for individuals, communities and enterprises as an important precondition of territorial cohesion (e.g. services of general interest); a strong factor for territorial competitiveness and an essential condition for sustainable development
6. Managing and connecting ecological, landscape and cultural values of regions, including joint risk management as an essential condition for long term sustainable development

As mentioned earlier Territorial cohesion is a large umbrella under which urban issues are considered. The Common Provision Regulation of the EU 2014-2020 Cohesion Policy investments implemented Integrated Territorial Investments (ITI) as a new tool to develop actions on different scales of urban development, as it is later explained in the Financial Mechanisms Section.

Urban Agenda. Riga Declaration of Ministers towards the EU Urban Agenda, 10th June 2015

Recently MS's Ministers responsible for territorial cohesion and urban matters showed their political support for the development of the EU Urban Agenda. The EU urban agenda should "provide an operational framework and effective instruments to horizontally improve the urban dimension in European policymaking". Multi-level governance and involvement of local and regional authorities in policy making is pointed in many of the agreements.

For example, one of the significant agreements reached includes to "strengthen the intergovernmental cooperation on urban and territorial development, in order to provide a clear contribution to the development and implementation of the EU Urban Agenda".

The European Commission has presented the results of the public consultation launched in July 2014 for an EU Urban Agenda¹.

Next step, following the Riga declaration, is identifying the priority themes which will be part of the EU Urban Agenda and selecting those to be dealt shortly and those which can be developed in the long term.

Year 2016 is the objective to have an agreed Urban Agenda.

¹ http://ec.europa.eu/regional_policy/sources/consultation/urb_agenda/pdf/swd_2015.pdf

2.2 Spain

The Spanish Public administration is organized on three levels according to the distribution of competences in the 1978 Constitution, from highest to lower territorial scope:

- State General Administration
- Regional Governments
- Local administrations

Related to the FosterREG project scope, the competence of Energy is assigned to the State General Administration under the Secretariat for Energy of the Ministry of Industry, Energy and Tourism, while urban affairs are under the competence of Regional Governments and local administration.

The following analysis is mainly focused in the case of the Basque Country for regional legislation and the city of Bilbao for the local scale.

Energy context in Spain²

External energy dependence of Spain is much higher than the average of the European Union due to the shortage of energy resources. Spain imports practically its entire petroleum products and has a reduced contribution of national resources.

Energy demand has experienced an increase in the past three decades, over which four energy as well as financial crisis (1973, 1979, 1993 and 2008) have taken place worldwide, with negative impact on economic activity and the demand for energy in the majority of developed countries.

In the 70s, the energy crisis served for improving the efficiency and the reduction of the energy dependence and legislative development. In Spain these circumstances affected deeply the industrial restructuring of mid-1980s.

In 2005, this upward trend experienced a certain change, due to the current policies related to renewable energy and energy efficiency, registering a progressive improvement in self-sufficiency, reaching a 26% in 2010.

In Spain, due to the impact of the 2008 crisis, the construction industry which, traditionally, has been one of the engines of the national economy in the latest years, experienced a very important slowdown.

Red Eléctrica de España (Electrical network of Spain) is the owner of most of the Spanish high-voltage electricity transportation network and distribution of low-voltage electrical energy is in hands of 5 companies (Endesa, Iberdrola, Unión Fenosa, EDP and E.ON). Due to this oligopoly, energy net balance is not regulated and blocked in Spain.

The new proposed National legislation does not allow self-consumption net balance, the possibility of citizens to produce their own electricity and compensate the surplus to the power grid. Self-consumers would have to pay a transit charge, in the same way as users who only consume energy from the power grid.

²Plan de Acción de Ahorro y Eficiencia Energética 2011-2020: http://www.idae.es/uploads/documentos/documentos_11905_PAAE_2011_2020_A2011_A_a1e6383b.pdf

It is clear that this approach contradicts EU best practices and its EE strategy.

Urban regeneration context in Spain

The end of the Spanish war in 1939 to the 1970s was probably the most important period for urban growth in Spain due to the industrial development and migration from rural areas to cities. The Basque Country's towns and cities in particular experienced a very important urban expansion to allocate the new immigrant population.

Buildings built in this period, between 1940 and 1980, are typical collective housing in open block, usually without elevator. As they were built before the thermal conditions regulations came in place in 1979, they need for intervention related to energy efficiency.

The 1980s is known in Spain for being a transitional period. At government level, Spanish autonomous communities were created and this new regional government assumed their new competences such as urban planning.

In urban planning terms, revisions of all planning took place in this period and a new territorial approach was developed.

All Spanish land laws have tried to regulate the land use defining the rights and obligations of the ownership of the land. Public and private ownership is clearly differentiated.

The industry restructuration on the mid-1980s provided the necessity and opportunity to regenerate many of the abandoned industrial sites located in the cities. That is the case of Bilbao, whose industry either moved out of their original locations along the estuary to more appropriated sites, or was dismantled due to economic inactivity. Many of the remaining sites were transformed for new uses, managed and financed mostly with public money.

Since the 1950s, Spanish governments have fostered housing ownership rather than incentives to rent. This fiscal support for the purchase of housing, and real estate business was the reason for an incredible residential growth between the 1990s up to 2006.

In this period the advantages of the mortgages and permissive land drifted in an unprecedented residential demand. To allocate this residential growth, national land legislation enabled obtaining land and its subsequent urbanisation processes in the suburban areas of cities, producing the effect of a scale change of the city with the consequent problems of mobility and sustainability. This urban model is not sustainable from an environmental and social point of view.

The current 2008 Spanish Land law tries to repair this urban model by reviewing and changing some of the land requirements regarding residential housing and land valuation, avoiding this urban expansionist model.

New Spanish building regulations of 2006 (CTE) derived from EU strategies and legislation, prescribed new energetic requirements to be achieved in new buildings as well as in existing buildings to be refurbished.

Maintenance and conservation works of existing buildings in Spain has traditionally been mainly due to security reasons, structure or envelope deficiencies, or aesthetics. Nowadays, accessibility is the driver for building rehabilitation in Spain more than

energetic needs. The energetic improvement of the building is generally not regarded as an urgent necessity and besides, this kind of refurbishment is more expensive than an aesthetic renovation.

Regarding urban regeneration, Spanish government has noticed lately that cities have urban areas that will become obsolete if this maintenance is not undertaken urgently resulting in social and economic degradation of the area. Some have suffered already this degradation.

National government has approached this problem by launching the new Urban Refurbishment, Regeneration and Renovation Act (L3R) in June 2013, whose objectives are:

- Creating specific mechanisms for the promotion of building rehabilitation and urban regeneration and renewal
- Reconversion and reactivation of the construction sector
- Promoting the quality, sustainability and competitiveness, both of building and land, according to the European framework in relation to the objectives of efficiency, energy saving and energy poverty reduction.

This law has not been applied since it came into force. Tenure status of households in Spain is mostly of ownership and it is the Horizontal Property Law³ which specifies a set of duties and rights that regulates it. The building maintenance and conservation costs are incurred to each owner. In that sense property is very fragmented and managing any rehabilitation process is very difficult.

2.2.1 National

2.2.1.1 ES Energy Efficiency at National Level

In June 2014 the Long Term Strategy for Energy Rehabilitation in the Building Sector⁴ was published in Spain in enforcement of Article 4 of the EED including as stated in the article: Diagnosis, Strategy's objectives, Strategic scenario and Measures.

The precedent of energy efficiency legislation in Spain was set in the late 70's to improve the thermal conditions in buildings because of the high energy price (Real Decree 2429/1979, 6th of July, Basic Building Standards NBE-CT-79, about thermal conditions in building). After that, some other regulations came in place based on energy conservation and efficiency in buildings.

In June 2007, as part of the transposition of the Energy performance of Buildings Directive 2002/91/EU, it was set the procedure for energy certification of new and existing buildings, but it was not until 2013 that came into force the obligation of getting the certificate of energy efficiency, as pointed below.

Energy certification is regarded as a management tool which has been transferred and developed through regional governments and therefore it is raised in Section 3.2.2.1. *ES Energy Efficiency at Regional Level* of this document.

³ <http://www.boe.es/buscar/pdf/1960/BOE-A-1960-10906-consolidado.pdf>

⁴ <http://www.fomento.gob.es/NR/rdonlyres/772D26EF-6906-4AD9-9253-775615069E34/130070/ESArt4ENENER2014010090000ENTRA00.pdf>

As mentioned before, self-consumption and renewable electricity in Spain is not yet regulated due to the oligopoly of the electric companies which supply and distribute low-voltage electrical energy.

Only power consumers with a contracted capacity of less than 100 kW per supply point or facility using any form of renewable technology for power generation are regulated under Royal Decree 1699/2011, of 18 November 2011 but it does not establish the administrative, technical and economic conditions for consumption of the electricity produced within a consumer's network for its own consumption.

Following are the current regulations relevant to energy efficiency, which are related to buildings more than to the urban scale:

Regulation	Title	Website
DECREE 235/2013	Certificate of energy efficiency in buildings	http://www.boe.es/buscar/act.php?id=BOE-A-2013-3904
DECREE 238/2013	Regulation of Heat Facilities in Buildings	http://www.boe.es/buscar/doc.php?id=BOE-A-2013-3905
ORDER FOM/1635/2013	Update of Basic Document DB HE "Energy saving" of the Technical Building Code, approved by Royal Decree 314/2006, of 17 March 2006.	http://www.boe.es/boe/dias/2013/09/12/pdfs/BOE-A-2013-9511.pdf
RD 413/2014, of 6th June	Decree regulating the activity of power production from renewable energy sources, CHP and waste.	http://www.boe.es/diario_boe/txt.php?id=BOE-A-2014-6123
RD 1890/2008	Energy efficiency regulations for outdoor lighting installations	http://www.boe.es/buscar/doc.php?id=BOE-A-2008-18634

Table 2 Spanish National EE legislation

DECREE 235/2013: Related to the certificate of energy efficiency in buildings

The requirements on energy certification in buildings established in Directive 2002/91/EC of the European Parliament and of the Council, of 16 December 2002, were transposed in Royal Decree 47/2007, of 19 January 2007, approving a basic procedure for the energy efficiency certificate in new buildings, leaving energy certification for existing buildings to be regulated in another complementary provision.

As a consequence, this Royal Decree partially transposes the section of Directive 2010/31/EU of the European Parliament and of the Council of 19 May, 2010 relating to the certificate of energy efficiency in buildings, rewording Royal Decree 47/2007, of 19 January, with the incorporation of the basic procedure for the certificate of energy efficiency in existing buildings and taking into consideration the accumulated experience of applying it over the previous five years.

DECREE 238/2013: Regulation of Heat Facilities in Buildings (RITE)

Directive 2010/31/EU Article 8 establishes that Member States shall, for the purpose of optimising the energy use of technical building systems, set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems which are installed in existing buildings.

The amendments introduced under this Royal Decree therefore have two purposes: to incorporate into Spanish law the obligations arising from the aforementioned Directive 2010/31/EU, with regard to thermal installations in buildings, and to update the current regulation on thermal facilities in buildings to adapt it to new energy saving and efficiency needs.

Update of Basic Document "Energy saving" (DB HE) of the Technical Building Code, (TBC) approved by Royal Decree 314/2006, of 17 March 2006.

The Directive 2010/31/EU agree that not only a minimum requirements must be set on energy efficiency of buildings or parts thereof in order to achieve cost-optimal levels, but also that by 31 December 2020, all new buildings must be nearly zero- energy buildings, and that after 31 December 2018, new buildings occupied and owned by public authorities must be nearly zero-energy buildings. This will require the establishment of a nationwide definition of the concept of "nearly zero-energy buildings", stipulating the corresponding level of energy efficiency and the percentage of energy required that must be provided from renewable sources.

The DB HE "Energy saving", is the document which establishes the technical rules and procedures that comply with the minimum requirements of energy efficiency in building together with the RITE regulations, in order to get a rational use of the energy necessary for the use of the buildings, reducing its consumption to sustainable limits. The DB HE encourages that part of the energy consumption comes from renewable energy sources.

DB-HE regards energy saving measures for the building but does not mention any specification to be taken at urban scale.

Royal Decree 413/2014, of 6 June 2014 regulates the business of power production from renewable energy sources, CHP and waste.

Power generation from renewable energy sources and an increase in energy efficiency constitute a basic pillar for meeting greenhouse gas emission reduction targets and other community and international targets, and are also of considerable importance in boosting security of the energy supply, technological development and innovation.

The legal provisions were later developed in successive regulations which have been amended.

In addition to these amendments, various measures were adopted on an urgent basis, such as those set out in Royal Decree-Law 6/2010, of 9 April, governing measures for the encouragement of economic recovery and employment, and in Royal Decree-Law 14/2010, of 23 December 2010, establishing urgent measures for correction of the tariff deficit in the electricity industry. This latter standard, as well as creating a generation toll, also limited the number of operating hours of photovoltaic plants entitled to premium payment (similar measures had already been introduced for wind and thermoelectric power technology under Royal Decree 1614/2010 of 19 November 2010) notwithstanding the possibility of extending the period of receipt thereof. This was later extended in the Sustainable Economy Act 2/2011, of 4 March 2011.

Royal Decree 1890/2008, of 14 November 2008, approving Energy efficiency regulations for outdoor lighting installations and their complementary technical instructions EA-01 to EA-07.

In recent years, there have been further changes that are likely to change the lighting installations currently used in our towns and on our roads. These include enactment of the energy efficiency regulations for outdoor lighting installations (RD 1890/2008), together with the emergence of LED technology and provisions allowing public authorities to hire energy service companies.

Efficiency and energy saving are a priority in any economy, and can be achieved without affecting its dynamism, since they help improve the competitiveness of production processes and reduce both greenhouse gas emissions and the energy bill. Drafting of the Energy Saving and Efficiency Strategy in Spain 2004-2012 (E4) marked a new link in a long chain of regulatory actions, all geared towards improving the Spanish energy system. Implementation of the strategy has promoted a significant reduction in emissions of atmospheric pollutants, in keeping with European directives and international guidelines.

2.2.1.2 ES Urban regeneration at National Level

Housing and urban policies are the competence of the autonomous regions governments but still there are some national regulations which have direct influence in urban aspects.

Following there are the most relevant regulations:

	Title	Website
DECREE 2/2008, 26th June	Land Act	http://www.boe.es/buscar/act.php?id=BOE-A-2008-10792
Law 8/2013, 26th June	Urban rehabilitation, regeneration and renovation Act	http://www.boe.es/diario_boe/txt.php?id=BOE-A-2013-6938
DECREE 233/2013, 5th April	National plan for the development of rental housing, building rehabilitation and regeneration and urban renewal, 2013-2016	https://www.boe.es/boe/dias/2013/04/10/pdfs/BOE-A-2013-3780.pdf

Table 3 Spanish National Urban and land legislation

Land Act (Real Decreto Legislativo 2/2008, de 20 de junio, por el que se aprueba el texto refundido de la ley de suelo (TRLR)

This is the basis for the Spanish urban planning law which regulates the basic land conditions and guarantee equality in the exercise of land use rights throughout the Spanish territory. It also establishes the economic and environmental grounds, and the assessment and the liability of public administrations in relation to land use.

This Decree sets the overall urban planning model, and defines the legal regime of property rights, authority, duties and charges, basic criteria for land use, transformation actions, sustainability of urban development, etc.

In relation to urban regeneration the law provides the exception to degraded areas from the obligation of land use, to replace substandard housing.

Urban refurbishment, regeneration and renovation Act Ley 8/2013, de 26 de junio, de Rehabilitación, Regeneración y Renovación Urbanas. (L3R)

The aim of this Act is to regulate the basic conditions that guarantee sustainable, competitive and efficient development of urban areas by promoting and encouraging actions that lead to the rehabilitation of buildings and the regeneration and renewal of existing urban areas, to ensure a good quality of life for the citizens and ensuring their right to enjoy decent and adequate housing.

Among other things, this law:

- Defines a model for urban intervention on existing cities, in order to gradually adapt the built environment to minimum quality and sustainability standards.
- Defines the scope of urban regeneration and renewal, as well as instruments for building inspection and evaluation.
- Modifies the Land Development Law (Final Disposition 12th) to adjust property rights to interventions on the urban environment, as well as the assessment and expropriation system.

National plan for the development of rental housing, building rehabilitation and regeneration and urban renewal, 2013-2016

This National Plan along with the law 8/2013 of Urban Refurbishment, Regeneration and Renovation Act, have contributed to the Spanish legislative framework to be conducive to urban regeneration. It is divided into 8 programs and provides funds to the regional governments to achieve its objectives.

1. Subsidising of loans agreed upon program.
2. Housing rental assistance program.
3. Programme for the promotion of the public park of rental housing.
4. Building rehabilitation programme.
5. Programme for the promotion of urban regeneration and renewal.
6. Programme to support the implementation of the evaluation of buildings report.
7. Programme for the promotion of sustainable and competitive cities.
8. Programme to support the implementation and management of the Plan.

As explained in following sections, the National Plan funds are distributed to the regions as specified in the Collaboration Agreements between the Ministry of Public Works and some Autonomous Community's governments (regions). Not all programs will be developed by the regions as stated in the Collaboration Agreements.

2.2.2 Regional

From an energy perspective, consumption in the Basque tertiary sector, specifically in housing and buildings, accounts for 19% of final energy consumption, with the residential area accounting for 60% of this figure, compared to 40% for services⁵

⁵ Source: http://www.eve.es/EVE/media/EVE/pdf/3E/Estrategia_energetica-2020_EN.pdf

2.2.2.1 ES Energy Efficiency at Regional Level

As a complement to European and national policies, the Energy Strategy Plan of the Basque Country 2020 (3E 2020) was approved in 2011. Some of the strategic lines contained in the 3E 2020 Strategy under the Energy consuming sector are:

- Line C.3 aimed at reducing energy consumption and increasing the use of renewables in buildings and the home
- Line C.4 aimed at promoting a more energy-efficient and sustainable public administration, specifically, Line C.4.2 aimed at promoting very-low-energy-consumption public housing.

Thus, the target of these lines is to promote energy rehabilitation of buildings and housing with high efficiency systems and equipment beyond the minimum requirements established in the National TBC, with the government playing an important role as a planning agent within the scope of its powers and as an example-setter.

It is each region`s duty the development and implementation of Energy National legislation within its territory.

According to Directive 2010/31/EU constitutes an obligation to issue an energy certificate of buildings by January 2013. This certificate has been considered as a tool of energy management and is therefore explained in Section 3.2.2.1.ES Energy Efficiency at Regional Leve of this document.

2.2.2.2 ES Urban regeneration at Regional Level

The Basque County`s regional government has launched various schemes and grants to encourage urban regeneration, first from a sectorial approach and recently from a more comprehensive perspective.

One of the former Housing Master Plan 2010-2013: "Building refurbishment and urban regeneration plan" main objectives was to promote the rehabilitation and urban regeneration with an integrated approach, that is, considering the backing of social, technical, economic, and community issues into the regeneration. Accordingly, the former Department of Housing, Public Works and Transport developed in 2010 the Strategic Plan of Rehabilitation and Urban Regeneration (Plan Estratégico de Rehabilitación y Regeneración Urbana_PERHRU).

In 2013 the new Basque government, published the "Renove Plan for Housing refurbishment 2013-2016"⁶, favouring policies of rehabilitation, renovation and regeneration of existing buildings as well as consolidated spaces, with the aim of preventing urban expansion.

Following is a relation of the legislation and regulations that apply in the Basque Country related to urban and land affairs:

Regulation	Title	Website
Law 4/1990, 31st May	Basque Country`s Regional Planning	http://www.euskadi.eus/r33-2288/es/contenidos/informacion/

⁶ <http://www.euskadi.eus/bopv2/datos/2013/08/1303670a.pdf>

		dots/es_1165/punto22_c.html
Housing Master Plan 2013-2016	Housing Master Plan 2013-2016: Building refurbishment and urban regeneration plan.	http://www.etxebide.euskadi.eus/x39-contpest/es/contenidos/informacion/orientacion_estrategica/es_etxecont/index.shtml%20-%203255#1298
Law 2/2006, 30th June	Land and Urban Planning Act	https://www.euskadi.eus/bopv2/datos/2014/10/1404145a.pdf
Law 3/2015,	Housing Act	https://www.boe.es/boe/dias/2015/07/13/pdfs/BOE-A-2015-7802.pdf
Decree 241/2012, 21st November	Technical Building Inspection.	http://www.etxebide.euskadi.eus/bopv2/datos/2012/12/1205588a.pdf

Table 4 Basque Country's Urban and land legislation

Territorial Planning Guidelines - Review of dwellings quantification - Ley 4/1990, 31st May, de Ordenacion del Territorio del Pais Vasco. DOT (Directrices de Ordenación del Territorio)

The law which regulates Basque Country's Regional Planning includes the Territorial Development Guidelines (DOT) as a tool to raise any proposal at territorial level.

Within the Territorial Planning Guidelines, each municipality must make a forecast for number of new homes, based on demographic and supply and demand parameters. It is important to note that quantification standards are affected by regeneration projects, as increases in housing units from regeneration projects do not count for planning purposes.

Housing Master Plan 2013-2016: Building Refurbishment and Urban Regeneration Plan - Plan Director de Vivienda 2013-2016.

The Basque Government's Department of Employment and Social Policy has prepared a Plan for Building Refurbishment and Urban Regeneration, aiming at the regeneration of urban spaces and buildings while increasing housing supply, paying special attention to the social aspect and fostering conservation and continuous improvement.

The Department considers necessary to review the administrative procedures that involve a long and complicated process and frequently lack coordination between the different agents offering grants in the various Basque Provinces. It also plans to agree fiscal instruments and analyse their impact; to review the subsidy policy considered too generic, and to review the legal framework which lacks adequate management tools.

Land and Urban Planning Act - Ley 2/2006 de Suelo y Urbanismo (LvSU)

This Act defines urban standards and parameters, as well as the participation of the community on potential generated profits. It also defines certain procedural aspects for processing planning instruments.

Regarding rehabilitation and urban regeneration policy, the law calls for specific attention on areas needing special support and positive discrimination, and includes a series of urban management tools to enable effective action from public bodies. These include enabling a preferential right to public administration to develop certain neighbourhoods or areas in order to promote their rehabilitation and urban regeneration, and flexibility in the use of regional guidelines for urban density. Municipal Local administrations apply this law for the development of their General Urban Development Plan.

Housing Act- Ley 3/2015 de Vivienda (LVIV)

This Housing Act aims at regulating the right to enjoy decent and adequate housing in the Basque Country. It partially transposes the national law in relation to urban environment (mainly L3R) to the regional law. It also regulates the legal status of social housing (VPS).

It establishes the creation of an autonomous body, which will bring together all the public companies and agencies involved in housing, to serve all the activities related to the provision of social housing and accommodation.

This Housing Act also intends to promote urban regeneration and housing refurbishment, being the new autonomous body the responsible for coordination of efforts in this area.

Technical Building Inspection - Decreto 241/2012 de Inspección Técnica de Edificios (DvITE)

It is the transposition of the national IEE -Informe Evaluación Edificio, (Building Evaluation Report), covered by the L3R, to the Basque Country law. It regulates the criteria and requirements to be met by the technical inspection of residential buildings in the Basque Country.

This Decree also creates and regulates the registration of the technical inspection of buildings through a tool called Euskoregite. The information received by the municipalities is therefore sent to a single record for the whole Basque Country managed through the EuskoRegite platform, which is accessible to all citizens. This database will contribute to the definition of urban policies, as well as to defining specific intervention strategies in urban regeneration areas.

2.2.3 Local

It is the local administration's duty to define and develop the General Urban Development Plan and review it every 10 years. Some of them, as explained below, include some EE regulations regarding buildings.

2.2.3.1 ES Energy Efficiency at local level

According to the Energy Strategy Plan of the Basque Country 2020 (3E 2020) some towns have established municipal regulations on energy efficiency that go beyond the minimum requirements established in the Technical Building Code, (CTE) and revise CTE values

upwards, establishing more demanding requirements to prevent construction of buildings of less than Class C.

Municipalities according to the commitments undertaken through the guidelines set in the Local Agenda 21 have implemented Energy Efficiency municipal regulations to obtain a sustainable building development, by including in the buildings energy efficiency and environmental quality parameters.

Regulatory compliance regarding existing buildings is limited to those buildings of more than 1.000 m² or when more than 25% of the total of their external walls is renewed. Class C is required for private building while class B is required for municipal public buildings.

2.2.3.2 ES Urban regeneration at local level

Municipal General Urban Development Plans are developed through Special Plans. Special Plans of Rehabilitation or Regeneration are restricted to specific areas or neighbourhoods of the city and regard those aspects not defined totally in the General Urban Plans' conditions.

Development of these Special Plans of Rehabilitation involves complex and detailed historical, sociological, economic, urban, building studies, time and budgetary planning, as well as very complex municipal approval process and citizen participation.

Many Spanish municipalities have chosen to simplify this complex process by defining Urgent or Preferred Action Areas within the city, according to Municipal General Urban Plans' defined conditions.

The Basque Country Government, in its Decree 317/2002 on Protected Rehabilitation Activities of Urbanized and Built Heritage⁷, defined Areas of Integrated Rehabilitation (ARI) for situations of less complexity and urgency of actions but with similar characteristics.

The recent national law 8/2013 of Rehabilitation, Regeneration and urban Renewal mentioned in previous sections has given a new legislative tool to local administration to strengthen the definition of Action Areas.

Under this law, Action Areas can be defined by principles of economic, social and environmental sustainability, territorial cohesion, energy efficiency and functional complexity. The definition of these Action Areas will lead to improvements in the ownership system to obtain public or private land for justified expansions needs and other legislations involved.

2.3 Netherlands

The Dutch Public administration is organized on three levels according to the Dutch Constitution of 1983, from highest to lower territorial scope:

- The Central government
- The Provinces

⁷ <https://www.euskadi.eus/bopv2/datos/2002/12/0207429a.pdf>

- The Municipalities

However, various other levels can be added: water board, region, and borough.

Related to the FosterREG project topics the competence of Energy is assigned to Central government at the Ministry of Economic Affairs (energy supply, infrastructure, industry and energy markets), Ministry of Interior and Kingdom Relations (energy efficiency in build environment) and Ministry of Infrastructure and Environment (environment, emissions) Urban affairs is under the competence of Ministry of Infrastructure and Environment and Ministry of Interior and Kingdom Relations. The Netherlands is a decentralized unitary state by which tasks are assigned to lower administrative levels. Therefore competences of energy and urban affairs are assigned to provinces and municipalities

The following analysis is mainly focused in the case of the Province of Utrecht for regional legislation and the city of Utrecht for the local.

Energy context in the Netherlands

When the Slochteren natural gas field was discovered in the North of the Netherlands in 1959, it was unclear at the time that it would turn out to be one of the largest fields in the world (2800 mrd m³ natural gas). The deep subsoil in the Netherlands is owned by the state, so exploitation takes place in a public-private partnership between the national government, Shell and Exxon. A nationwide gas network was rolled out from the 1960s onwards and natural gas has been the standard for heating, hot water and cooking in Dutch dwellings ever since. Moreover, about 50% of the electricity use comes from natural gas power plants. The electricity grid expanded from the start of the 20th century, with a large growth after WWII. Mining operations in the south of the country were quickly reduced after the gas discovery, as it was unhealthy and expensive to produce locally. (Bosatlas van de Energie, 2012)

After the oil crises of the 1970s and the Limits to growth report by the Club of Rome, energy efficiency became a topic. The first generation of energy efficient houses (1970s-1980s) have a somewhat lower energy demand, but the quality of the insulation measures is lower compared to what is available today and because of a lack of ventilation, poor indoor air quality and moisture problems are common in these houses. The quality of measures improved significantly from the 1990s onwards. (BRON)

At the end of the 1990s the Dutch energy market was reformed. Consumers were free to choose their energy provider and the energy companies were split up into commercial companies (produces energy and sells it to the consumer) and a public company (who operate the grid between supply and demand). The provinces were shareholders in the energy companies and some of them sold their interest very profitably. They now have a large budget for e.g. energy measures while others have not, forcing different strategies for the energy transition. The share of renewable energy in electricity was around 4% in 2010. (Bosatlas van de Energie, 2012)

Households account for approximately 20% of final energy use in the Netherlands (Bosatlas van de Energie, 2012). The average household uses 1614 m³ of natural gas, of which 79% for heating, 19% for hot tap water and 2% for cooking. The average household uses 3480 kWh of electricity. The average CO₂ emissions of a household are 8160 kg/yr,

of which 36% from natural gas use, 23% from electricity use and 41% for transportation (Bosatlas van de Energie, 2012).

Of these households, approximately 70% is privately owned and 30% is social housing (rent-controlled) (BRON). Privately-owned homes are on average a bit larger and therefore require more heating, which also implies that the savings potential is bigger (Vesta, 2011). It would be logical to presume that private home-owners are wealthier than those living in social-housing dwellings, and therefore could afford to renovate their homes. But since the financial crisis of 2008-2009 and the following recession this assumption is no longer valid as many homes are “under water” (mortgage too high relative to the decreased house value) and/or people have lost their jobs (BRON).

The most common type of house is a 1970s terraced house (Vesta, 2011). However, on neighbourhood level, the great diversity of already applied EE measures per dwelling, makes a full encompassing strategy fit for all difficult to target. Moreover, there are many multi-family buildings where the building is managed in home owners association, a particular share of votes is necessary to approve any measures (such as EE or RES).

The coming years, demographic and economic growth is expected in growth centers such as the urban conglomeration Randstad (which includes a.o. Amsterdam, Rotterdam, The Hague, Utrecht) and contraction in other, more rural parts of the country (BRON).

Urban regeneration context in the Netherlands

The Netherlands has a rich history regarding urban planning and regeneration. The reason for that is the lack of space in general and therefore, the need to use all buildable land with care. It fits with a strong tradition of national spatial planning, wherein the strategy for urban areas is nested. During the '60s of the last century many disadvantaged neighbourhoods in cities were totally demolished for new office and retail space. A countermovement which pointed out the importance of small-scale regeneration resulted in a national urban regeneration policy. During the '90 the scope of urban regeneration was slowly broadened from bricks towards more social and economic aspects of houses and residents, as building quality was no longer the reason for regeneration. Restructuring and livability became the key words in this period. Various programs and legislative framework for urban renewal and restructuring on national level were executed. During the late 90's the national government does no longer wants to finance this topic merely themselves. They expect collaboration with businesses in Public-Private Partnerships. Therefore social housing association become semi-public, more independent, self-responsible and market oriented. The (national) governmental interference on this topic and spatial planning in general, decreases further at the beginning of this century. The national government does not longer actively dictates the course or executes a national program on urban planning or urban regeneration. The government intends to bring spatial planning decision-making closer to the stakeholders (individuals and companies), delegating more to local and provincial authorities (decentralization as the first option), and focusing more on users. Thereby the topic of urban regeneration as a policy domain is nowadays almost disappeared.

2.3.1 National

2.3.1.1 NL Energy Efficiency at National Level

Regulation Title	Website
Energy agreement (2013)	https://www.ser.nl/en/publications/publications/2013/energy-agreement-sustainable-growth.aspx
Dutch Building Code (2012)	https://www.rijksoverheid.nl/onderwerpen/bouwregelgeving/inhoud/bouwbesluit-2012
Energy Label of Dwellings	http://www.energielabel.nl www.verbeteruwhuis.nl
Housing Act	http://www.rijksoverheid.nl/onderwerpen/woningmarkt/woonakkoord

Table 5 Dutch EE legislation

Energy agreement - “Energieakkoord voor duurzame groei”, SER (2013)

The Energy agreement between government, public and private partners in the Netherlands, presents an unprecedented ambition which requires all stakeholders to participate and contribute. It builds on reinforcing the economic structure and will mobilize billions of euros investment, from various sectors and domains into Dutch society.

Partners have committed themselves to realize the next goals:

1. Establish a reduction of final energy consumption on average with 1,5% annually,
2. 100 PetaJoule energy reduction of final energy consumption of the Netherlands, per 2020,
3. Increase the share of renewable energy production from 4% (2013) to 14% in 2020,
4. A further increase of renewable energy production to 16% in 2023, and;
5. Generate at least 15.000 full time jobs for making this happen.

1st and 3rd pillar out of ten pillars of the agreement apply to the FosterREG issues:

- Energy Efficiency (reduction of the need for energy) _in the built environment
- Decentralized energy production

Energy Efficiency is strongly related to houses, both the rental sector as well as the owner occupied share. For effective targeting the home owners and rental sector requires a pro-active role of municipalities.

Overall objective is to establish an energy neutral built environment in 2050, that reduces the carbon emissions tremendously, next to operations costs and stimulates the employment in construction and installations sector. It requires the participation of home owners and tenants, to realize energy efficiency in combination with decentralized renewable energy production. For enabling the overall objective most effectively, the 3 steps of the TRIAS ENERGETICS are recommended:

1. Reduction of prime energy demand
2. Use of renewable energy
3. Cover remaining demand with use of fossil fuels as efficient as possible

The agreement calls in for an average energy label A for dwellings by 2030. According to EPBD new constructed dwellings should reach nearly energy neutral already by 2020, so the main challenge is identified in existing housing stock.

The pillar of decentralized energy production should provide a third of the total amount of sustainable energy production in 2023. A minimum of 1 million households and/or SME's should produce a substantial part of their energy demand themselves in 2020. Solar power, solar heat and heat and cold storage should provide 40PJ. The major part should come from bio energy application. To achieve these goals financial and non-financial aspects are identified where the partners will collaborate to find solutions.

As a consequence, the partners have agreed to reach the aims from EU: EED, the EPBD and the Ecodesign principle. It further more requires for the existing housing stock to: improve 300.000 houses by at least two energy label steps up, per year.

Building regulation (2012)

Building regulation in the Netherlands is divided into regulation for new buildings and regulation for existing buildings. Part of the **Dutch Building Code (2013)** is a mandatory performance-based code that requires an energy calculation to establish the maximum allowed Energy Performance Coefficient (EPC) for new residential and new non-residential buildings. The code addresses most thermal envelope requirements and energy-using systems within the EPC calculation, including, HVAC, hot water, lighting, bioclimatic design and renewable energy. Prescriptive energy efficiency requirements for new buildings are required since the 1970's. However, since 1995 the energy performance values were introduced. In 2012 the code and related national policies have been further strengthened to include, mandatory computer modeling for all new buildings, air-tightness requirements for all new dwellings, thermal bridging linear value requirements, robust pre-occupancy commissioning and a national target to be energy-neutral by 2020. Regulation regarding renovation and/or retrofitting of houses depends on the scale. Major renovations are subject of the Dutch Building Code and thereby strict performance-based EPC code. Smaller renovation only requires a building permit from the municipality which is already called **Environmental Permit** as it becomes part of the new Dutch Environment & Planning Act 2018. Some small renovations or retrofitting, such as putting solar panels on your roof, do not need any permit.

Energy label of dwellings

In the beginning of 2015 all five million dwelling owners received a temporary energy label from the federal government. The label is based on among others, on year of construction and is intended to stimulate thinking about opportunities for realizing a more comfortable and energy efficient dwelling. At the moment of sale of the dwelling, or upon renewal of the lease contract, the temporary energy efficiency label must have been finalized (turned into a definitive one). This 'finalization' process is relatively simple and can be operated completely online. In case an officially 'finalized' label is lacking at the moment of sale /renewal of the lease contract, the seller or owner can be fined for up to € 405.



Figure 1 Picture used in the energy label campaign showing the drive towards more energy efficient houses

Housing Agreement

The aims of this agreement are among others to stimulate employment in construction and improve energy efficiency in the residential housing sector. Relevant measures related to energy efficiency measure are a lowering of the VAT from 21% to 6% on construction activities for e.g. insulation. Moreover, a €150 mill revolving fund for energy saving measures was introduced, which is expected to quadruple with the help of the market.

2.3.1.2 NL Urban regeneration at National Level

Regulation Title	Website
Dutch Environment & Planning Act 2018	https://www.government.nl/topics/spatial-planning-and-infrastructure/contents/revision-of-environment-planning-laws
National Policy Strategy for Infrastructure and Spatial Planning 2012	https://www.government.nl/documents/publications/2013/07/24/summary-national-policy-strategy-for-infrastructure-and-spatial-planning

Table 6 Dutch Urban and land legislation

Dutch Environment & Planning Act 2018

With the new Dutch Environment & Planning Act (Omgevingswet) that will be into force in 2018, the government wants to combine and simplify the regulations for planning projects. The legislations and regulations have become too complex to work with. Over the recent years, the Act will replace 15 existing laws, including the Water Act, the Crisis & Recovery Act and the Spatial Planning Act. The provisions of eight other laws will be transferred to the Environment & Planning Act. The new act will consist of five core instruments:

- Environmental & planning vision - a coherent and strategic plan for the environment.
- Plan or program - policies and measures to achieve environment values or goals and/or continue to meet them.
- Decentralized regulation - the municipal environment & building and planning plan, the Water Regulation and the provincial environment & planning regulation with general rules and license obligations
- General state regulation for activities within environment.
- Environmental permit – one single application at one 'shop' for all activities that the initiator wants to perform.
- A project decision - fast and improved general regulation on decision-making in case of projects with public interest

Next to simplifying, the Act should be better fit the dynamics and developments of this moment and the future. Therefore two key elements are included in the new Act; integrity and participation. Integrity means that the Act and the Environmental & Planning vision which is part of it, relates to all areas of the physical environment, such as traffic and transportation, buildings, water, environment, nature, use of natural resources, agriculture and cultural heritage. Participation is incorporated in various ways. Government agencies should incorporate in their Environmental & Planning visions and plan how citizens, businesses, other public bodies and corporate social organizations are involved. Each government level must establish an Environmental & Planning visions. Participation is mandatory for a project decision, one of the six core instruments in the new law. This should, among others, result in integrity between different sectoral projects and activities, and space for private initiatives. The new Act will result in fewer regulations; reduce the burden of conducting studies, better alignment with EU rules and more room for administrative deliberation. Nowadays, some municipalities have over 100 land-use plans. A single environmental plan for the entire area will replace all of these, meaning fewer regulations and more cohesion. At the same time, decisions on projects and activities can be made better and more quickly. For example, if citizens or companies want to implement a project, they can apply for a (digital) permit at a 'one-stop-shop'.

National Policy Strategy for Infrastructure and Spatial Planning 2012

Making the Netherlands more competitive, accessible, liveable and safe is what the central government wants to achieve and describes in the National Policy Strategy for Infrastructure and Spatial Planning. Urban regions are specified as the areas where economic development and innovation is concentrated. This is one of the reasons causing greater differentiation in spatial development at regional level. Growth, stagnation and decline may occur simultaneously within regions. This increasing regional difference impact on urbanization processes. Therefore, the initiative on restructuring, transformation, urban and rural development is deposited at decentralized level at provinces and municipalities. The programming of housing, industrial estates and offices is deposited at regional level.

2.3.2 Regional

A brief context of the province of Utrecht

Utrecht is one of the twelve provinces of the Netherlands. The province is currently repositioning itself after the provincial elections in March 2015. The previous government wanted sustainability to become an integral part of all their policy and plans, which meant that the responsibility for sustainable development was not assigned to anyone in particular and only modest progression was made. This new government has made its sustainability intentions much more explicit, and the province is still working out the details. The province is an active partner for the municipalities in the spatial planning domain and oversees regional development (i.e. ensuring a diverse housing stock matching the demographic demand throughout the province), as well as large scale renewable energy projects such as wind farms and biomass. They work as a grease agent when a project runs into difficulties (in process, such as cooperation with other government layers, or financially, to help finish the project). Within the Netherlands the financial situation of provincial governments vary considerably. In comparison to other provincial governments, the province of Utrecht is one of those provinces that didn't make large profits by selling their interest in what used to be their regional energy company.

This is one of the reasons, their energy efficiency and renewable energy policy is mainly focused on foster innovation instead of projects about the implementation of current technologies. In (Source: interview August 2015)

2.3.2.1 NL Energy Efficiency at Regional Level

Regulation Title	Website
Utrecht 2040	https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/duurzaamheid/strategie-utrecht/
Province of Utrecht – Agenda Sustainable Energy	Not available yet

Table 7 Province of Utrecht legislation

Utrecht 2040

The province of Utrecht aims to be climate neutral in 2040. For sustainability, the province aims at the following four pillars:

1. Sustainable business conduct by the Province itself (i.e. waste, water, paper, energy use, mobility, catering, and sustainable purchasing/role of launching customer)
2. Iconic projects, such as smart grid projects
3. Sustainable policy development
4. Involving the local community/networks

Each plan or policy document is required to have a sustainability paragraph, indicating its (positive or negative) impacts. Examples include the energy efficiency measures used contributing to lower CO₂-emissions, or a reduction of noise pollution.

Iconic projects are those projects where sustainability and innovation are closely intertwined. Examples of innovation are innovative procurement processes, being innovative with the means provided, applying new measuring or monitoring systems, or the development of a smart grid.

Province of Utrecht –Sustainable Energy Agenda

The province of Utrecht is currently developing an Energy transition program named 'Agenda Sustainable Energy'. Their ambition is having .000 'zero-energy-houses' in the region by 2020. The Municipality of Utrecht is working with the Economic Board Utrecht and the housing association in order to realize the first pilots in Utrecht.

This program should reflect the ambition of the new coalition to incite action for the implementation of sustainable development focusing on energy efficiency, renewable energy generation and knowledge sharing. Further information about this program is at this moment not available yet.

2.3.2.2 NL Urban regeneration at Regional Level

Regulation Title	Website
Province Spatial Structure Vision Utrecht 2013-2028 & Framework document Housing & Urban Development	https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/provinciale-0/
Province Spatial Regulation 2013 & Red contours	https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/provinciale-0/

Table 8 Province of Utrecht Urban and land legislation

Province Spatial Structure Vision Utrecht 2013-2028 & Framework document Housing & Urban Development

The Structural Vision is a policy document compiled by the Province of Utrecht about the spatial structure strategy for the area of the Province of Utrecht. It describes the spatial planning goals and ambitions which the Province of Utrecht wants to reach together with their partners. Each province in the Netherlands develops a spatial structure strategy that is aligned with the national spatial strategy. The vision is approved by the Provincial State. The Framework document Housing & Urban Development specifies the ambition and goals of the Province regarding housing and urban development. The Province of Utrecht aspires that 2/3 of the housing program should be realized within urban areas of the Province to reduce the pressure on rural areas. Reducing the surplus of offices and restructuring of industrial estates are key aspects of the urban challenge as well.

Province Spatial Regulation 2013 & Red contours

Part of the Spatial Structural Vision is the Province Planning Regulations for municipalities regarding zoning, urban and rural development, housing, environmental and cultural history aspects. The Red Contours which is part of this set, pinpoints exactly the boundaries of urban areas within the Province. Together with the Housing & Urban Development goals and ambitions the Province shapes the framework of the urban housing development and/or regeneration task of municipalities.

At this moment, energy efficiency is only included in these regulations regarding the pinpointing of wind turbine and biomass locations. However, the Province is currently busy to integrate energy and energy transition topics within their spatial and housing programs.

2.3.3 Local

A brief context of Utrecht

The city of Utrecht is the capital of the province Utrecht and the fourth-largest (G4) city of the Netherlands. The Municipality of Utrecht contains 335.000 inhabitants in 171.041 households in 147.512 houses divided over 10 districts.

About 50% of the houses are owner-occupied, almost 40% owned by the 5 local semi-public housing associations and 13% is owned by private investors. This group includes owners of apartments which are part of an association of homeowners (VVE).

Utrecht is one of fast growing cities in The Netherlands with an annual construction of 1.500-3.000 houses/yr. However, the average age of the houses in Utrecht is 50 years, and two third of the houses are built before 1980.

New construction projects on large scale are almost completed in Utrecht with the building of the District of Leidsche Rijn. Focus is nowadays on small-scale new construction within the city borders and renovation of buildings of housing corporations.

On average a household in Utrecht uses 2.650 kWh and 1.000 m³ gas/yr. That is lower than average in The Netherlands. 40.000 households use the central district heating. Together they use 1.700.000 GJ/yr. That is 1 GJ per household per year. That use is higher than the national average.

The role of municipalities has changed in the last decade from a leading/executing role into a more facilitating role. The national government reduced the budgets of municipalities, although responsibilities, tasks and pressure on large cities went up. This new role related to this subject means fostering and facilitating initiatives in different ways, creating awareness and helping to remove barriers. Participation of inhabitants in developing an shared energy transition plan fits with this new role.

2.3.3.1 NL Energy Efficiency at Local Level

Regulation Title	Website
Government agreement 2014-2018 (Collegeakkoord)	http://www.utrecht.nl/college-van-b-en-w/coalitieakkoord-2014-2018/
Energyplan 2016-2020 (Energieplan)	http://www.utrecht.nl/utrechtse-energie/stadsgesprek-energie/
Energy Program 2010-2015 (Programma Utrechtse Energie)	http://www.utrecht.nl/fileadmin/uploads/documenten/3.ruimtelijk-ontwikkeling/Milieu/uitvoeringsprogramma_Utrechtse_Energie_2015.pdf

Table 9 Utrecht EE legislation

Government agreement 2014-2018 (Collegeakkoord)

Related to sustainability the Government agreement aims the efficient use of energy, raw materials and establishing closed-loop life cycles. Goals are energy savings and productions, CO₂ reduction and sustainable employment. In 2030 Utrecht should be energy neutral, resulting in energy savings, employment for residents, business opportunities and a healthy environment and climate. The Municipality strives to strengthen the effect of investment with the help of co-financing, creating a multiplier in ecological and economic effects.

- The Energy program of Utrecht receives a budget of 3 million euro within the period of 2015-2018. A more structural budget after that is guaranteed.
- The use and distribution of the budget and (revolving) funds will be done in consultation with residents, investors, banks and business.
- The Municipality encourages and supports sustainable initiatives residents and will tempt individuals and private parties to invest in sustainability in Utrecht. The budget is not intended for operating grants and direct grant of ' hardware ', insulation, solar cells etc.

- Utrecht has set an intermediate target of 30% energy savings and at least 20% sustainable energy production within the borders of the city of Utrecht by 2020. In reaching those goals they will make plans about large scale sustainable energy production together with resident (associations), companies and knowledge and educational organizations.
- The municipality wants to learn from other projects and previous experiences about locations for wind turbines. Important aspects are decentralized energy production goals and support of local citizens.
- Better use of (waste)heat and sustainable heat will be included in the energy plan, including support, involvement and participation.
- The Municipality of Utrecht will give the right example by focusing on sustainability regarding procurement and tendering.
- The Municipality is committed towards the National Energy Agreement and will translate those goals into concrete actions of dwellings that will be renovated by housing associations.
- High sustainability standard will be set towards new buildings and renovation. This agreement must lead to energy savings, higher quality of houses with lower costs.
- The municipality aims to make a giant step regarding the improvement of the energy efficiency of houses from private home owners. Improving the guarantees regarding investments are an important aspects which will be investigated to convince private home owners to take action.
- The municipality will actively promote the installation of solar panels in order to reach the goal that 10% of roofs of houses, companies, apartment blocks including municipal roofs, are covered. They will encourage resident and neighborhood initiatives.

Energy plan Utrecht 2016-2020 (Energieplan Utrecht)

The ambition of Utrecht is stated in their plan for the transition to sustainable energy "Utrecht, energiek middelpunt van het land"- Energieplan Utrecht". This plan has been created by an innovative approach: 165 Utrechters, which were selected through a random draw, created together an energy plan during three town energy meetings. By this particular approach makes Utrecht is nominated for the EUROCITIES Award 2015 in the category ' participation '. The focus of this energy plan is to cooperate with parties in the city of Utrecht. The Municipality has been looking for shared visions and interests to establish a common agenda to realize those common goals. Important aspects are joint ownership, systematic approach and clear final results. Cooperation partners are energy users (property owners and tenants), suppliers of products, services and intermediaries (for example, mortgage lenders and brokers), infrastructure partners, other public authorities, knowledge and educational institutions, and leaders from local initiatives on neighborhood and company level.

The results that Utrecht will reach over four years (2016-2020) are:

- Every household and business will know there energy consumption-
- 50.000 active energy-saving measures have been taken
- Houses connected to district heating have an energy label B and all others on energy label A or A+.
- 15.000 number of Zero energy houses
- All newly build houses should be build energy neutral
- Large and active network of energy ambassadors, also in companies and schools

- Municipality supports local initiatives by a sustainable initiatives Fund
- 10% of all roofs have solar panels
- Financial products available for large-scale renovation
- Medium and small business are aware of all the financial possibilities related to energy efficiency.
- In case of sale or renovation, advisory meeting about opportunities for energy efficiency are held.
- Boosting storage capacity and for example electric shared cars
- At least one solar field has been realized within the city.
- A plan for phasing out of the gas infrastructure.
- A plan to improve the district heating in terms of service, price, product, sustainability and incentives for energy saving

The energy plan is not yet translated into projects.

Energyplan 2010-2020 (Energieplan)

Programma Utrechtse Energie 2011-2015/sub program Energy efficient housing, containing the following projects:

- o Heatscans and energy labels
- o Energy-ambassadors
- o Personalized energy consults
- o Information meetings
- o First step: together with neighbors
- o Organizing the supply side
- o Financing: energy-loan
- o Special focus: solar city

The projects are explained in paragraph 3.3.3.1 and 4.3.2.

The energy program is evaluated in 2015. The main conclusion is that the program has been effective:

- More attention to energy saving and sustainable energy generation at both residents and businesses resulted in more investment
- Strong growth in use of solar panels compared to the other three major cities in the Netherlands (G4)
- Housing corporations have saved more than agreed with the municipality of Utrecht
- CO2 emissions decreased by 9% per inhabitant
- Renewable energy grew to around 1%
- Financial instruments have a varying effect: the energy fund Utrecht for companies is successful, the sustainability loan is unknown and unattractive.
- The program has reached less private landlords than intended
- There are fewer large-scale sustainable energy production facilities (wind and biomass) realized than intended.

2.3.3.2 NL Urban regeneration at Local Level

Regulation for urban regeneration is in force as described on national level as described in the Dutch Environment & Planning Act 2018 paragraph 2.3.1.2 NL Urban regeneration at National Level

2.4 Croatia

The first requirements relating to energy economy and heat retention for buildings were set by a regulation in 1970, which defined the requirements for the building envelope. Requirements were put regarding the specific thermal losses and the maximum permitted thermal transmittance values for building elements. The last improvement of these requirements took place in 1987.

The country report of Croatia⁸ describes, that the implementation of the EPBD in Croatia started in 2005. In order to comply with the EPBD, new requirements on buildings were set, which included a maximum permitted annual energy use for heating, as well as new higher restrictions on thermal transmittance values for building elements. Since the amendments of the Energy Efficiency Act in May 2012, the implementation of the EPBD has come in its entirety into the responsibility of the Ministry of Construction and Physical Planning.

The Physical Planning and Building Act, published in the Official Gazette No. 76/2007, laid the legal basis for the adoption of the implementation regulations regarding the application of the **minimum Energy Performance requirements** for new buildings and building components, as well as for existing buildings and building components that are subject to renovation.

The Energy Efficiency Act, published in the Official Gazette No 152/2008, laid the legal basis for the adoption of the implementation ordinances regarding the application of other requirements of the Directive: the obligations for **issuing Energy Performance Certificates** (EPC), and for the **inspection of heating and air-conditioning** systems, as well as the obligations for establishing an independent control system.

2.4.1 National

By joining the European Union on 1 July 2013, the Republic of Croatia, together with other Member States, on the basis of EED, undertook to increase energy efficiency in the EU in order to meet the goal of saving 20 percent of primary energy consumption in the European Union by 2020 compared to projections (compared to business-as-usual or baseline energy consumption).

Legal framework for energy efficiency sector in Croatia is defined through the package of energy laws that consist of the following primary legislation:

- Energy Act
- Act on construction

⁸ ⁸ Nada Marđetko Škoro, Ministry of Construction and Physical Planning: EPBD implementation in Croatia, Status at the end of 2012

- Act on heat energy market
- Act on Regulation of Energy Activities

Act on Energy efficiency (AEE) (OG No. 127/14) is the basic regulation laying down the obligations related to energy management, especially in the public sector and by large energy consumers. The enforcement of AEE is based on a series of subordinate pieces of legislation, some of which are still in the process of being adopted. This Act supports ESCO market – providing energy services in the sense of energy efficiency improvement measures. Furthermore, the Act prescribes distribution of responsibilities between Ministry of Economy (ME), Ministry of Construction and Physical Planning (MoCPP) and the Environmental Protection and Energy Efficiency Fund (EPEEF).

It is a law regulating the area of efficient energy use, adoption of plans at the local, regional (regional) and national level for energy efficiency improvements and their implementation, energy efficiency measures, energy efficiency obligations, the obligations of a regulatory body for energy, transmission and distribution system and energy market in connection with the transfer or the transport and distribution of energy, commitment power distributor, supplier of energy and / or water, especially energy service, determine the energy savings and consumer rights in the implementation of energy efficiency measures. In addition, it is in the Croatian legislation transposing the EU Directive 2012/27 / EC on energy efficiency.

As such, AEE determines roles of APN, ways of implementation of NEEAPs and other key legal conditions for energy efficiency in urban regeneration. Articles 29 and 30 also prescribes conditions for agreements on the energy performance of the apartment buildings and contracts or the energy regeneration of the apartment buildings. Details on NEEAPs, roles of APN and National Coordinating Body are given below.

Moreover, the obligation of submitting data on final energy consumption for suppliers and customers was thus far based on the planned rules on the single energy efficiency information system, which proved to greatly overlap with the issues regulated by the Rules on energy balance, and it was more advisable to improve the data collection process defined by the latter Rules than develop a parallel system for data collection and processing.

Pursuant to the 2nd National Energy Efficiency Action Plan (NEEAP), adopted by the Government of the Republic of Croatia on 14 February 2013, the Centre for Monitoring Business Activities in the Energy Sector and Investments was appointed as the National Coordinating and Implementing Body for Energy Efficiency. The 2nd NEEAP entrusted the National Coordinating Body for Energy Efficiency (CEI) with the implementation activities for certain measures, the coordination of the implementation of all measures implemented by other institutions and companies, and the management of the information system for monitoring and verifying achieved energy savings. In addition to strengthening the overall institutional framework for the implementation of the NEEAP, this also contributes to a more effective method of monitoring and reporting achieved energy savings. This has made CEI the central authority which will possess the information on all energy efficiency activities in the Republic of Croatia, and will have a database of achieved savings which is the key tool for reporting and defining a new cycle of measures necessary for the achievement of the national energy savings target.

The tasks of the National Coordinating Body are:

1. CEI manages the SMIV – the system for monitoring, measuring and verifying energy savings;
2. CEI acts as the central authority which collects data, analyses and reports on achieved energy savings in all energy consumption sectors at national level;
3. CEI prepares the foundations for drawing up national documents and plans on energy efficiency;
4. Launches and runs information campaigns, education and training activities;
5. Implements activities aimed at achieving energy policy targets in the field of EE and renewable energy sources (RES)
6. Prepares and implements projects for the absorption of funding from EU funds, and provides expert assistance in the development and implementation of EE and RES projects;
7. Provides expert assistance and cooperates with MEand MoCPP in the adoption of legislation and implementing regulations, programmes and plans;
8. Encourages and coordinates the activities of central state administration bodies, Environmental protection and energy efficiency fund (EPEEF), Energy Institute HrvojePozar (EIHP), local and regional energy agencies;
9. Cooperates with international organisations, especially EU organisations and professional networks within the EU.

In other words, CEI is assigned the activities which would fall under the competence of an **energy efficiency agency**, and that will contribute to strengthening the institutional framework for the implementation and monitoring of the third and all the following NEEAPs. In that sense, in the majority of the measures in the 3rd NEEAP, the Centre is specified as the body with which all the other **implementing institutions and companies must coordinate their activities**. Furthermore, all the other institutions and companies that implement energy efficiency improvement activities and measures defined in the 3rd NEEAP are obliged to report to the CEI in regard to those activities. This will make the Centre the central authority which will possess the information on all energy efficiency activities in Croatia, and will have a database of achieved savings (SMIV – Energy Savings Measuring and Verification System) which is the key tool for reporting and defining a new cycle of measures necessary for the achievement of the national energy savings target. In that regard, CEI was conferred the authority to request all other institutions and companies to submit the data necessary for the evaluation of achieved energy savings. Other institutions and companies also have the duty to implement certain measures from this NEEAP, as specified under each measure. Substantial efforts of Local self-government units (LRSGUs) and regional energy and development agencies are expected primarily in regard to fostering energy efficiency in households. A clear distribution of responsibilities and direction of activities will facilitate much better cooperation and coordination of key institutions – ME, MoCPP, MENP, other ministries, EIHP, EPEEF, and other institutions and companies – under the leadership of the Centre.

The Directorate for Climate Activities, Sustainable Development and Protection of Soil, Air and Sea was established within MENP, in accordance with the Decree on the internal organization of the Ministry of Environmental and Nature Protection(MENP) (NN No 10/14), and within its scope of activities the Directorate connects environmental protection policy with renewable sources and energy efficiency. The Sector for Climate Activities and Sustainable Development was established within the Directorate, to implement the active policy on sustainable development, and especially to propose measures and projects for

the sustainable development of the Republic of Croatia and foster the use of renewable energy sources, the application of energy efficiency measures, cleaner production, cleaner transport, and green industries. MENP, therefore, participates in the creation and implementation of strategic, legislative and implementing documents on energy efficiency and acts as the body which approves implements and monitors the implementation of all NEEAP measures directly and indirectly related to environmental protection.

As the state administration body competent for environmental protection, MENP is the coordinator for the Policy Framework for Climate and Energy for the 2020–2030 period, the competent authority for drafting the Low Carbon Development Strategy of the Republic of Croatia by 2030, and the competent authority for programming EU funds in regard to planning the transformation of the economy into low carbon development with the application of new, green technologies and innovations. MENP is focused on creating the preconditions for achieving the strategic and development objectives of the European Union and the Republic of Croatia for the reduction of greenhouse gas emissions, increasing the share of renewable energy sources and energy savings by 2020, by way of developing financial mechanisms, primarily via the Fund as the key implementing authority.

The 3rd NEEAP plans for the launch and implementation of complex programmes, which will not yield the required results without an appropriate institution to coordinate and verify the results.

Since 2013, but also in the 2011–2013 period, the National Coordinating Body for Energy Efficiency (CEI), as the central national authority, has been performing BU calculations for all projects, measures and sectors in which energy savings are achieved, drawing up the National Report on Energy Efficiency Implementation and preparing the national energy efficiency action plans.

This process of monitoring projects and savings calculations must be continuously improved in order to obtain the best possible data on the achieved effects. The development of the National Energy Savings Measuring and Verification System (SMIV) was started with that aim, run by the CEI in cooperation with GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH), the German Agency for International Cooperation. SMIV will greatly facilitate the monitoring of energy efficiency policy implementation and the drafting of the annual implementation reports. It is, therefore, very important to continuously improve and develop this system. It is proposed that, in the future period, emphasis be put on SMIV as the central national database which stores the main information on the measures, plans, programmes, and projects that are used to implement the national energy efficiency policy.

2.4.1.1 HR Energy Efficiency at National Level

Regulation	Title	Website
OG 69/06	Technical regulation for windows and doors	http://www.mgipu.hr/doc/odluka_o_popisu_normi_06102006.pdf
OG 03/07	Technical regulation for chimneys in construction works	http://narodne-novine.nn.hr/clanci/sluzbeni/296637.html
OG 110/08	Technical regulation on heating and cooling systems in buildings	http://narodne-novine.nn.hr/clanci/sluzbeni/34177

		4.html
OG 03/07	the technical regulation on ventilation systems, partial air-conditioning and air-conditioning of buildings	http://narodne-novine.nn.hr/clanci/sluzbeni/296637.html
OG Nos 150/14, 48/14.	energy audits and energy certification of buildings	http://narodne-novine.nn.hr/clanci/sluzbeni/2014_12_150_2803.html

Table 10 Croatian National EE legislation

Regarding the implementation of the recast EPBD, the energy performance of a building – including numeric indicator of primary energy – has to be set. Building in compliance with the new rules brings significant reduction in the energy consumption (at least 30%) for space heating in the housing sector, and an average of about 50%, compared to the period before the implementation of the Directive. New savings that are planned for the future are expected to bring an additional reduction of 20% in the final energy consumption for space heating in the housing sector. The energy standard for Nearly Zero-Energy Buildings (NZEB) includes further reductions of the energy consumption, and establishes the minimum requirements of renewable sources. It is assumed that the final energy demand for heating in the housing sector until 2021 could be decreased by an additional 40%.

In order to reach the energy efficiency goals, the regulation imposes limits on the following items:

- Maximum permitted annual energy use for heating per m² of usable floor area of a building, or per m³ of a heated part of a building.
- Maximum permitted transmission heat transfer coefficient per m² of a heated part of the building.
- Prevention of overheating due to solar radiation during summer.
- Limitation of the air-tightness of the building envelope.
- Maximum allowed heat transmission coefficients U of building components of new buildings, small buildings and after renovation works performed on existing buildings.
- Minimization of the impact of thermal bridges.
- Maximum permitted water vapour condensation inside a building component.
- Prevention of surface condensation of water vapour.

The application for a building permit for a new building and for the improvement of the energy performance of an existing building with a useable floor area over 1,000 m², in case of a major renovation, shall be accompanied by a study of technical, environmental and economic feasibility of alternative systems for electricity supply, especially decentralized energy supply systems based on renewable energy sources, cogeneration systems, long distance or block heating systems containing heat pumps.

The EPBD requirements relating to the setting of **minimum energy efficiency requirements** for new buildings and for existing buildings undergoing renovation have been transposed in the national law through several technical regulations:

- The technical regulation on energy economy and heat retention in buildings is a basic technical regulation directly transposing the EPBD requirements, as well as

setting a requirement with regard to the maximum annual specific heat consumption for heating.

- The use of alternative energy supply systems is promoted through the obligation to develop technical, economic and ecological feasibility studies for alternative energy supply systems. This study must be a part of the main design when submitting the application for obtaining the building permit.

Regulations indirectly transposing the EPBD requirements are:

- the technical regulation for windows and doors (OG 69/06);
- the technical regulation for chimneys in construction works (OG 03/07);
- the technical regulation on heating and cooling systems in buildings (OG 110/08);
- the technical regulation on ventilation systems, partial air-conditioning and air-conditioning of buildings (OG 03/07).

The **energy certification** of buildings started in 2010, when also the authorization to issue EPCs was granted to the first natural and legal persons.

The energy audit and the energy certification of a building are conducted by a legal or natural person who is authorised by the Ministry of Construction and Physical Planning pursuant to the Rules on the conditions and criteria for persons conducting energy audits and energy certification of buildings (NN Nos 81/12, 64/13).

Construction Act (NN No 135/13) and the Act on Efficient Energy Use in Final Consumption (AEEU) (NN No. 127/14):

The rules based on these two Acts lay down the following

- the method and conditions for conducting energy audits of buildings and regular audits of heating and cooling or air-conditioning systems in buildings;
- The contents of reports on such audits, the energy certification method;
- The contents and appearance of the energy performance certificate;
- Low energy buildings;
- the method and conditions for conducting independent controls of energy performance certificates and reports on regular audits of heating and cooling or air-conditioning systems in buildings;
- The contents and implementation method of Module 1 and Module 2 vocational training programs;
- Vocational training and mandatory advanced training tests for authorized persons;
- Contents of the register and other issues related to conducting energy audits, energy certification of buildings;
- Independent controls of energy audit reports and energy performance certificates.

The soundness of an energy performance certificate is achieved through independent control, as laid down in Article 39 of the Construction Act pursuant to which every energy performance certificate is subject to independent control. There are legal entities authorized to conduct such control in Croatia, and the control is conducted at the direction of MCPP. If the independent control negatively evaluates an energy performance

certificate, MCPP will declare such a certificate invalid, and the authorized person whose certificates have been declared invalid will have their authorisation revoked.

In order to ensure the implementation of mandatory building certification, the Construction Act lays down penal provisions for legal or natural persons who, as owners of a building or a part thereof, fail to obtain an energy performance certificate.

The register of legal and natural persons authorised to perform energy audits and energy certification of buildings, as well as other information for citizens, has been published at the MCPP website which is regularly updated with new replies to the citizens' queries.

The obligation of the energy certification of buildings is laid down for new buildings prior to their use, existing buildings being sold, rented or leased, and buildings used for public functions. The display of energy certificates of buildings with public functions, with usable floor area above 1,000 m², is required since the 31st of December 2012. For buildings with usable floor area above 500 m², the display obligation starts from the 31st of December 2013. For buildings with usable floor area over 250 m², it starts from the 31st of December 2015.

The energy certification of buildings started in 2010. Since then, and up to January 2013, more than 5,000 energy certificates have been issued, of which 60% for residential buildings and about 40% for non-residential buildings. The buildings are classified into eight energy classes, from A+ to G. The obligation of informing the buyer of a building about its energy certificate came into force only on the date of the accession of the Republic of Croatia to the European Union (1 July 2013). The maximum prices for the development of energy certificates of buildings are established by a Ministerial Decision. The conditions and criteria for persons performing energy audits and energy certification of buildings are prescribed by the Ordinance OG 81/12. The authorization requires education (university studies of engineering in the field of architecture, civil engineering, mechanical engineering or electrical engineering), at least five years of professional working experience, successful completion of the Training Programme (pass an examination), as well as professional liability insurance against any potential damage. The validity of the authorization is 3 years. The validity of energy certificates is 10 years.

It is important that the requirements of building energy performance are supporting the achievement of **the nearly zero energy buildings** (NZEB). NZEB shall refer to high energy efficiency buildings, and the share of renewable sources shall be defined in line with the national energy strategy. The envisaged national definition of NZEB is under elaboration, but it shall enable clear and simple implementation, and shall be adapted to buildings in accordance with their designated function. The action plan for progression to NZEB was expected to be developed by the end of 2013. It was in the end developed in 2014.

Based on the Energy Efficiency Master Plan, National Energy Efficiency Programme 2008-2016 was prepared as well as the 1st National Energy Efficiency Action Plan 2008-2010, which are in line with requirements of the ESD (Energy Services Directive).

Amendments to the Act removed unnecessary barriers for providers of energy services and, the entry into force of amendments to the Law on the efficient use of energy in the final energy consumption (Official Gazette 101/2013) enabled the natural or legal person

under the agreement on energy performance to provide the service or other measures to improve energy efficiency. Also, the amendments to the Law on the efficient use of energy in the final consumption appoint Agency for Transactions and Mediation in Immovable Properties (APN) to, in the name and for the account of budgetary and extra-budgetary users of the state budget, carry out the procedure of public procurement of energy services. Other public sector entities (local and territorial (regional) self-governments) must authorize the APN to manage, on their behalf, the procurement procedures for energy services. The Croatian Government has adopted the Regulation on the negotiation and implementation of energy services in the public sector (Official Gazette No. 69/2012). In accordance with the Regulation, energy services provider undertakes to provide energy services to the client by applying measures to improve energy efficiency, while the latter undertakes to provide the payment to service provider, where the payment is based on realized and verified savings, in the way described in detail by the treaty on energy performance. Regulation on the negotiation and implementation of energy services in the public sector (Official Gazette 69/2012, article 16) prescribes the manner of a financial booking of energy services, in such a way that the contracting of energy services for the client under the contract on energy performance is not a budgetary debt.

There are two main legal acts which regulate electricity production from renewable energy sources (RES) and high efficient cogeneration (combined heat and power CHP) in Croatia:

- The Energy Act (Official Gazette nr. 68/01, 76/07 and 177/04)
- The Electricity Market Act (Official Gazette nr. 76/07 and 177/04)

The Energy Act explicitly states that the usage of RES and CHP is of Croatian national interest. It defines eligible producer as an energy undertaking which produces electricity and heat in a CHP plant, uses waste or RES in economically viable manner in compliance with environmental protection. The Energy Act also stipulates that all issues related to usage of RES and CHP are covered by special ordinance. The Ordinance on Use of Renewable energy sources and Cogeneration (Official Gazette nr. 67/07) determines conditions for usage of RES and CHP and defines groups of RES and CHP plants. It lays down conditions for inscription in the Register of RES and CHP Projects and Plants and Eligible Producers (EP) and prescribes all steps which energy undertaking is obliged to perform in order to obtain Preliminary Energy Approval and Energy Approval for construction of the new plant Ministry of Economy, Labour and Entrepreneurship (MINGOIP) is responsible for administering the Register. The Tariff System for Production of Electricity from Renewable Energy Sources and Cogeneration (Official Gazette nr. 33/07) is based on the Energy Act. Eligible producers are entitled to Incentive price defined in the Tariff System. The Incentive price depends on installed power and type of a plant. Eligible producers consume their right to incentive price based on the Contract on Electricity Purchase, which eligible producers make with the market operator (HROTE).

And finally, the Energy Act stipulates that electricity price contains an incentive fee for promoting electricity production from RES and CHP, which is determined by the Government in the Regulation on Incentive Fees for Promoting Electricity Production from RES and CHP (Official Gazette no 33/07 and 133/07).

Charging and collecting the fee from all electricity consumers started on 1st May 2007. The Regulation determines a unit fee (HRK/kWh), which should be clearly rendered as a separate item in the electricity bills.

According to the Electricity Market Act, transmission or distribution system operators are obliged to take over all electricity produced by eligible producers in accordance with prescribed conditions. Status of eligible producer is acquired by decision of the Croatian Energy Regulatory Agency (HERA) in line with conditions and procedures prescribed in the Ordinance on Acquiring the Status of Eligible Electricity Producer (Official Gazette nr 67/07). Furthermore electricity suppliers are obliged to take over the share of electricity from RES and CHP in proportion to their share, expressed in percentages, in the total electricity supply in the Republic of Croatia, which is, based on the Electricity Market Act, defined in the Regulation on Minimum Share of Electricity Produced from RES and CHP whose production is incentivised (Official Gazette no 33/07). The Regulation lays down national targets of 5.8% of Electricity from RES and 2% of electricity from CHP whose production is incentivised in total electricity consumption in the Republic of Croatia by the end of 2010.

Besides MINGORP and HERA, the key institution for incentivising electricity production from RES and CHP in Croatia is Croatian Energy Market Operator (HROTE). The Electricity Market Act defines HROTEs obligations, which, among other things, include administering contracts with all electricity suppliers to ensure minimum quantity of electricity is produced from RES and CHP, collecting incentives for RES and CHP electricity from suppliers, accounting, and distributing funds from the incentive fees to eligible producers based on concluded contracts.

Transmission and distribution system operators, HEP-OPS and HEP-ODS, are responsible for issues related to the connection of RES and CHP plants to electric power grid.

National Energy Efficiency Action Plan 2011-2013

In February 2013, the Croatian Government (hereinafter: RH) adopted the second National Energy Efficiency Action Plan (hereinafter: NEEAP) for the period 2011 to 2013. This Action Plan was created pursuant to the National Programme of energy efficiency for the period 2008.-2016., and the Energy Development Strategy of the Republic of Croatia (Official Gazette No. 130/2009), in accordance with the obligations set out in the Act on the efficient use of energy in end-use - ZUKE (Official Gazette no. 152/2008 and 55/2012) and Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC. The backbone of the second NEEAP are measures of energy renovation of existing buildings and the Ministry of Construction and Physical Planning has the obligation to prepare **three national energy program of renovation: commercial buildings, public buildings and residential buildings.**

Third National Energy Efficiency Action Plan for the period 2014. – 2016. (hereinafter referred to as the Third National Action Plan) is a continuation of the Second National Action Plan for Energy Efficiency for the period from 2011 to 2013 resulting from the Energy Efficiency Programme of the Republic of Croatia for the period from 2008 to 2016.

The third national action plan meets the requirements of Article 24 of Directive 2012/27/EU on energy efficiency, which requires from the Member States of the European Union triennial submission of plans to the European Commission, containing measures whose implementation will achieve the intended goals of reducing final energy consumption, and thus contribute to achieving the objective of the European Union of 20% reduction in primary energy consumption by 2020 compared to basic (business-as-usual)

scenario. The third national action plan also contains a report on progress in achieving the national goals of increasing energy efficiency, and a report on the implementation of the Second National Action Plan. In addition, the third part of the national action plan meets the reporting requirements of the Directive 2010/31/EC on the energy performance of buildings

2.4.1.2 HR Urban regeneration at National Level

The system of spatial and urban planning in the Republic of Croatia is institutionalized activity at all levels of the Croatian territory (state, county, city and municipality level, as well as the level of smaller settlements) since the middle of 20th century. With regard to urbane, city areas, it should be emphasized that a continuous influx of population in the past caused the process of urbanization, starting from the urban centers towards the periphery. In conditions of industrial development, which caused an expected rise in population, spatial planning was a basis for controlled urbanization, predicting at the same time spatial, qualitative and quantitative capacities of necessary facilities which normally follow development of settlements (such as transport, infrastructure, social and cultural facilities). However, Croatian cities have specific experience of significant post-war consequences. In the last two decades migrations were intensified, which was also a direct consequence of war on the war affected territories. That period cannot be considered as a period of planned urbanization, however there were intensive activities related to preparation of spatial planning documentation, urban areas reconstruction plans, transportation, communal and other infrastructure. Settlements which were created as a result of aforementioned events had, and still partly have, certain evident disadvantages related to infrastructure and other complementary facilities. The process of legalization of illegal parts, where possible, of urban areas is still underway. The end of this process is expected by the end of 2016. The cities invest significant efforts in order to find good use of the former industrial zones. In the Republic of Croatia, integration of economic, social and ecological dimensions is present in urbanization practice since the mid-sixties of the 20th century. Since then, in line with dynamic development of integral planning, local and state level institutions apply, when possible, the best available European and global experiences. Therefore, all newly built structures are compliant to the state-of-the art regulations to provide for energy efficiency, but main issue is with structures built in the 1970.-ies and 80.-ies, which would be main target for urban regeneration.

Croatia also developed Integrated System of Spatial Development (ISSD, Croatian ISPU). Information System of Spatial Development is in line with the Spatial Data Infrastructure Act (which basically transposes the INSPIRE Directive). Enforcing the Ordinance on the ISPU. Improved public participation and accessibility of spatial plans is enabled via ISPU. Easy, quick and free of charge access to public spatial data on all levels of governance. ISSD is introduced through Spatial Planning Act in 2013.

Continuous creation of spatial plans is based on the following principles of spatial planning, which are in line with the Spatial Planning Act: integrated approach to spatial planning, spatial sustainability of development and excellence of construction, realization and protection of public and individual interest, horizontal integration in the protection area, vertical integration, free public access to information and documents relevant to spatial planning.

Efficiency of Physical Planning is ensured by the adoption of spatial plans and other documents, which is prescribed by the Spatial Planning Act. The task of ensuring technical soundness of the plans and the documents belongs to the government bodies, expert administrative bodies, institutes and other legal entities that are registered for activities of spatial planning, as well as authorized architects who independently perform professional tasks of spatial planning, in accordance with their respective roles in the process.

The Act defines the strategic investments of importance for Croatia, and provides for their realization by immediate implementation of the National Spatial Development Plan, which covers all three pillars of sustainable development. Furthermore, cities and municipalities achieve innovation and partnership through a number of innovative projects that affect the urban transformation, and they are often supported by local and foreign partners. The importance of all three pillars of sustainable development is being recognized by all stakeholders involved in the complex process of urban planning and development. But still, there is a lack of understanding connected with urban regeneration that should be addressed through knowledge transfer activities in order to introduce urban regeneration into spatial and urban planning.

2.4.2 Regional

On regional level, counties in Croatia have made their own Action plans for sustainable use of energy, in which state of the art of energy efficiency is discussed and goals in tree year periods are elaborated, as well as measures to be taken in order to reduce energy consumption and promote RES.

2.4.2.1 HR Energy Efficiency at Regional Level

Regulations for energy efficiency and renewable energy sources are in force on regional level as described for national level.

Through **Systematic Energy Management** project (SEM), for which letter of intent has been signed by all ministries (20), Counties and over 100 cities in Croatia, methodology of data collecting and monitoring has been developed. This methodology connects SEM on national level with SEM on building level through the chain of SEM on County level, EE office, EE info points **and Energy Management Information System (EMIS)**. The system collects data on the building level, creating a register, which enables monitoring of consumption and proposition of measures for groups of buildings of the same type.

2.4.2.2 HR Urban regeneration at Regional Level

Regulation for urban regeneration is in force as described above. No specific regulatory framework has been developed for urban regeneration on larger scale, such as on the level of neighbourhood.

2.4.3 Local

Many cities have voluntarily joined the 'Covenant of Mayors', an initiative which encourages European cities to combat climate change by developing Sustainable Energy Action Plans (SEAPs) which are a basis for future implementation of specific projects on energy efficiency and use of renewable energy sources.

EE offices and EMIS are adopted also on local level, especially for buildings of public purpose.

2.4.3.1 HR Energy Efficiency at Local Level

Legislative framework of national level is also in force on local level. This allows for allocation of funds from local government units for co-financing of EE and RES projects in households and in apartment buildings as well (also co-funded by EPEEF).

2.4.3.2 HR Urban regeneration at Local Level

Regulation for urban regeneration is in force as described for national level. No specific regulatory framework has been developed for urban regeneration on larger scale, such as on the level of neighbourhood.

There is no special explicit mention of energy efficiency in Croatian spatial plans, but the Building Act prescribes that the designing and construction of any new building must follow energy efficiency regulations (already in the process of elaborating the preliminary and main design of all buildings).

All the city or municipal spatial plans must be harmonized with the county spatial plans, which consequently must be harmonized with the national spatial plan.

3 Management mechanisms (including coordination and engagement of stakeholders)

This section is directly related to Deliverable D2.2 Stakeholder Mapping. D2.2. which identifies stakeholders in each of the participant countries, and the objective of this section is to identify how those stakeholders are driving energy efficiency into urban regeneration processes.

Management mechanisms may vary from country to country due to the different roles each stakeholder assumes in Member States.

The national government is an essential stakeholder especially in energy policies but other administration level (regional and local) as well as other public sector and nongovernmental sector participation in urban planning decision making process takes a very relevant role.

The following section analyses different management approaches and instruments developed in Spain, Netherlands and Croatia regarding Energy Efficiency and Urban regeneration.

3.1 Europe

European policies are a compromise between all different national interests: economics, industry, environmental, health and safety, social, etc.

There are 3 EU government institutions at the legislative and policy making levels:

- The European Commission
- The European Parliament
- The Council of Europe

Each legislation is originated from and responsibility of a Directorate-General (DGs) depending on the topic. Environmental legislation such as the Energy Efficiency Directive is originated from the DG Environment, DG Energy, DG Climate, DG Research, DG Transport, etc.

The urban dimension at European level is managed by Directorate-General for Regional Policy or DG Regio, whose strategies focus on economic, social and environmental issues.

3.1.1 European Energy Efficiency

The Directorate-General (DG) Energy is the responsible to initiate and draft Energy legislation for the European Commission. Energy strategies are driven from Europe to MS.

Despite the effort made to include cities in the development of the Member States' national reform programmes (NRPs) and in the partnership agreements for the European Structural and Investment Funds (ESIF) in the practice progress has been quite limited.

Many European cities have voluntarily joined the '**Covenant of Mayors**'⁹, an initiative which encourages European cities to combat climate change by developing Sustainable

⁹ http://www.covenantofmayors.eu/index_en.html

Energy Action Plans (SEAPs) at local level which are a basis for future implementation of specific projects on energy efficiency and use of renewable energy sources.

They involve local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO₂ reduction objective by 2020.

3.1.2 European Urban regeneration

As mentioned before, urban issues are not a direct European Union (EU) competence. Having said this, the European Commission works on urban issues through several Directorates-General, such as DG of Regional and urban policy (DG REGIO).

DG REGIO has contributed to the sustainability of urban development of European cities as a key element of the European cohesion policy.

The ENVIRONMENT DG also works on urban environment and urban sustainability, inspired by the "Thematic strategy on environment-friendly urban COM (2005) 718 final".

URBAN Community initiatives, URBAN AUDIT and the URBACT programme have implemented the integrated approach in many cities across Europe focusing on promoting equality, social inclusion and regeneration in urban areas among others. The advantages of an integrated approach have been demonstrated in these programs. URBAN I (1994-2000) and URBAN II (2000-2006) programmes for deprived neighbourhoods with an integrated approach were developed at European level.

Within the European urban strategy, the multi-dimensional approach of the territorial strategies has developed in new integrating tools under the Common Provision Regulation¹⁰. Those are:

- Community-led local development (Article 32-35) and
- Integrated territorial investments (Article 36).

Integrated territorial investments (ITI) allow EU Member States to combine investments from different priority axes and Operational Programmes. The ITI will be implemented through actions on different scales of urban development from the territory to all size of cities and neighbourhoods.

Other management mechanisms are:

European Urban Knowledge Network (EUKN) is a network of national governments and knowledge institutes. It involves 10 EU Member States (National Focal Points), EURO CITIES, the URBACT Programme and the European Commission, sharing knowledge and experience on tackling urban issues.

The **Council of European Municipalities and Regions** (CEMR) gathers local and regional authorities in Europe (more than 50 national associations of towns, municipalities and regions from 41 European countries) to deal with urban development

¹⁰ <http://ec.europa.eu/digital-agenda/en/news/eu-regulation-common-provision-regulation-cpr>

The **EU urban agenda** is an opportunity to better involve local governments in the EU decision making process and to best match their priorities. This is one of the messages CEMR addressed during the European Cities Forum on “An urban agenda for Europe”, organised by the European Commission, on 2 June 2015. The European Urban Agenda will contribute to improve policy, funding and regulation process at different levels: EU, regional and national level

3.2 Spain

3.2.1 National

3.2.1.1 ES Energy Efficiency at National Level

IDAE (Institute for the diversification and saving of energy) is the National Energy Agency under the Secretariat of State for Energy of the Ministry of Industry, Energy and Tourism. Its duty is to technically advise the Ministry and develop the policy dictated by the Government in energy efficiency, diversification of sources of energy and development of renewable energies.

Regarding Energy Certification, besides the Decree 240/2011 of 22 November 2011 in the development of the requirements of the Directive 2010/31/EU, the Urban Refurbishment, Regeneration and Renovation Act (L3R), Law 8/2013, of 26th of June, contains the basic regulation of the Evaluation of Buildings Report and includes the buildings Energy Efficiency Certification.

It is the regional governments’ duty to develop the procedure for the certification of the energy efficiency of buildings, and therefore it is raised in Section 3.2.2.1. *ES Energy Efficiency at Regional Level* of this document, focusing on the Basque Country’s procedure.

Passing of Plan 2000 ESE for promoting energy efficiency in public buildings.

2,000 public centres will be identified and will become energy efficiency projects; 1,000 belong to regional and local authorities and the other 1,000 to the Spanish state administration.

Resolution of 28 September 2010, of the State Energy Secretariat, publishing the Resolution of the Institute for Energy Diversification and Savings, established the economic lines of support and incentives for participation of energy service companies in the plan for activation of energy efficiency in state-owned buildings. The responsible body is the Ministry of Industry, Tourism and Trade.

3.2.1.2 ES Urban regeneration at National Level

As mentioned in previous sections, in Spain urban planning competence is driven by regional governments and therefore national public bodies cannot carry out any urban related actions. This has driven into many conflicts because it is intended to revitalize the construction sector through urban regeneration measures and, conversely, there are many of the urban aspects that exceed to other sectorial issues.

Following, some of the urban regeneration stakeholders at national level are presented:

FEMP (Spanish Federation on Municipalities and Provinces)

The Spanish Federation of Municipalities and Provinces (FEMP) is the nationwide Association of Local Entities with the largest established base, grouping together Municipalities, Delegations, Councils and Insular Councils: a total of 7,287, who represent more than 89% of Spanish Local Governments. It works on different areas such as the Area on Development and Housing. The principal objective of the Area on Development and Housing is the promotion amongst its affiliates of integrated, cohesive and sustainable urban development that in turn envisions active housing policies.

Rehabilitation Working Group (Grupo de Trabajo de Rehabilitación_GTR)

The Working Group for Buildings Rehabilitation ("GTR" – Grupo de Trabajo sobre Rehabilitación) is an 11 independent experts group (together with 25 International and Domestic advisory experts) founded in 2010 which came together with the objective of defining a strategy that will allow for the transformation of the current built environment and the buildings sector in Spain.

The GTR expert members agreed that there was a need for change in Spain's buildings sector and that this might also help to resolve some of the key challenges facing the Spanish economy and to meet its environmental goals. GTR has published three annual reports in 2011, 2012 and 2014¹¹.

Collaboration Agreements to the development of the National Plan of development of rental housing, building rehabilitation and regeneration and urban renewal, 2013-2016¹²

As will be explained in more detail in Section 4.2., the National Plan financial aid is managed by the Autonomous Communities' governments or regions. The development of the 8 programs included in the National Plan is conducted through Collaboration Agreements in which all conditions and financial aids amounts are established. Sixteen Autonomous Communities have adopted Collaboration Agreements with the Ministry of Public Works to develop some of the Programs included in the National Plan. The Basque Country is not included among those regions.

3.2.2 Regional

3.2.2.1 ES Energy Efficiency at Regional Level

In some of the Spanish regions Regional Energy Agencies were created to develop and implement the Energy National legislation.

EnerAgen is the Association of Spanish Agencies for energy management. There are currently 19 members in the Association spread throughout the Spanish territory and covering the scope of regional (regional agencies), local (municipal agencies) and supra-municipal (regional or provincial).

¹¹ <http://www.gbce.es/es/pagina/informe-gtr>

¹² http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/ARQ_VIVIENDA/INFORMACION/NORMATIVA/NORMA_ESTAL/VIVIENDA/CCCA.htm

EVE (Ente Vasco de la Energia) is the Basque Energy Agency. As such it is its duty to register of energy efficiency certificates in the Basque Country.¹³

The register of energy efficiency certificates in the Basque Country, set up in 2013 in compliance with the objectives of Decree 235/2013 on certification, is a public telematic tool containing information on certificates for new and existing buildings. Its aim is to encourage energy saving and efficiency and allow assessment and comparison of buildings, with a view to promoting those with high levels of energy efficiency and investments in energy saving.

Competent body: The directorate with powers in the area of energy, which forms part of the Department of Economic Development and Competitiveness (DED&C); EVE Management

Energy service companies (ESCOs)

Energy service companies (ESCOs) generate business by achieving energy savings for their clients, resulting in a reduction in their total expenses.

In recent years, the Basque Government, with the direct collaboration of EVE, has made a determined commitment to encouraging this business model, mainly through the action plan for energy efficiency in buildings owned by the Government of the Autonomous Community of the Basque Country, which seeks to reduce the energy consumption of one hundred public buildings by 20% by 2020.

One example is that of the Association of Municipalities of Txorierri which awarded the contract for management of its public lighting to an ESCO, with the support from EVE in the entire contracting process.

The following are the Basque regulations regarding EE certification:

	Title	Website
DECREE 226/2014	Energy efficiency in buildings certification	https://www.euskadi.eus/r48-bopv2/es/bopv2/datos/2014/12/1405379a.pdf
ORDER of 16 March, 2015	Control and registration of Energy Efficiency Certificates.	https://www.euskadi.eus/r47-bopvapps/es/bopv2/datos/2015/03/1501447a.shtml

Table 11 Basque Country's EE legislation

DECREE 226/2014. Energy efficiency in buildings certification

The purpose of this Decree is to adapt current Basque regional legislation on energy certification for new buildings, contained in Decree 240/2011 of 22 November 2011, to the requirements of the Directive 2010/31/EU developed by Royal Decree 235/2013, of 5 April, approving the basic procedure basic for energy certification of buildings.

The new regulatory framework regulates the receipt, registration, updating, inspection and control of Certificates of Energy Efficiency of Buildings, the way these are reflected in

¹³ http://www.industria.ejgv.euskadi.eus/r44-in0100/es/contenidos/informacion/eficacia_energetica/es_eficacia/eficiencia_energetica.html

Energy Efficiency Labels, use of these labels and the information the seller must provide to the buyer and the lessor to the lessee in order to protect the rights of consumers and users.

ORDER of 16 March, 2015, of the Regional Minister of Economic Development and Competitiveness, Registration of Energy Efficiency Certificates.

In accordance with the terms of Decree 226/2014 of 9 December 2014, regulating energy efficiency certification of buildings, this Order regulates the control of Energy Efficiency Certificates, wherever they are required, and registration in the Register.

Decree 226/2014 of 9 December 2014, governing certification of energy efficiency of buildings updated the current regional legislation on energy certification for new buildings to adapt it to the changes made in Spain under Royal Decree 235/2013 of 5 April 2013, approving the basic procedure basic for certifying energy efficiency of buildings.

This decree repeals the previous regulation and, in line with state and community requirements, extends its area of application to existing buildings. Specifically, it repeals Decree 240/2011 of 22 November 2011 and its development in the Orders of 12 December 2012 and 2 April, 2013, respectively regulating external control and registration of Energy Efficiency Certificates.

3.2.2.2 ES Urban regeneration at Regional Level

Basque Government; Housing Department; Rehabilitation Working Group¹⁴

The Housing Department of the Basque Government has created a specific working group to work on regeneration, open to the participation of major refurbishment and regeneration agents in order to explore, through a participatory process, the availability and the level of cooperation of key institutions and agents. The Working Group aims to reach a shared understanding and agreement about the regional needs in the field of rehabilitation, renovation and urban regeneration.

In addition to the working group, a website open to all citizens was enabled so they can comment and contribute to the ongoing work¹⁵.

Basque Government; Environmental Department; Territorial Planning Guidelines – Review¹⁶

Within the territorial planning guidelines, each municipality must make a forecast for number of new homes, based on demographic and supply and demand parameters. It is important to note that quantification standards are affected by regeneration projects, as increases in housing units from regeneration projects do not count for planning purposes.

The Department off Environment and Social Policy considered necessary to review the Regional Planning Guidelines (DOT) to adapt the lessons learned, to respond to the new

¹⁴ <http://www.irekia.euskadi.eus/es/debates/1047-rehabilitamos-contigo?stage=presentation>

¹⁵ <http://etxebizitza.blog.euskadi.net>

¹⁶ <http://www.irekia.euskadi.eus/es/debates/1056?stage=presentation>

challenges of regional planning and, most importantly, to be built on the basis of a broad participatory process, both from the various public institutions, as well as from political and socioeconomic agents, and the citizens.

The department has therefore agreed to a revision of regional planning guidelines (DOT) through a participatory process, and the revised guidelines are expected to be presented in November 2015.

There are a number of issues on which it is considered appropriate to open a reflection from a territorial point of view, including the urban environment with special attention to urban regeneration, metropolitan areas and axes of transformation, the perimeter of urban growth, residential quantification, and territorial sustainability.

Basque Government, Basque Housing Observatory¹⁷

The Housing Department of the Basque Government act as an information hub and knowledge space gathering all official statistics and all those studies and reports of the sector . The recent report evaluating policies for building refurbishment (2014) presents a good overview of the building stock, opportunities and current policies to promote building refurbishment and urban regeneration.

Basque Government, Housing Department, creating of a new Basque Housing Body¹⁸

The Basque Housing Act establishes the creation of an autonomous body, which will bring together all the public companies and agencies involved in housing, to serve all the activities related to the provision of social housing and accommodation.

Basque Government, Housing Department; Euskoregite: registry of Technical Building Inspection (ITES)

The Basque Government Housing Department, through the Decree of Technical Building Inspection, creates and regulates the registration of the technical inspection of buildings through Euskoregite. The information received by the municipalities is therefore sent to a single record for the whole Basque Country managed through the EuskoRegite platform, which is accessible to all citizens. This information base will help on the definition of urban policies, as well as on defining specific intervention strategies in urban regeneration areas.

ERAIKUNE Basque Construction Cluster¹⁹

Eraikune, the Basque Construction sector Cluster, brings together companies across the entire value chain of the construction sector (materials and products, architecture offices, engineers, developers, construction companies, professional associations, laboratories, control offices, technology centres, consulting companies, training centres and universities). The cluster operates through working groups, and there are two active groups discussing and planning strategies for urban regeneration and for building refurbishment.

¹⁷ <http://www.garraioak.ejgv.euskadi.eus/r41-ovhome/es/>
<https://www.euskadi.eus/informacion/informe-de-evaluacion-de-la-politica-de-rehabilitacion-2014/r41-ovad03/es/>

¹⁸ <http://www.euskadi.net/bopv2/datos/2015/06/1502853a.pdf>

¹⁹ www.eraikune.com/

Eraikune is currently immersed in the definition of the Strategic Plan 2015-2017. Within the specific team of "Innovation and sustainability", one of the strategic lines is the sustainable renovation, including the urban regeneration and maintenance.

The "Strategic Subcommittee of Rehabilitation, Urban Renewal and Maintenance" was launched at the end of 2012. Since then, 31 companies have participated in representing all areas of the entire chain of value of the sector and have held 5 meetings so far to precisely define the strategy to address in the coming years in this field.

The Strategic Plan is aligned with the Housing Master Plan of the Basque Government 2014-2016 and the promotion of the rehabilitation, renovation and urban regeneration: putting the built city in value, especially in those actions which aim improving sustainability and energy saving.

A complete rehabilitation produces important benefits for users of the rehabilitated building, such as comfort and economic savings

It is ERAIKUNE's task to integrate all different agents participating in the project, both, starter agents as those that may be required later. A relevant result will be the market R&I surveillance on rehabilitation and the availability of this knowledge to the whole of the sector.

Basque ENERGY Cluster (ACE)²⁰

ACE's activities are focuses around a set of strategic areas of priority for the energy industry in the Basque country, one of these selected strategic areas being Energy Efficiency in buildings.

The Cluster aims to exploit and develop the business opportunities generated by the growing demand for energy efficiency in the building with the aim of boosting the business offer and create a brand image of the Basque country in energy efficiency.

For this reason, it is very important to create new companies or reorient the existing ones towards higher value-added activities to take advantage of the increase in energy efficiency in buildings and facilities services public and private.

Diagnosis of intervention needs in the renovation of the Park built in the Basque country.²¹

We would like to mention in this section this work developed by Tecnalía, GIAU+S (UPM) and Caviar (UPV) for the Department of Housing, Public Works and Transport in 2011 as a working tool to begin the defining prioritization of needs of urban areas.

The work aims to obtain an inventory and diagnosis of the residential buildings stock before 1980 in the Basque country and its urban environment, in order to determine the real situation of the built space.

The work's objective was to define rehabilitation strategies, to guide the urban regeneration policies of urban areas to set operative priorities and intervention strategies.

²⁰ www.clusterenergia.com

²¹ http://www.etxebide.euskadi.eus/contenidos/nota_prensa/npetxe120307_inventario_parque/es_npetxe/adjuntos/barrios1.pdf

3.2.3 Local

3.2.3.1 ES Energy Efficiency at local level

Sustainable Energy Action Plan (SEAP)

As explained in Section 3.1.1. *European Energy Efficiency* the Covenant of Mayors is a European initiative by which towns, cities and regions voluntarily commit to reducing their CO₂ emissions beyond this 20 % target. This formal commitment is to be achieved through the implementation of Sustainable Energy Action Plans (SEAPs).

SEAP is the key document in which the Covenant signatory outlines how it intends to reach its CO₂ reduction target by 2020. It defines the activities and measures set up to achieve the targets, together with time frames and assigned responsibilities. Covenant signatories are free to choose the format of their SEAP, as long as it is in line with the general principles set out in the Covenant SEAP guidelines.

Bilbao`s SEAP²² was approved in 2012 and include actions and measures aimed at reducing the CO₂ emissions and final energy consumption by end users.

Agenda 21

The United Nations sustainable development action plan Agenda 21 implemented at municipal level is named Local Agenda 21. This municipal strategy plan is based on integration, on sustainable basis, of environmental, economic and social policies. This development plan is carried out with participation and decision making consensus among local authorities, municipal staff, stakeholders and citizens of the municipality.

Collaboration Agreement between EVE and HAZI²³, to encourage the use of forestry biomass for energy purposes

This agreement allows for analysis of the potential use of this resource for the heat facilities of participating municipalities.

Use of renewable energy sources such as biomass reduces dependency on fossil fuels. Municipalities interested in using their forest resources for energy purposes, can request help from EVE (Ente Vasco de la Energía) and HAZI (food, coastal and rural development), in the following link: www.biomasaeskaki.net.

Municipal energy management

The proposal for Basque municipal authorities is based on identifying and implementing proper municipal energy management, to be led by the local council itself with help and/or support from EVE.

This management is based on energy planning, which involves drawing up sustainable energy action plans (SEAPs) to 2020, which give details of energy actions to be undertaken throughout the municipal domain.

²² http://www.covenantofmayors.eu/about/signatories_en.html?city_id=1422&seap

²³ <http://www.hazi.es>

These action plans give councils a working guide, enabling them to lead and prioritise the energy actions to be undertaken on appropriate technical and economic grounds. This helps prevent actions being implemented that are not part of a defined and ordered strategy.

There are currently a number of different frameworks available to Basque municipalities to allow them to develop criteria-based energy plans. EVE offers the following frameworks:

(1) Covenant of Mayors is the principal European initiative involving local and regional authorities who have accepted a voluntary commitment to improve energy efficiency and use renewable energy sources in their areas. The signatories of the Covenant undertake to go beyond the EU target to reduce CO₂ emissions by 20% before 2020.

(2) Advancing towards the Covenant This agreement is targeted at municipalities that require a different scope and schedule to that established in the Covenant of Mayors. The initiative was launched when it became clear that the same time periods and the scope of the work involved in developing a municipal energy plan were not feasible for all towns, whose possibilities vary depending on the technical, economic and staff resources available to each local council. Under the agreement, the mayors undertake to establish specific actions in each energy-consuming sector in the municipality (public lighting and municipal buildings, transport, services, the residential sector).

3.2.3.2 ES Urban regeneration at local level

As mentioned before, in Spain the most spread tenure regime of dwellings is individual property. Each owner owns a percentage of the whole building but in order to decide upon common questions of the building, a Home Owners' Association is established.

Home Owners' Association is the body who manages all decisions regarding the legal duty to maintain and conserve the building and any decision that may affect common parts of the building.

Besides the Municipal Urban Departments, there are other stakeholders involved directly in urban regeneration at local level, as shown below:

Basque Urban Rehabilitation Societies (SUR)

The mentioned Decree 317/2002 on Protected Rehabilitation Activities of Urbanized and Built Heritage, besides the Municipal local administration, gives especial power to the Basque Urban Rehabilitation Societies (SUR) in order to carry out the implementation of the Rehabilitation Special Plans of declared Areas of Integrated Rehabilitation (ARI).

ARI's are therefore declared by the Municipal government but then it is the SUR duty to implement the Rehabilitation Special Plan. Urban Rehabilitation Societies cover 62% of the Basque Population and they are the ones that manage urban regeneration funding of the declared ARIs.

In 1985, Bilbao City Council founded its SUR, Surbisa, as a response to the need for rehabilitation of the old town of Bilbao, which was suffering an important economic, construction and social deterioration. The City Council of Bilbao decided to address this situation by developing a specific plan in this regard with the Special Plan of Rehabilitation of the Old Town (Casco Viejo) and Surbisa was the agency in charge of managing this

plan, which exceeds the ability of the City Council. This process was later repeated in a nearby area, the Area of “Bilbao la Vieja”.

In smaller size neighbourhoods it is not reasonable to make any Special Plan of Rehabilitation, due its complexity, documentary and temporal extent, and therefore other complementary measures are regarded.

HIRITARROK, Bilbao’s Federation of neighbourhood associations ²⁴

Hiritarrok gathers most of Bilbao’s neighborhood associations in the aim of constructing and developing a city for its citizens. Its Urbanism technical group of (GTU) is actively participating in the new General urban Plan of Bilbao and they regularly meet with government agencies.

Bilbao Ekintza – Eco-Urban Solutions working group ²⁵

Bilbao Ekintza is a local public body to promote economic and social development of the city. Bilbao Ekintza is managing working groups involving different public and private local stakeholders, and has one specific group focusing on “eco urban solutions” which involves various companies and public bodies related to building refurbishment and urban regeneration.

Bilbao Social Housing (Viviendas municipales de Bilbao)²⁶

Bilbao Social Housing is an instrument for implementing and developing social housing policy of Bilbao’s City Council. It provides housing to be rented to those people who require it. Bilbao Social Housing dwellings stock (4.090 dwellings) is designed for those groups facing the greatest difficulty in finding a home due to their social or economic circumstances.

Bilbao Ría 2000²⁷

Bilbao Ria 2000 is a public company created in 1992, on the initiative of Bilbao town council, Regional Government of Bizkaia and the Basque Government. Later other public administrations such as National Government, National network of Spanish railways, port authority and other would join them. Bilbao Ria 2000 was created to manage the recovery and transformation of degraded areas in the metropolitan area of Bilbao, regenerating mostly unused industrial spaces located on both banks of the river.

3.3 Netherlands

3.3.1 National

3.3.1.1 NL Energy Efficiency at National Level

Platform 31 – Programme Energiesprong (energy leap)²⁸

²⁴ http://www.bakarra.net/cms/media/Hiritarrok_3.pdf

²⁵ <http://www.bilbao.net/BilbaoEkintza/es/index.html>

²⁶ <https://www.bilbao.net/viviendasBilbao/Default.aspx?tabid=210>

²⁷ www.bilbaoria2000.org/

Platform31 is a knowledge and networking organization for urban and regional development after a fusion of several institutes in this field. Main partners are all levels of government, housing associations, and universities. Their innovation programme Energiesprong, commissioned by the Ministry of Interior and Kingdom Relations, aims to supercharge supply and demand for zero energy bill buildings: dwellings, offices, shops, public health buildings. Point of departure is that there is a need for new practices in construction: a different way of requesting quotations, better supply, more financial options, adaptations in rules and regulations, and another way of approaching the subjects like procurement strategies and new contract models. This is done by:

- Supporting innovative projects by process and sometimes advising on subsidies. Criteria are high energy ambitions, large scale, replicability and process renewal.
- Facilitating knowledge growth and exchange in close cooperation with front runners: new insights and successes, but also learning points, mistakes and failures are made available to other parties.
- Development of tools and lobbying to remove barriers

One of the initiatives under the Energiesprong programme is the “stroomversnelling koopwoningen” (focusing on scaling up energy efficiency for privately owned houses, as opposed to a similar program that focuses on improving the housing corporation stock)²⁹. It is a unique cooperation between over 200 parties from governments, energy companies and initiatives, construction and installation companies, banks, realtors and several other stakeholders. Their aim is to scale and speed up supply and demand for zero-energy bills homes for privately owned terraced houses from 1950-1980 (1,8 mln homes in total, about 70% privately owned). It includes “renovation stores” for ready to go energy efficiency packages, guarantees for supply and demand, financial products, the inclusion of the energy performance of the house in valuation by real estate brokers and cooperation between municipalities and energy cooperatives. It strives to implement the renovations in 1-2 weeks by means of prefab components for the building and new installations, to get to an all-electricity house. Energy savings should cover the monthly loan costs. The minister of Interior and Kingdom Relations has promised to try and improve the possibilities for financing within the mortgage loan structure as well. Pilot projects run to 1 January 2016, after which the measures should become more widely available commercially.

Energy support program VNG³⁰

The Association of Netherlands Municipalities’ (VNG) support program for the Energy Agreement focuses on two aspects:

1. Built environment and homeowners. The national government has made available €15 mln for regional support and development of expertise and skills.
2. Other aspects of the Energy Agreement that municipalities will surely encounter: e.g. renewable energy production outside the built environment (wind, biomass), improving energy efficiency in local commercial settings etc.

The role of the municipality is changing now that residents, companies and social organizations themselves take initiative for local energy projects. The municipality has a

²⁸ <http://www.platform31.nl/wat-we-doen/energiesprong>

²⁹ <http://www.stroomversnellingkoopwoningen.nl/wat/>

³⁰ <http://vng.nl/files/vng/publicaties/2014/20140327-vng-ondersteuningsprogramma-energie.pdf>

more supporting role, focusing on information, knowledge exchange and expertise. Therefore existing knowledge, programs and initiatives need to be reinforced, renewed, connected and accelerated. Roles of the municipality include: stimulating, initiating, regulating, facilitating, or sparring partner; and may differ per initiative. This requires new skills for the municipality. The goal of the support program is to further develop partnerships and alliances and work towards feasible, replicable business cases within societal initiatives.

For the built environment and private homeowners, the aim is to support and accelerate programs and initiatives for energy efficiency and local renewable energy, leading to a contribution of 3-7 PJ in the Energy agreement. The means involve increasing awareness, to improve financing and to unburden homeowners. The starting points of this program are to map local needs, create room for local initiatives, to utilize existing structures (physical, knowledge etc.) and to reinforce and connect local dynamics, eventually also scale up to the regional level. The program consists of four components: regional support through coordinators, make existing knowledge better available, expertise-development to improve process approaches and accompanying competences in learning networks, and yearly evaluation and monitoring (outputs and outcomes).

Topsector Energy³¹

From 2012 onwards more and more of Dutch R&D funding will be coordinated by the Top Sectors, a.o. Energy. These are sectors in which the Dutch companies have a strong global position in terms of high labor productivity, are knowledge- and labor intensive and provide good export opportunities. The topsector Energy works on clean and efficient energy, where innovations contribute to lowering the costs of CO₂-emission reduction, developing RES and smart utilization. The topsector aims to stimulate private-public cooperation in research and innovation. It is a collaboration between (large and small) business, science and government in which research program lines for technical and social innovations are developed that will benefit economic possibilities for Dutch businesses. There are seven topconsortia for knowledge and innovation within this topsector: offshore wind, natural gas, switch2smartgrids, enerGO (focusing on the built environment), solar energy and (together with the topsector chemical industry) biobased economy and sustainable process technology. The topsectors are a way of managing the development and transfer of knowledge as well as a way to finance that: subsidy budgets are earmarked and need to be co-financed by business parties (40%). The projects eligible for grants cover fundamental research, industrial research and demonstrations.

GEN (Gebieden EnergieNeutraal) – Zero Energy Districts³²

GEN focuses on a replicable approach and solutions that are feasible without subsidies. The ambition is to establish a zero energy districts (i.e. not just one building). This ambition forces parties to a different approach of the process compared to business as usual with regards to technology, financing, rules and regulations, cooperation, end user behavior. GEN aims to provide benefits for all parties involved: local and national

³¹ <http://topsectoren.nl/energie>
<http://topsectorenergie.nl/tkis/>
<http://www.tki-energo.nl/wie-zijn-wij/>
<https://setis.ec.europa.eu/energy-research/country/netherlands>
³² <http://www.gebiedenenergieneutraal.nl/over-gen>

governments are provided with knowledge on barriers to overcome to increase speed and success for the energy targets; market parties will gain knowledge and expertise for their products or services; and benefits for the end-users (residents) are key: a comfortable, healthy and affordable house. On the district level, cleaner air and a better quality of the built environment. GEN is a knowledge development project: learning by doing and developing best practices for process, technology and organization. This is done by experts in a front runner consortium, where necessary supported by experts from outside or from other innovation programmes (e.g. Energiesprong). The program was funded by €5 mln from the national government and €4 mln by the consortium partners (a.o. energy company Eneco, grid operator Alliander, installation companies Feenstra and Cofely, construction company BAM, consultancy Royal HaskoningDHV, law firm Eversheds). All knowledge is made publicly available.

Blok voor blok (Block by block)³³

Blok voor blok aims to create a movement for energy savings in the existing housing stock. It is a knowledge and learning project by Netherlands Enterprise Agency (RVO) and the Ministry of Housing with 14 cases where market parties, municipalities, corporations and provinces work together to make 1500-2000 dwellings in the municipality more energy efficient (two label steps). The total project size is at least 23500 dwellings, with investments from market parties much larger than the subsidies, which are only intended for the extra costs of sharing knowledge and approaches, for example to design concepts for energy efficiency and financing. The execution of the cases, including the technical measures, is funded by market parties. Cases included homes owned by corporations as well as privately owned homes.

Green deals³⁴

With the Green Deal approach, the government provides space for new initiatives in society for the transition to a sustainable economy. Themes include energy, food, water, raw materials, biodiversity, mobility, biobased economy, climate and built environment. The Green Deal approach aims to remove project barriers for other stakeholders: from rules & regulations to financing. Green deals preferably intend to inspire others to create more impact.

Examples include: increasing the development and use of harmonized CO₂-emissions calculator tools; an expertise center for financing smaller energy projects or other aspects that are challenging from a financial standpoint; better local utilization of PV by combining it with electric vehicle charge points; professionalization of local energy initiatives; several projects on the use of waste heat and geothermal energy; how to improve the costs and benefits distribution of district heating through valuation in the energy label; scale-up of smart grids; improving the energy efficiency of monumental buildings; new opportunities with smart meters; replacing asbestos roofs by PV roofs; etc.

MilieuCentraal (Environment Central)³⁵

³³ <http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/blok-voor-blok>

³⁴ <http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/groene-economie/green-deal>

³⁵ <http://www.milieucentraal.nl/over-milieu-centraal>

MilieuCentraal is an independent, reliable and practical source of information for sustainable living aimed at citizens. All tips and advice on this website is based on scientific research and reflection by societal parties. Moreover there is a scientific advisory board to guarantee quality. Themes include a.o. energy savings in the home (energy savings, PV panels and devices), but also information about tourism, mobility, and food. It is financed for 2/3 by the government (Ministry of Interior Affairs and Ministry of Infrastructure and Environment) and 1/3 by business.

HIERopgewekt (ProducedHERE)³⁶

HIERopgewekt is a knowledge platform for local sustainable energy initiatives. The diversity of initiatives is huge: different sizes, development stages, legal forms and ambitions. HIERopgewekt reinforces initiatives, connects people that work for sustainable energy and supports them while realizing their ambitions. In order to professionalize, connect and positively position these initiatives, overcoming barriers with knowledge, especially on the organizational side. This is done online (knowledge content and inspirational examples) but also offline through theme sessions and other events, to connect people and let initiatives learn from each other. HIERopgewekt is a cooperation of the HIER climate bureau (an independent, not for profit foundation) and ODE-Decentraal (an interest group for citizens that produce renewable energy). It is co-financed by the VNG and DSOs Alliander, Stedin and Fudura (part of Enexis).

Meer met Minder (More with Less)³⁷

In Meer met Minder, the building, installation and energy sector work together to inform citizens about the advantages of energy savings, neatly bundled in one website. For the execution of the measures that are displayed on this website, citizens can contact their suppliers that can take care of the entire project for them, making it as easy as possible for citizens to save energy. It is not a government initiative, but it is an important partner for local governments to obtain their climate & energy targets (this in particular is part of a sub-initiative called BespaarLokaal/SaveLocally, focusing on home improvements as well as residents' behavior).

3.3.1.2 NL Urban regeneration at National Level

Agenda City

Agenda City (Agenda Stad) is a management mechanism that is initiated by the national government but incorporates city authorities, their partners, research organization, practitioners and citizens and is related to urban regeneration. Agenda City is platform and movement that focuses on cities and urban regions, as cities are becoming of more and more importance to the Dutch economy. The aim of the mechanism is to strengthen the (international) competitive position of Dutch cities. Social and technological innovations, sustainable development to improve livability, and governance cooperation are identified as key elements. Agenda City wants to identify the social trends and technological developments, identify the changes that are necessary to stay at world level of competitiveness and livability, increase governance power and remove barriers for social

³⁶ <http://www.hieropgewekt.nl/wat-hier-opgewekt>

³⁷ <http://www.meermetminder.nl/43/over-ons.html>
<http://www.bespaarlokaal.nl/1/home.html>

initiatives, differentiation and experimentation and finally, forging coalitions in which parties collaborate around international leading urban innovations. The latter will be done in for example living labs or city deals. Together this must shape the conditions for (system) innovations which increases the quality of cities and provides new opportunities for entrepreneurs and businesses. Infrastructures with open data , energy networks and mobility concepts are examples of conditions. The Netherlands will use their EU Presidency to present this Agenda City on national level.

3.3.2 Regional

3.3.2.1 NL Energy Efficiency at Regional Level

Economic Board Utrecht

The Economic Board Utrecht (EBU) stimulates innovation and cooperation between companies, research institutions and Governments with the aim of a green, healthy and smart region. The cooperation should lead to innovation, more jobs and economic growth. The purpose of EBU is to let the Utrecht region grow into the most viable economy of Europe, also known as green, healthy and smart.

The Economic Board Utrecht was founded by Governments, industry and knowledge institutions in the province of Utrecht and the municipality of Hilversum and consists of a Board and an implementation organization. Various representatives work from their network to the realization of the EBU initiatives.

EBU has the ambition of 50.000 'zero-energy-houses' in the region by 2020. To reach this goal, EBU has developed programs on regional policy, housing corporations, regional companies, inhabitants and financial solutions. Instruments available for energy efficient refurbishments are the Green Energy Production Stimulation Fund (€ 400.000) and the Energy saving Loan for collective housing (€ 10 million)

Network Utrecht 2040

Network Utrecht 2040 is a network with representatives from municipalities, companies, education institutions and societal organisations in the region. The aim is to keep the province attractive and sustainable, now and in the future. The partners work together on urgent issues in the region and the aims of the Utrecht 2040 ambition.

Duurzaam Door – Sustainability through knowledge³⁸

The province is involved with the national program Duurzaam Door. It is a knowledge program for social innovation in the green economy, developing competences and creating synergy between parties, focusing on awareness, knowledge, attitude and action perspectives to make well-informed decisions about sustainability.

3.3.2.2 NL Urban regeneration at Regional Level

There are no management mechanisms identified at this level.

³⁸ <https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/duurzaamheid/netwerken/>

3.3.3 Local

3.3.3.1 NL Energy Efficiency at Local Level

Energy Window (Loket)³⁹

Through the energy window (www.utrecht.nl/energiepuntwonen) the city of Utrecht shares information, tips, good examples, etc. All the available instruments are to be reached through the window. Through the Window the municipality of Utrecht offers an (estimated) 1,500 requests for advice/general assistance & problem-solving services per year.

Energy ambassadors (Ambassadeurs)⁴⁰

The aim of this project is to use peer-to-peer information on energy efficiency. The ambassadors share information, tips, good examples, etc. both via digital channel and personal approach. In general they use a street or neighborhood-based approach. Currently there are 80 ambassadors active. The objective is to have 100 ambassadors by the end of 2015. Through the ambassadors approx. 5,000 Utrecht households receive tailor made information about energy saving.

To support the ambassadors the city of Utrecht offers training, a support team and financial support to cover the costs for meetings (rent of location, coffee, tea).

The effect of the ambassadors is both direct and indirect. The direct effect is that the ambassadors helped their neighbors to make investment decisions on housing improvements. Together the ambassadors created an atmosphere in the city that 'something was happening'. They are the seeds of an energy movement in the city.

Information meetings⁴¹

By organizing meetings for house owners, the Municipality of Utrecht informs them about the possibilities of home improvement and offer them a 'road map' towards an energy efficient house.

In 2011 the municipality of Utrecht started with street-by-street meetings, based on the contacts of the housing ambassadors. From there on they expanded the number of meetings (now approx. 2 per month), the size of the meetings (from street-by-street to city-covering), the type of meetings (special meetings aimed at specific target groups such as apartment blocks, specific themes such as solar power). More recently the municipality of Utrecht changed their focus from organizing the meetings by themselves to support of meetings organized by others. The initiative for organizing the meetings is now with ambassadors, associations (VVE belang, vereniging Eigen Huis) and building/retrofitting companies.

With the meetings they reach approx. 6.000 house owners per year.

Retrofit advice⁴²

³⁹ <http://www.utrecht.nl/utrechtse-energie/bewoners/de-gemeente-helpt-u/ik-heb-een-eigen-woning/>

⁴⁰ <http://www.utrecht.nl/utrechtse-energie/bewoners/de-gemeente-helpt-u/energieambassadeurs/>

⁴¹ <http://www.utrecht.nl/utrechtse-energie/bewoners/agenda/>

⁴² <http://www.utrecht.nl/utrechtse-energie/bewoners/de-gemeente-helpt-u/energieadvies-op-maat/>

Through the website of the city house owners can ask for a detailed retrofit consult. The price for the consult is €220 per house. A specialized consultant visits the house and writes a report about the retrofitting possibilities of the house. If at least one of the suggestions of the consultant has been followed by the house owner, the city of Utrecht will cover for the paid amount.

The city of Utrecht expects to offer 1.000 consults in 2015 plus 500 specific consults on solar power. Approximately 50% of the consults lead to action within a year.

Organizing the supply side⁴³

In the first year of the Energy Plan, the Municipality of Utrecht found out that stimulating demand was not enough. A lot of house owners wanted to retrofit their house, but were not able to find a good supplier. To improve this situation and to increase the activity rate of the house owners the Municipality of Utrecht started to help organizing the supply side.

An independent foundation, Stichting (H)Eerlijk Wonen, organized a competition to select both consultant companies and construction companies for retrofitting projects. They are used as 'preferred supplier'. In the end it is always the house owner who can decide whether to contract one of these parties, or contract another company.

The construction companies pay a percentage of their income as a fee to the foundation. This money is used to take over the system of retrofit advice that was set up by the city of Utrecht.

Renovation stores⁴⁴

Renovation stores is a concept that spreading across the Netherlands after a call by Energiesprong) to market parties. The first renovation stores received some co-financing from Energiesprong. However, new stores are popping up. These actual physical stores focus on private homeowners that want to renovate their house themselves or by others. These stores provide information and sell mostly turnkey, tailor made energy efficiency measurements packets and concepts to interested homeowners. Physical stores seem to be a good way to sell something 'intangible' as renovations. Touching products and seeing and experiencing final result seems to be a key part of the purchase process. In addition, a nearby store, where customers can find clear information about the benefits and costs of a total solution makes the step to sustainable renovation smaller. Until now, these stores are local initiatives are initiated by (or in participation with) local installation- and construction companies. Participation in such initiatives provides them with a good opportunity for additional orders.

3.3.3.2 NL Urban regeneration at Local Level

Operational Program "Opportunities for West" & Integrated Territorial Investments (ITI)⁴⁵

⁴³ <http://www.h-eerlijkwonnen.nl/>

⁴⁴ <http://energiesprong.nl/blog/renovatiewinkels/>

⁴⁵ <http://www.kansenvoorwest2.nl/nl/>

Utrecht participates in several EU cooperation projects. Utrecht is partner in the 'Opportunities for West' Operational Program (ERDF, 2014-2020) which focuses on sustainable urban development by innovation and low carbon economy. It aims to have the Western Netherlands (four major cities (G4: Amsterdam, Rotterdam, the Hague and Utrecht). become one of the top five European larger urban regions. The emphasis in "Opportunities for West" has been, among others, on making use of renewable energy sources and investing in energy efficiency. The four big cities within the Netherlands (G4) face specific challenges, as sections of these cities lag behind and at seem to miss their connection to current economic development giving rise to an economic and social divide. As an Intermediate Body, Utrecht also implements an Integrated Territorial Investment strategy (ITI) that is funded by ERDF/ESF. The Integrated Territorial Investment instrument will be used to implement the G4's urban programmes. These ITI strategies progressed for the cities' vision as they were drawn up in cooperation with local partners and consultation and involvement of all relevant partners (knowledge and educational institutions, societal bodies, enterprises, etc.). The four programs in which the ITIs included in its operational programme correspond to the most vulnerable districts of the four major cities (G4: Amsterdam, Rotterdam, the Hague and Utrecht). Although the main issues differ for each of the G4 cities, all of them are faced with a number of problems that are more intense in comparison to other larger cities in the Netherlands. These ITIs will combine resources of ERDF and ESF to, among other objectives, promote social inclusion by promoting the physical, social and economic regeneration of disadvantaged communities. The actual plans and implementation of those strategies are not yet revealed.

3.4 Croatia

3.4.1 National

Article 7, paragraph 9, of Directive 2012/27/EC, allows the Member States to choose the so-called alternative approach to the system of obligatory energy efficiency, based on measures of energy efficiency policies in the energy consumption, where the annual amount of energy savings must be equal to those that would be generated by application of the obligations of energy efficiency.

3.4.1.1 HR Energy Efficiency at National Level

Programme of Energy renovation of apartment buildings is an alternative measure that would achieve most of the commitments. The measure provides for the launch of a systematic program of reconstruction of apartment buildings.

The plan primarily focuses attention on the apartment buildings built before 1987, and their restoration to the low-energy standard and achieve energy class B, A or A +. The prerequisite for participation in the programme is existence of the project documentation required in accordance with the legislation in the field of construction.

Renovation of the building includes a minimum of thermal insulation of the building envelope, according to the recommendations of an energy audit and other measures that reduce the consumption of thermal energy in the building.

The measure includes:

- Encouraging integral renovation of apartment buildings;
- Increasing the thermal protection of the building envelope;
- Replacement of windows;
- Upgrading or replacing the heating system;

Public authorities for implementation of this measure are MoCCP - control of the authorized designers, EPEEF - securing financing, and building manager or co-owners of the building - choice of a contractor and contracting works.

The bodies for the implementation are the MoCCP - monitoring the activities of authorized persons and the CEI with partnerships with ME and MENP - monitoring of savings.

For purposes of monitoring and ensuring the quality of the developed energy certificates for buildings, a programme has been developed, which is used by authorized persons.

For purposes of monitoring the energy consumption in public sector buildings, and in order to promote the implementation of measures for energy efficiency improvement, the **Energy Management Information System (EMIS)** has been developed. EMIS is a web-based application for the control and analysis of the energy and water consumption. The data is entered on a monthly basis; several buildings are connected to the system by a remote energy consumption meter.

EMIS is located in the Croatian Government Real Estate Agency (APN) which is established by Croatian Ministry of Construction and Physical Planning for implementation of special programmes in real estate sector and construction. In the APN among other departments, two departments are devoted to energy efficiency:

- Department for Retrofitting Programme for Public Sector Buildings.
- Department for Energy Management in Public Sector

Energy Management and EMIS department

Ministry of Construction and Physical Planning has issued the Regulation (Official Gazette no. 18/15) which prescribes the obligation of power management and water consumption analysis, the method of reporting on energy and water consumption and the methodology of systematic energy management in the public sector. The APN is in charge of fulfilling legal obligations. Activities carried out by department of systematic energy management are directly aimed at fulfilling the obligations prescribed by legal regulations, guidelines from the EU directives and international protocols and treaties (such as the Kyoto Protocol).

Most of the activity is focused on meeting the obligations defined in the National program of energy efficiency (2008-2016), National Action Plan for Energy Efficiency (2008-2010), the Law on the efficient use of energy in the final energy consumption (ZUKE Official Gazette no. 127/14) and the Regulations on the systematic energy management in the public sector (OG 18/15), which are intended primarily for the public sector in Croatia.

In order to reduce energy consumption to a minimum, systematic energy management should be a continuous process.

Systematic energy management (SEM) aims to monitor energy consumption in a predefined manner:

Objects of SEM are office buildings, kindergartens, schools, museums, public buildings, hospitals, etc. SEM takes into account systems such as heating, cooling, ventilation, lighting, cooking and the similar. SEM records consumption of electricity, natural gas, fuel oil, wood, heat, including the water.

EE Team (energy efficiency team) is in charge at the level of cities, counties and ministries, and technical personnel and janitors at the facilities.

SEM is implemented through weekly and monthly monitoring and analysis of energy consumption through the information system for energy management (EMIS), planning and implementation of energy efficiency measures and constant educating and motivating EE team and all the staff.

Programme of energy renovation of 200 public buildings involves complete chain of government. This chain of government is presented in detail below.

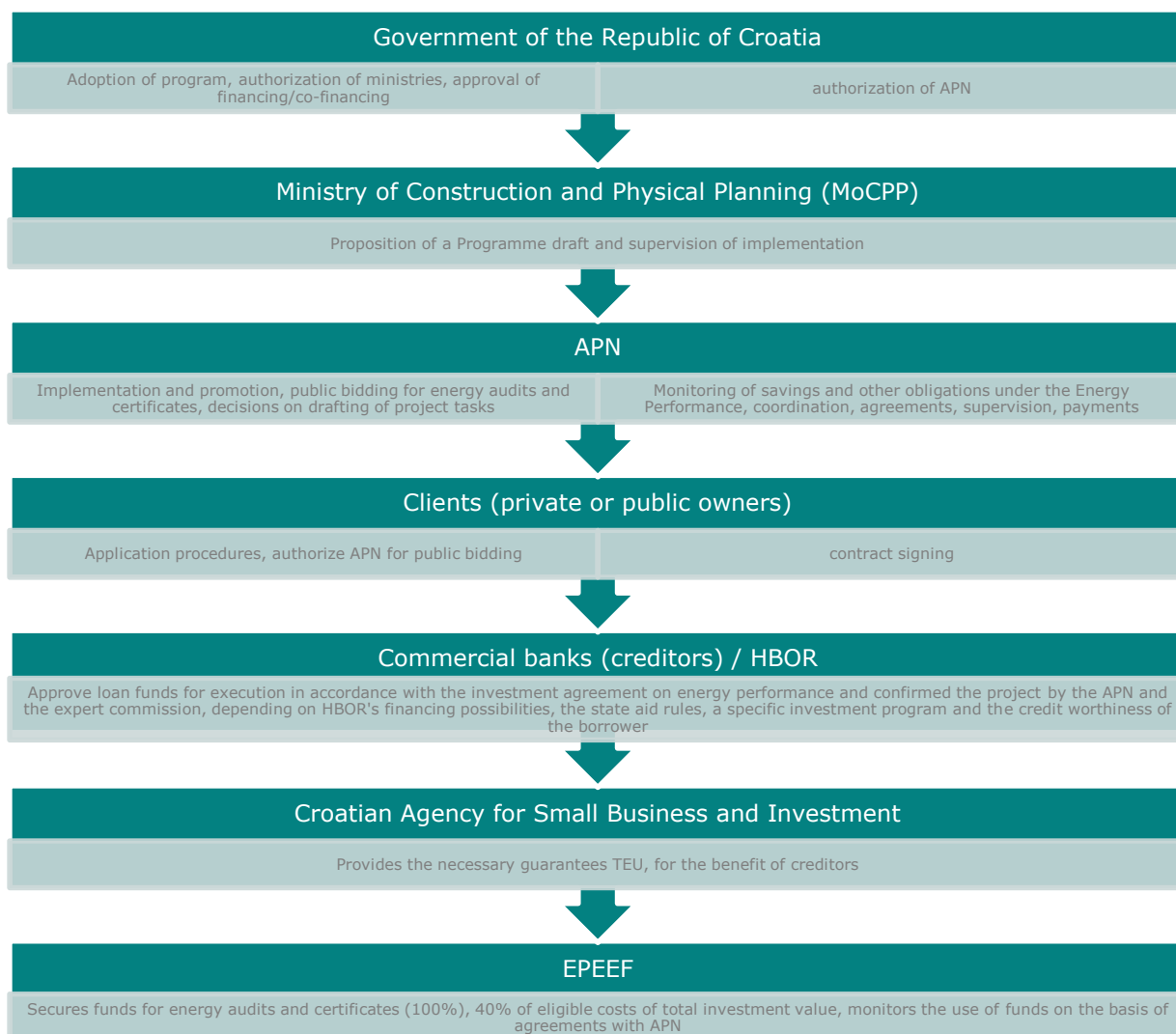


Figure 2 Scheme of chain of government in public building renovation process

3.4.1.2 HR Urban regeneration at National Level

Department for Retrofitting Programme for Public Sector Buildings

Croatian Government at its session held on October 31, 2013 adopted a program of energy renovation of public buildings for the period 2014-2015, which stipulated the renewal of about 200 public buildings in 2014 and 2015, which would encourage investment with estimated value of about HRK 400 million.

One of the goals is to meet the requirements under Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, according to which the Member States are required to achieve, starting January 1 2014, annual renewal of 3% of the total floor area heated and/or cooled of buildings owned and used by the central government.

Act on efficient use of energy in final energy consumption (Official Gazette no. 152/2008, 55/2012 and 101/2013) and the Regulation on the negotiation and implementation of energy services in the public sector (Official Gazette No. 69/2012) regulates the procedure of implementation energy services in the public sector and thus ensures no additional budget expenditure of owner/user to implement measures to improve energy efficiency in public buildings.

All the work started in the Program of energy renewal 2012-2013, conducted by of the Centre for Monitoring of the energy sector and investments, is taken over by the Agency for Transactions and Mediation in real estate in accordance with the Agreement on the transfer of the activities of implementation of the Programme of energy renovation of public buildings 2012/13.

Agency for Transactions and Mediation in Real Estate is in charge of the implementation of the Programme for the period 2014-2015.

In accordance with the recommendations of the "Citizen participation in the planning of energy efficiency improvement" (hereinafter referred to as CENEP) project, experience from previous practices and the results of the analyses carried out, the measures provided in the programme for private sector apartment buildings include a private condominium building (with three or more housing units) while the measures for family houses (residential buildings with up to two residential units) are separated in a special program.

Apartment building in terms of this program is every building that is in whole or in which more than 50% of the gross floor area is used for housing and has three or more housing units, and managed by the building manager, who is a legal or natural person, the according to the Law on Ownership and other Real Rights (Official Gazette no. 91/96, 68/98, 137/99, 22/2000, 73/2000, 129/2000, 114/2001, 79/2006, 141/2006 , 146/2008, 38/2009, 153/2009 and 143/2012). The building manager and owner's representative for energy renovation of its buildings must obtain written consent from the other co-owners.

In the program can participate only legally constructed buildings, according to the Construction Act (Official Gazette No. 153/2013). The program covers the period up to 2020, starting in 2014. MoCPP and other designated competent institutions are responsible for promoting the program and the creation of necessary preconditions (regulatory and financial framework) for its implementation. Due to the high financial resources required

for the implementation of this program, co-financing is foreseen by European Union funds (hereinafter referred to as the EU). Also, in accordance with the provisions of ZUKE, part of the financial resources for the implementation of the program will be provided by the EPEEF.

The savings provided by this program are included in the methodology for system energy efficiency obligations in accordance with Article 7 and Article 20, paragraph 6 and Annex V of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency which notified to the European Commission in January 2014.

For each group of measures the most appropriate "mediator" has been identified between government bodies (the Fund and the relevant ministries) and citizens. It is the "mediator" in charge of the implementation of measures "on the ground". As already mentioned, the apartment buildings will primarily be building managers. Also, local and regional self-government (hereinafter: JLP (R) S) stands as an option, in special cases when building for justified reasons has no manager, to enable the users to apply for the implementation of measures. Also worth mentioning the following conditions and limitations in the implementation of measures:

1. EPEEF and 'mediators' need to have clearly defined criteria for the allocation of funds. The criteria should favour projects that have the greatest technical justification. The technical justification that the savings are included in the project proving improve energy efficiency.

"Final energy state of the building" and verification of energy efficiency improvement of the building proves:

1. project
2. final report of the supervisory engineer and
3. Energy certificate and report on energy audit after renovation.

2. Activities that are contrary to the legislative framework, such as encouraging individual replacement of windows in apartment buildings should not be encouraged.

3. Essential prerequisite for the success of the program of reconstruction of apartment buildings is solving ownership relations and approval of a qualified majority of co-owners for implementation of measures energy renovation. Also, the new Law on the Market of Thermal Energy (Official Gazette No. 80/13) the installation of individual thermal energy measurement, which is one of the measures proposed for apartment buildings connected to the CTS, becomes imperative for the consumers of heat, eliminating the need for obtaining the consent of all co-owners.

In preparing for this program, the results of the project "Citizen participation in the planning of energy efficiency improvement" (hereinafter referred to as CENEP) have been used. This project is co-financed from IPA and the Ministry of Economy (ME), which is responsible for the overall implementation of energy efficiency policies in Croatia. The project CENEP developed energy efficiency measures that should be implemented in the NEEAP from 2014 to 2016. Due to the support of ME, and the involvement of MoCPP and other government bodies in this project and its acceptance of the final results, the inclusion of the proposed measures in this program is an example of good practice for

individual projects that can contribute to and improvement of the processes of decision making on public policies. The added value is even greater, as this project, through the implementation of a series of workshops and interviewing citizens, found what extent citizens - owners of residential units - accepted as best.

The objectives of this program are as follows:

1. Determine the state of the existing housing stock of Croatia and analyse energy consumption and energy efficiency of the existing housing stock of Croatia;
2. Identify potential and opportunities to reduce energy consumption in existing housing buildings;
3. Elaborate steps of implementation and evaluate the possible effects of measures to encourage improvements of energy efficiency in existing residential buildings.

3.4.2 Regional

While cities voluntarily joined the Covenant of Mayors, counties were obliged to adopt annual plans and triennial energy efficiency programmes in accordance with the Act on Efficient Energy Use in Final Consumption (OG No 127/14) currently in force. In the application period of the 2nd NEEAP, 17 counties and 2 cities drew up and adopted annual energy efficiency plans for final consumption. A total of 11 counties and 1 city drew up triennial energy efficiency programmes for final consumption.

There are several agencies supported by some of the 20 Croatian counties and the City of Zagreb (North-West Croatia Regional Energy Agency (REGEA), Medimurska County Energy Agency (MENE), Regional Energy Agency Kvarner (REA Kvarner), Regional Energy Agency North (REA North), Regional Energy Agency of Istarska County, Development Agency of Varazdinska County (AZRA) etc. These agencies are mainly engaged in preparation of EE projects for the public sector

3.4.2.1 HR Energy Efficiency at Regional Level

In each county, energy efficiency plans for final consumption are being made, with periods from one to three years.

In this plans, state of the art of energy consumption for the region is being discussed, along with measures of energy efficiency to be implemented.

3.4.2.2 HR Urban regeneration at Regional Level

Urban regeneration is being mentioned in measures connected mostly to reconstruction of building for public use. Households, housing stock and energy consumption connected to it is treated separately. In urban planning on regional level, urban regeneration is not yet introduced on sufficient level. Urban regeneration is left to promoting activities of the regional energy agencies. Good example is Regional Energy Agency of North-Western Croatia (REGEA), which cooperates with the city of Zagreb to start the project of urban regeneration of "Donji Grad" neighbourhood. There is a need for communicating and introduction of knowledge transfer and cooperatives on regional level between stakeholders in order to introduce urban regeneration into regional urban development plans.

3.4.3 Local

Thus far, 39 Croatian cities have drawn up SEAPs (48 with municipalities), 11 of which have already been adopted by the project council.

The cities and municipalities which have drawn up SEAPs are: Vinkovci, Brtonigla, Varaždin, Zadar, Ludbreg, Lastovo, Korčula, Mljet, Pirovac, Vela Luka, Donji Miholjac, Beli Manastir, Belišće, Osijek, Poreč, Labin, Brdovec, Samobor, Ozalj, Velika Gorica, Bjelovar, Rovinj, Buzet, Krk, Otočac, Umag, Kastav, Barban, Buje, Grožnjan, Dugo Selo, Opatlj, Križevci, Ogulin, Gospić, Karlovac, Opatija, Pregrada, Slunj, Sveta Nedelja, Duga Resa, Jastrebarsko, Sisak, Koprivnica, Zaprešić, Klanjec, Rijeka, Ivanić Grad, Zagreb.

3.4.3.1 HR Energy Efficiency at Local Level

Measures for increase of energy efficiency and use of RES are integral part of each SEAP. In each larger town or municipality, measures recommended in SEAPs include energy efficiency measures and measures to increase use of RES in order to reduce CO₂ emissions and increase energy self-sufficiency through reduce of fossil fuel consumption.

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The City of Osijek Spatial Plan is at this very moment in the procedure of harmonization and for the first time it will establish and mark the territory of the first Croatian 'green' industrial zone. The project of biogas plant construction for the needs of 'green business' of future tenants is applied to a call for proposal for EU funds, which also financed all the preparatory projects leading up to the establishment of this eco-industrial zone. The project foresees that the energy produced for the companies in the zone will come from RES. A part of City-owned agriculture land is dedicated by the new spatial plan to be used for raising the crops and plants exclusively for clean energy production.

3.4.3.2 HR Urban regeneration at Local Level

Similar to regional level, SEAPs include parts of urban regeneration measures, separately treating building according to use and ownership.

The City of Osijek is currently conducting the procedure of establishing the Urban Agglomeration of Osijek within the newly adopted ITI national strategy. The next step is elaboration of the Urban Agglomeration Strategy with the Strategic Estimate of Environment Impact. It is likely to cause new adaptations both to City and County Spatial Plans.

4 Financial mechanisms

This section identifies the existing financial tools and different financial models, from fully public to public and private finance in the FosterREG project countries (Spain, Netherlands and Croatia) to drive Energy efficiency at urban scale. Some non-public funding experiences are identified also.

A first introduction to European Funds related to FosterREG topics has been made since many of the EE and urban regeneration programs and their actions developed later in Member States are economically supported by these funds.

Many of the EE and National funds are then driven into regional and local level as can be traced in the following sections.

Since EE is the main boost to encourage any retrofitting action, some of the financial mechanisms are identified in EE section. However, most of the retrofitting actions are applied to building scale.

4.1 Europe

EU has published many guides to provide information on EU funding instruments for both Energy Efficiency and urban development. Identified guides are mentioned under the corresponding heading in the following sections.

To ensure that Energy Efficiency and urban development EU policies are implemented, existing funding mechanisms are identified down below.

4.1.1 European Energy Efficiency

DG Energy published a technical guide⁴⁶ about financing the energy renovation of buildings with Cohesion Policy funding. As pointed in the guide its objective is to provide guidance to identify priority intervention areas and strategies to deploy sustainable energy projects in buildings within the Operational Programs and support assessment of financial mechanisms to develop investment projects.

The guide also tackles other EU-wide initiatives for sustainable energy financing such as the Covenant of Mayor's Sustainable Energy Action Plans (SEAPs), explained in section 3.1.1. *European Energy Efficiency*, the CONCERTO initiative, the new Framework Programme for Competitiveness of Enterprises and SMEs (COSME), etc.

The following are some of the EU resources available to tackle Energy challenges:

Horizon 2020 program

The European Research Framework Programme and the Intelligent Energy Europe (IEE) Programme, both followed by the Horizon 2020, were the main schemes used to allocate grants to energy projects.

⁴⁶http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/financing_energy_renovation.pdf

Intelligent Energy Europe (IEE) is now closed but Innovation Horizon 2020 program creates synergies with other EU Funds by fostering innovation skills through ESIF supporting European energy and climate objectives.

Focus areas related to FosterREG topics among the Horizon 2020 program are:

- Energy Efficiency
- Competitive Low-Carbon Energy
- Smart Cities and Communities.

ESI: European Structural and Investment Funds

Article 58 and 59 of the Common Provisions Regulations⁴⁷ (CPR) allow ESI Funds to be used for financing technical assistance and capacity building under certain conditions.

JESSICA: Joint European Support for Sustainable Investment in City Areas⁴⁸

JESSICA allows MS to invest a proportion of their EU Structural Funds to make repayable investments in projects, creating a revolving investment fund for regenerating urban areas as part of an Integrated Plan for Sustainable Urban Development, on the financing of urban Energy Efficiency (EE) and Renewable Energy (RE) project.

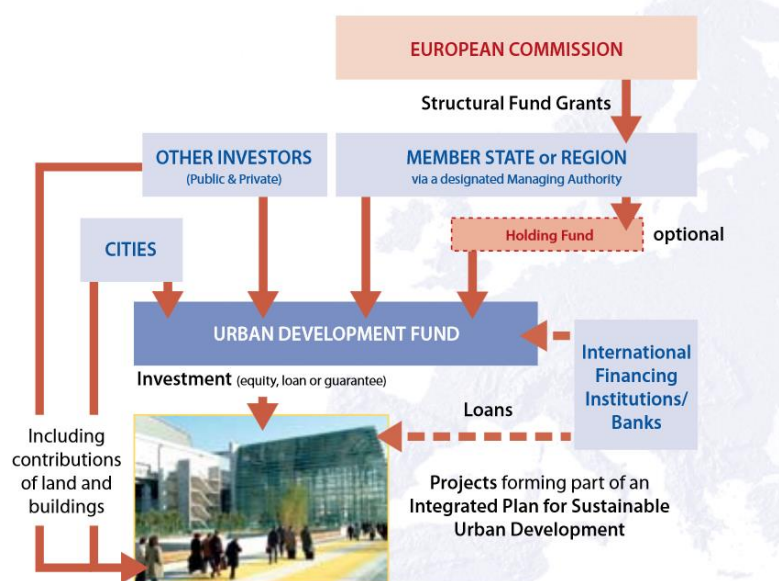


Figure 3 JESSICA funds. Source: BEI(2008): JESSICA. www.bei.org/jessica

ELENA: "European Local Energy Assistance"⁴⁹

ELENA covers up to 90% of the technical support cost needed to prepare, implement and finance the investment programme. This could include feasibility and market studies, programme structuring, energy audits and tendering procedure preparation. With solid business and technical plans in place, this will also help attract funding from private banks and other sources, including the EIB. So whether it is the retrofitting of public and private

⁴⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0320:0469:EN:PDF>

⁴⁸ http://ec.europa.eu/regional_policy/en/funding/special-support-instruments/jessica/#2

⁴⁹ <http://www.eib.org/products/advising/elena/index.htm>

buildings, sustainable building, energy-efficient district heating and cooling networks, environmentally-friendly, transport, etc., ELENA helps local authorities get their projects on place.

RSFF (Risk Sharing Finance Facility)⁵⁰

In 2007 Risk Sharing Finance Facility (RSFF) were launched as part of the FP7 for innovative firms. RSFF is a financing instrument for investment in Research, Development and Innovation in Europe. It finances collaboration between the European Commission and the European Investment Bank (EIB) improving access to the EIB debt finance for participants of European R&D projects. New EU budget has been allocated to expand this funding up to 2020.

JASPERS: Joint Assistance to Support Projects in European Regions

Financed by the Structural and Cohesion Funds, JASPERS provides assistance for various types of projects, including among those urban energy projects, including EE in buildings. It applies to 12 EU countries which joined the EU between the 2004-2007 period, as well as to Croatia, Greece, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia.

It is a technical assistance partnership between the European Commission, the EIB, and the European Bank for Reconstruction and Development (EBRD)

4.1.2 European Urban regeneration

One of the many guides which provide information related to EU funding in urban development is the Smart Cities Stakeholder Platform Finance Working Group Guidance Document⁵¹.

As explained in previous sections the multi-dimensional approach of the territorial strategies has developed new integrating tools under the Common Provision Regulation. Those are the Community-led local development (Article 32-35) and Integrated Territorial Investments (Article 36).

Integrated territorial investments (ITI) allow EU Member States to combine investments from different priority axes and Operational Programmes. The ITI will be implemented through actions on different scales of urban development from the territory to all size of cities and neighbourhoods.

Regional Policy is delivered through three main funds out of the existing 5 European Structural and Investment Funds (ESIF).

- The European Regional Development Fund (ERDF)
- The Cohesion Fund (CF)
- The European Social Fund (ESF).

ITI actions can involve investments from these three funds when they contribute to the thematic objectives of these Operational Programs.

⁵⁰ http://ec.europa.eu/invest-in-research/funding/funding02_en.htm

⁵¹ <https://eu-smartcities.eu/sites/all/files/Guideline-Using%20EU%20fundings%20mechanism%20for%20smart%20cities.pdf>

As pointed in previous sections different areas influence the EU urban strategy and as such financing mechanisms come also from various areas:

Topic	Fund	Program
Regional Policy	The European Regional Development Fund (ERDF)	URBACT programme
		INTERREG Program
		Urban Innovative Actions
	Cohesion Fund (CF)	
	European Social Fund (ESF).	
Environment and climate action	LIFE program	
Research and Innovation	Horizon 2020	

Table 12 European financing sources

At least an estimated 50% of the European Regional Development Fund (ERDF), around 80-90 billion Euro, will be invested in urban areas through the mainstream operational programmes in the 2014-20 financial period and a minimum of 5% of national allocations of ERDF have been earmarked for integrated sustainable urban development to ensure that it is a priority in all Member States⁵²

In addition, the Commission will establish a platform of urban development and foresees that the ERDF will support innovative actions in the field of urban development sustainable "to identify or test new solutions in response to issues of sustainable urban development of interest for the Union" (article 9).

Within the priorities of the future framework of the ERDF (article 5) investment, urban regeneration is specifically identified in the following areas:

- promoting low-carbon strategies in particular for urban areas
- improvement of the urban environment, to revitalize cities
- providing support for physical, economic and social regeneration of deprived communities in urban and rural areas;

URBACT III (2014-2020)⁵³ Operational programme following the previous URBACT I and II continues to promote sustainable integrated urban development and contribute to the delivery of the Europe 2020 strategy. The total budget eligible budget of URBACT III is 96,3 M€. City networking and exchange will continue to be promoted by the next generation URBACT21 programme.

One of the key priority areas of the ERDF fund is the low-carbon economy and special focus is put on sustainable urban development through the development of 'Integrated actions' managed by cities.

Cohesion Fund support projects related to energy and energy efficiency form the environment point of view but they are only eligible for certain Member States (nor Spain nor Netherland are included)

⁵² Article 7 of REGULATION (EU) No 1301/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006

⁵³ <http://www.urbact.eu>

The LIFE programme is the EU's funding instrument for the environment and climate action. LIFE should promote implementation and integration of environment and climate objectives in other policies and Member State practice, including mainstreaming, by the creation of two sub-programmes:

- LIFE sub-programme for Environment, including as priorities areas environment and resource efficiency, nature and biodiversity, and governance and information
- LIFE sub-programme for Climate Action, including as priorities areas adaptation, mitigation and governance and information

The DG Environment and DG Climate Action manage the LIFE programme⁵⁴. The Commission has delegated the implementation of many components of the LIFE programme to the Executive Agency for Small and Medium-sized Enterprises (EASME). External selection, monitoring and communication teams provide assistance to the Commission and EASME. The European Investment Bank will manage the two new financial instruments:

- NCFF: The Natural Capital Financing Facility is a new financial instrument which will provide financing opportunities in the form of loans or equity investments for revenue-generating or cost-saving pilot projects promoting the preservation of natural capital, including climate change adaptation projects.
- PF4EE: Private Finance for Energy Efficiency instruments is a new financial instrument which will provide loans for investments in energy efficiency projects prioritised by National Energy Efficiency Action Plan.

4.2 Spain

Level	Fund/program
SPAIN	ERDF 2014-2020 <ul style="list-style-type: none"> • Operational Programme of Intelligent growth (POCI)- plurirregional <ul style="list-style-type: none"> ◦ Spanish Digital Agenda ◦ National Plan of Intelligent cities • Operational Programme of Sustainable growth (POCS) - plurirregional <ul style="list-style-type: none"> ◦ Integrated strategies of sustainable urban ◦ Low carbon economy individual actions (IDAE) Clima Project
BASQUE COUNTRY	Operational Programme of Regional SPRI; EVE; GipuzkoaIKT

4.2.1 National

4.2.1.1 ES Energy Efficiency at National Level

Contributions from the European Regional Development Fund (ERDF) are allocated to Urban Development Funds (UDFs) and together with the amount corresponding to the

⁵⁴ http://ec.europa.eu/environment/life/funding/financial_instruments/pf4ee.htm

national co-financing⁵⁵. This fund is created by the collaboration of JESSICA (Joint European Support for Sustainable Investment in City Areas) and F.I.D.A.E.(Diversification and saving of energy investment fund _ Fondo de Inversión en Diversificación y Ahorro de Energía in Spanish)

It only applies to 8 Spanish regions and the Basque County is not included among those.

Bilbao Vizcaya Argentaria Banc (BBVA) was selected as the financial institution responsible for the management of the funds. Costs directly related to the generation of renewable energy or increment of energy efficiency is eligible.

Nature	Type	Title	Issuing body	Open call
PUBLIC	DIRECT NON-REFUNDABLE AID AND REIMBURSABLE LOANS	Programme of Aid for Energy Rehabilitation of Existing Buildings (PAREER-CRECE programme)	IDAE	2015

Table 13 Public Spanish National EE financing sources

Programme of Aid for Energy Rehabilitation of Existing Buildings (PAREER-CRECE programme)

The Ministry of Industry, Energy and Tourism, through the Institute for Energy Diversification and Savings (IDAE), set up this programme to incentivise and promote alterations that promote energy saving, improvements in energy efficiency, harnessing of renewable energy and reduced carbon emissions in existing buildings, whatever their use and the legal nature of their owners, and to contribute to achieving the energy efficiency targets set in Directive 2012/27/EU and the 2014-2020 Action Plan, while at the same time creating opportunities for growth and employment in different industries, particularly the building industry, promoting urban regeneration.

4.2.1.2 ES Urban regeneration at National Level

ERDF Integrated and Sustainable Urban Development

The Association Agreement of 2014-2020⁵⁶ between Spain and the European Commission, set not to use ITIs for the regeneration of degraded neighbourhoods, and therefore this figure is reserved for the moment for strategies of territorial scale (Atlantic Strategy, Strategy of integrated management of coastal zones in the Mar Menor, etc.). However, the ERDF's Operational Programme for Sustainable Growth included the integrated approach to the figure of the "integrated actions of urban sustainable development ", allocating 5% of the ERDF budget.

This program will be developed through competitive calls to which municipalities can compete directly by presenting an integrated strategy over a limited territory, with a clear diagnosis of the problems and a proposal validated by a public participation process.

⁵⁵ <http://www.idae.es/index.php/id.858/mod.pags/mem.detalle>

⁵⁶ http://www.dgfc.sqpg.meh.es/sitios/dgfc/es-ES/ipr/fcp1420/p/pa/Documents/20141022_AA_spain_2014_2020.pdf

Aids to the program of the National Plan of development of rental housing, building rehabilitation and regeneration and urban renewal, 2013-2016

The Spanish National Government Plan for the promotion of rental housing, building refurbishment and urban regeneration provides funds to public and private owners through a set of varied subsidies managed by regional authorities. First, each regional government must sign a partnership agreement with the National government defining the aid policies to apply in their territories, the total investment in each of the programmes and the planned schedule of the expenditure. Afterwards funds are transferred to regional governments, which are responsible for allocating the subsidies according to the partnership agreement. Finally, National government carries out an audit of all the process.

4.2.2 Regional

4.2.2.1 ES Energy Efficiency at Regional Level

Nature	Type	Title	Issuing body	Open call
PUBLIC	DIRECT NON-REFUNDABLE AID	Aid programmes for energy efficiency and renewable energy sources	EVE	2015
	DIRECT NON-REFUNDABLE AID AND REIMBURSABLE LOANS	RENOVE Housing Rehabilitation Plan 2013-2016	ETXEBIDE	2015

Table 14 Basque Country's Public EE financing sources

Aid programmes for energy efficiency and renewable energy sources⁵⁷

Call 2015: €12m in aid for introducing energy efficiency and renewable energy in strategic industries

Of particular interest are the industrial sector, transport, the tertiary sector, public authorities and technologies for harnessing biomass, solar thermal and geothermal energy.

It is planned to achieve energy savings of over 40,000 toe (tonnes of oil equivalent), equivalent to the energy consumption of 66,000 homes, corresponding to a 0.6% reduction in Basque energy demand.

These grants are compatible with aid from the IDAE.

RENOVE Housing Rehabilitation Plan 2013-2016

The main objective of the Renove Housing Rehabilitation Plan 2013-2016 is to increase the energy efficiency of homes and buildings, improve conditions of accessibility, reinforce

⁵⁷ <http://www.eve.es/Programas-de-ayuda/Eficiencia-Energetica-y-Energias-Renovables-en-el.aspx>.
http://www.etxebide.euskadi.eus/x39-contgen/es/contenidos/informacion/ayud_rehab_renovate/es_etxecont/ayud_rehab_eficient.html

social cohesion and incentivise job creation. This plan is further explained in next section related to urban regeneration.

Energy efficiency is one of the main areas of underperformance in residential buildings. In order to address this issue, the Renove Housing Rehabilitation Plan 2013-2016, framed within the Europa 2020 Strategy, seeks to promote a low-carbon economy that will meet the targets of reducing carbon emissions by 20%, cutting energy consumption by 20% and increasing the use of renewable energy by 20%.

Others

Nature	Type	Title	Issuing body	Open call
PRIVATE	REIMBURSABLE LOAN	Home alterations loan	KUTXABANK	2015
	FINANCING VIA ESCOS	Achievement of energy savings	-	-

Table 15 Basque Country's Private EE financing sources

Home Alterations loan⁵⁸

Kutxabank (Basque savings banks) offers The Home Alterations loan; up to €60,000 in credit to make improvements or repairs to your home.

Financing via ESCOS

Directive 32/2006/EC states that an ESCO is a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. Payment for the service it provides is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria.

Although there are other contract models, it is worth mentioning the Energy Performance Contract (EPC) system, under which the ESCO and the customer come to a contractual arrangement to introduce energy efficiency improvement measures, where investments in those measures are recovered by means of the expected savings from the contractually agreed level of energy efficiency improvement.

In short, under an EPC, the ESCO examines the installation, assesses the level of energy savings that might be achieved and offers to implement the project, guaranteeing those savings during the agreed period.

4.2.2.2 ES Urban regeneration at Regional Level

Regional Tax offices – special tax incentives for building refurbishment works⁵⁹

There are specific tax incentives for those tax payers undertaking refurbishment works. Specific incentives in Bizkaia (province where Bilbao are located) are mentioned in the personal income taxes regulations of December 5th of 2013.

⁵⁸https://kutxa.kutxabank.es/cs/Satellite/kb/es/mayores/vive_con_tranquilidad/prestamo_reforma_hogar/pys

⁵⁹http://www.bizkaia.eus/ogasuna/zerga_arautegia/indarreko_arautegia/pdf/ca_13_2013.pdf?idioma=CA#page=73

Operational Programme 2014-2020 ERDF Basque Country

The operational programme identifies a number of priority investments, and actions that will be financed within a specific priority include improving energy efficiency, intelligent energy management and renewable energy use in public infrastructures, including public buildings, and in the homes of the Basque Country. More specifically, it mentions actions for efficient rehabilitation of housing, aid programs in the field of efficient rehabilitation of homes and buildings that include activities such as improving the envelope of buildings, incorporation and / or improved thermal production facilities, installation of energy monitoring systems, improved systems air conditioning, hot water, etc.

Plan RENOVE, Renewal Plan 2013-2016

The renewal is articulated through five programs:

- Funding programme to help individuals and communities of property owners for the rehabilitation of buildings and homes.
- Funding programme to improve accessibility, form municipalities and local governments.
- Grant scheme for building conservation in Integrated Rehabilitation Areas or Residential Areas Degraded heritage.
- Grant scheme on efficient rehabilitation of homes and buildings for projects conserving building heritage.
- Grant program for urban regeneration (REVIVE program)

The programme has as main objective to support urban regeneration in selected areas with particular urban and social characteristics. The selected areas for the period 2013-2016 within the Bilbao metropolitan area are:

- Área de Txabarri -el Sol, Sestao.
- Área de Sarratu, Basauri.
- Área de Peñasal (Iturrigorri-Gardeazabal), Bilbao.
- Área Plaza Corazón de María, Bilbao.
- Área de San Juan, Santurtzi.
- Santa Juliana, Abanto.

The beneficiaries of the grants are the city councils and the Public Societies for Urban Regeneration.

4.2.3 Local

4.2.3.1 ES Energy Efficiency at local level

Funding related to Energy Efficiency at local level apply to those areas managed by Surbisa, the most degraded areas of Bilbao.

Neighbour communities that go beyond an usual and required maintenance rehabilitation are eligible for financing of 10% of works. These Energy efficiency measures are in most cases improvement of the thermal insulation of the envelope (facade or roof); no installation of solar panels or geothermal have been performed

4.2.3.2 ES Urban regeneration at local level

The general framework comes from the Basque Government Decree 317/2002 on protected rehabilitation activities Urbanized and Built Heritage and from the Basque Government Order of December 17, 2014, for which the corresponding call 2015 regulates the Renewal Program efficient rehabilitation of homes and buildings for the development of projects of intervention in the built heritage of the Basque Country and execution of derivative works thereof.

In addition to this, the Bilbao City Council adds additional aid for the rehabilitation of defined areas:

- Line 1: Vulnerable families that must undertake rehabilitation of the building or to acquire basic and necessary living conditions in their houses works by Basque Government Decree 317/2002. Weighted persons or families whose annual income is equal to or less than € 21,000.00., Subsidies will be 15% of the eligible budget for construction of the common elements, plus you can access a support of 10% of budget protectable works living conditions in the home.
- Line 2: Security in buildings, affecting facades and eaves, widespread damage to the supporting structure and pathologies of building elements, facilities in disrepair, and the absence of living conditions. The grants will be for the Owners Community of 10% of eligible budget and not exceed € 12,000.
- Line 3: Accessibility line both from the street to each of the houses, and for elevator installation and removal of architectural barriers. The grants will be for the Owners Community of 10% of eligible budget and not exceed € 20,000.
- Line 4: Strategic projects in groups of buildings, in unique environments or in areas of special interest, improvement of the urban image, and for implementing energy efficiency measures and sustainable rehabilitation.

The grants will be for the Owners Associations of 10% of the eligible budget and cannot exceed € 35,000.

Income < / = € 15 000	€ 9,000
Income < / = € 21 000	€ 5,500
Income < / = € 33 000	€ 3,000
Income > € 33,000.....	€ 3,000
For legal persons	€ 3,000

The aid is compatible with those covered by other entities although the total aid received may not exceed 70% of the eligible budget. This limitation does not apply to actions in housing Line 2.

4.3 Netherlands

4.3.1 National

4.3.1.1 NL Energy Efficiency at National Level

SVn – Stimulation fund for housing

SVn is an independent financial partner (not for profit) for local and regional governments, housing corporations or other market parties in the housing sector. It originated from the Building Fund, which was then owned by the municipalities. Among other things, SVn manages the revolving funds for energy saving measures like those in the Housing agreement, contributing to quality improvement of the built environment in cities and towns. Relevant funds include:

- Stimulation fund: the terms and conditions of these loans are determined by the municipality or the province and may be used to promote energy efficiency if other financial concepts do not fit the local situation. The loan is paid directly to the construction companies. It is a revolving fund: interest and repayments go back into the fund to be re-invested again. It can be applied for residents, local businesses and homeowners' associations.
- National energy savings fund: this fund is a direct consequence of the aforementioned Housing Agreement and aims to stimulate homeowners and homeowners' associations to take energy efficiency measures, which ultimately contribute to a comfortable and energy efficient dwelling with a lower energy bill and a more stable value. Depending on the current situation and the selected measures off the list, the energy efficiency benefits may even cover the monthly loan costs. Measures that may be financed out of this fund include a.o. insulation, heat recovery systems, PV panels and solar boilers, heat pumps, (micro-)CHP. If the loan includes PV panels, these may contribute up to 75% of the total loan; the other 25% needs to be invested in other measures. For homeowners' associations the terms are a bit different due to the larger sums of money involved and the more extensive decision-making process required. The fund is €300 mln with a national government contribution of €75 mln. Two banks co-finance the other €225 mln. This is a revolving fund, available nationwide. The loan is paid directly to the construction companies. (<https://ikinvesteerslim.nl/over-ons>)

In 2015, 1100 applications were sent in for a total of €12 mln in the months January-May: this increase compared to starting year 2014 is probably due to the preliminary energy labels and adaptations to the conditions and procedure of the loan.

(<http://www.parlementairemonitor.nl/9353000/1/j9vvij5epmj1ey0/vjveefbvzozs>)

- Sustainability loan: improving the energy efficiency of the housing stock is an important goal for municipalities in relation to the European energy targets. The sustainability loan is a financial incentive to invest in an energy efficient dwelling with a low interest rate, intended for homeowners. Since the sustainability loan is a local instrument the municipalities can determine the conditions of the loan (e.g. measures, neighbourhoods, maximum values etc), within certain boundaries. The loan is paid directly to the construction companies.

<https://www.svn.nl/Paginas/Home.aspx>

Stimulation of Sustainable Energy Production⁶⁰. SDE+

The SDE+ (Stimuleren Duurzame Energieproductie/Encouraging Sustainable Energy Production) is an operating grant. Producers receive financial compensation for the renewable energy they generate. Production of renewable energy is not always profitable because the cost price of renewable energy is higher than that of energy derived from

⁶⁰ <http://www.rvo.nl/subsidies-regelingen/stimuleren-duurzame-energieproductie-sde>

fossil fuel. The difference in cost price is called the unprofitable component. SDE+ compensates producers for this unprofitable component for a fixed number of years, depending on the technology used.

The SDE+ is available for the production of:

- renewable electricity
- renewable gas
- renewable heat or a combination of renewable heat and electricity (CHP)

The primary target groups for SDE+ are companies, institutions and non-profit organizations. The project must be realized in the Netherlands. The national government is excluded from participation. Private producers of renewable energy are not eligible for a SDE+ grant because the costs exceed the benefits. Other local or national incentive regulations sometimes apply.

In 2015 3,5 G€ available for subsidies in renewable generation of electricity/production of other energy carrier (such as hydrogen or methane). Stimulus/support for Wind energy depends on relative (average) wind speeds (more subsidy if efficiency is expected to be higher)

Introduced in 2015: possibility to do banking in order to transfer ` (above the subsidisable ceiling) efficiency through to an upcoming next year. The "surplus" of generative capacity remains eligible for additional subsidies in that later year.

Net Metering⁶¹

Net Metering (in Dutch referred to as 'salderen') was introduced in 2004 to promote decentralized sustainable energy production for small scale consumers. It is a service by which the excess of electricity energy generated by a consumer (with a connection capacity for electricity up to 3x80 ampere) from an sustainable eligible on-site generating facility (f.e. PV panels, windmill) can be fed into the distribution grid and is subtracted from the electricity supplied by the energy supplier. Until maximum of 5000 kWh/year the feed-in tariff (including taxes and transport costs) is equal to the tariff the consumers pays at moments it uses electricity from the grid. The energy taxes (tax, ODE and BTW) are thus only calculated over the net electricity consumption, which is the difference between the consumed electricity and the electricity fed back into the grid, so they receive an exemption on the net-metered electricity. The national government has guaranteed this mechanism will remain at least until 2020.

Sustainable Energy Tax⁶²

In 2013, a new levy was introduced on energy, a sustainable energy tax (in Dutch referred to as 'Opslag Duurzame Energie'(ODE), as well recorded by the 'Wet belastingen op milieugrondslag'. The goal of this taxation is to stimulate investments in sustainable energy projects. By means of this levy, the exploitation subsidy program SDE+ (Stimulerend Duurzame Energie +, Renewable Energy Production Incentive Scheme) and Net Metering is financed. As with the energy tax in the Netherlands, the surcharge is

⁶¹<http://www.rvo.nl/onderwerpen/duurzaam-ondernemen/duurzame-energie-opwekken/duurzame-energie/saldering-en-zelflevering>

⁶²[http://wetten.overheid.nl/BWBR0032660/geldigheidsdatum_15-09-2015\](http://wetten.overheid.nl/BWBR0032660/geldigheidsdatum_15-09-2015)

levied per kWh by means of a regressive tax system.. In 2013 the budget of the SDE+ amounted to € 100 million (€ 57 MM on electricity and € 43 MM on gas), in 2014 the budget is € 200 million and in 2015 this will be € 300 million. Aiming to reach a budget of € 1,4 billion in 2028. This entails that the rate of this sustainable energy tax will significantly rise each year. Expected is an increase of € 8 on the energy bill of an average household in 2013, rising to an increase of € 25 in 2015, up to about € 120 in 2028.

Postcoderoos⁶³

Tax deduction measurement for housing co-operations and or collective owners of a multi-apartment building. The measurement provides a deduction on energy tax in order to stimulate investments in local privately owned generative capability. In practice there is harsh critic for the complicated and poorly effective method of stimulation. Specifically the way in which an energy service providing company must be part of the construction is a major obstacle, because there is no real inherent drive to cooperate for these parties. The energy companies quite simply have little to earn from these co-operations, but do have to invest time and provide administrative services. Still they can be interested to go along, simply to get on the learning curve. This way, new routes to profitable services for the energy market may be found. New initiatives like the cooperation of "Zon op Nederland" and Greenchoice provide possibilities for any local renewable energy initiative to start their own postcode-rose project. In the fall of 2015 a commission chaired by Ed Nijpels (former minister) will evaluate the current postcode rose arrangement. Quite likely this will be the beginning of a more efficient approach

The area in which the arrangement applies is the so called 4-digits postcode PLUS the neighboring postcode areas. This can best be explained with the following example:

Presume, there is a local renewables project in postcode area 8233 (in reality a part of Lelystad). In that case participants in the project that are living in neighbouring postcode areas, can reclaim part of the energy tax they paid. That would in this example apply to participating citizens in postcode areas: 8231, 8222, 8211, 8212, 8224 and of course the own postcode area, namely 8223.



Figure 4 Map showing the various postcode areas surrounding central area 8223 where a renewable energy project is presumed in the given example

Energiesubsidiewijzer⁶⁴

⁶³ <http://www.postcoderoos.com/>

⁶⁴ <http://www.energiesubsidiewijzer.nl/>

On the portal “Energiesubsidiewijzer,” an up to date overview of available Dutch subsidies is presented for anyone interested in the matter. The portal was installed within the framework of the “Meer met Minder” (more with less) campaign of the ministry of economic affairs.

If local government (municipalities and or provinces) have any form of subsidy and produced the information to this portal, also local subsidies can be found. At present (overview last updated on 2015 July 8) some 190 subsidy arrangement can be found on the site. Only a small fraction applies for a given initiative in a certain location however. The appealing feature is that all applicable stimulation measures can be found at one spot so that feasibility of a certain investment in energy efficiency or renewable generation can be assessed immediately. In case there is any overlap or mutual exclusion of arrangements, the most favorable one can be found quickly.

4.3.1.2 NL Urban regeneration at National Level

There are no financial mechanisms for urban regeneration identified at nation level

4.3.2 Regional

4.3.2.1 NL Energy Efficiency at Regional Level

Tender Portfolio Energy Guarantee⁶⁵

One of the iconic projects is the “Tender Portfolio Energy Guarantee”. The province of Utrecht feels that collective energy projects, for example by private homeowners’ associations or energy cooperation’s, deliver a valuable contribution to reducing the CO₂-emissions and a better climate. Financing those projects can be difficult. Therefore the province has challenged the banks by means of the tender portfolio energy guarantee to address this issue, in order to help these collective energy projects to get the needed financing. In this way, the banks get an additional guarantee from the province for the collective energy initiatives they fund, to reduce their credit risk. The credit risk is relatively high because banks are relatively new to these type of projects and how to allocate the risk to individual members within a collective? A local bank has gained the right to use the provincial guarantee for 2 million euros. In exchange, the bank is willing to finance for 10 million euros of energy projects.

Moreover, the province helps initiators to build a good business case before they go to the bank. Often, specific fiscal and legal knowledge is needed to a good business case and submit a successful loan application. Via the province, initiators may obtain process support to help with this.

4.3.2.2 NL Urban regeneration at Regional Level

There are no financial mechanisms for urban regeneration identified at regional level

<http://www.energiesubsidiewijzer.nl/promotiemateriaal/totaaloverzichtweek282015.pdf>

⁶⁵

<https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/duurzaamheid/virtuele-map/icoonprojecten/icoonprojecten/tender-portfolio/>

<https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/kennis-innovatie/garantiefonds/>

4.3.3 Local

4.3.3.1 NL Energy Efficiency at Local Level

Sustainability loan⁶⁶

The sustainability loan is a financial incentive to invest in an individual energy efficient dwelling with a low interest rate, intended for homeowners. Measures that may be financed out of this fund includes a.o. insulation, heat recovery systems, PV panels and solar boilers, heat pumps, (micro-)CHP. The fund is currently €800,000 and can be expanded to maximum € 2 mln. The loan is paid to the home owner. The maximum loan per house is € 25,000.

Retrofit loan⁶⁷

The Retrofit loan is a financial incentive to invest in retrofitting a group of houses. The projects are indicated by the local administration. Measures that may be financed through this fund includes sustainability measures as well as house improvement measures (e.g. constructional improvements). The fund is currently €1,000,000 and can be expanded to maximum € 2 mln. The loan is paid to the home owner. The maximum loan per house is € 45,000.

Solar power support⁶⁸

A grant for households that want to take collective action to use solar power. Minimum size is 10 households or 15,000 Wp solar power. The grant can be used for project costs, communication, consultancy, feasibility studies, etc. The total amount of the fund is € 50,000. The maximum grant is € 20,000.

Zero-sum retrofitting⁶⁹

A pilot for the first 10 zero-sum retrofitting. The house is retrofitted to a zero energy house. The total costs of investment must be equal to or lower than the current energy bill. A standard household has an energy bill of €175/month. At current interest rates this means that the investment must be around € 45.000. Current building costs for this type of retrofitting is € 60,000.

Municipality of Utrecht offer an innovation grant for the construction company (€ 15,000 per house) and project support for the house owner (€ 4.000/house).

4.3.3.2 NL Urban regeneration at Local Level

There are no financial mechanisms identified at local level

⁶⁶ <http://www.utrecht.nl/utrechtse-energie/bewoners/de-gemeente-helpt-u/duurzaamheidslening/>

⁶⁷ <https://www.svn.nl/producten/Stimuleringslening/Utrecht/Paginas/WatIsHet.aspx>

⁶⁸ <https://pki.utrecht.nl/Loket/prodcat/products/getProductDetailsAction.do?id=1160>

⁶⁹ <http://www.utrecht.nl/utrechtse-energie/bewoners/de-gemeente-helpt-u/actie-nul-op-de-meter/>

4.4 Croatia

4.4.1 National

The Environmental Protection and Energy Efficiency Fund (*hereinafter: EPEEF*) was established by the Act on the Environmental Protection and Energy Efficiency Fund (NN Nos 107/03, 144/12) in 2003 as a non-budgetary fund with the status of a legal person with public authority, with the objective of raising earmarked funds for financing the preparation, implementation and development of programmes, projects and similar activities in the field of environmental preservation, sustainable use of the environment, environmental protection and amelioration; the participation in financing national energy programmes aimed at improving energy efficiency, the use of renewable energy sources, as well as organising and implementing a management system for special categories of waste.

EPEEF is a national Fund, whose establishment was proposed in Article 20 of the EED, and it is competent for financing the implementation of the energy policy of the Government of the Republic of Croatia in regard to energy efficiency improvements and increasing the use of renewable energy sources. The Fund co-finances energy efficiency programmes and projects in accordance with the Energy Strategy of the Republic of Croatia (NN No 130/09), the National Energy Efficiency Programme for the 2008–2016 period, national energy efficiency action plans, as well as other programmes derived from the aforementioned strategy documents adopted by the ministries competent for energy, construction, environmental protection and transport. In addition to the Act on the Environmental Protection and Energy Efficiency Fund, the Fund's activities regarding energy efficiency are also regulated by the Act on Efficient Energy Use in Final Consumption (AEEU; OG No. 127/14) which, in Article 6, provides that the Fund shall ensure financing for the implementation of energy efficiency improvement measures laid down in the NEEAP currently in force.

EPEEF is primarily financed with funds obtained from the auction sale of emission units derived from the quotas allocated to plants in Croatia, in accordance with the Air Protection Act (NN Nos 130/11, 47/14).

4.4.1.1 HR Energy Efficiency at National Level

The Tariff system for the production of electricity from renewable energy sources and cogeneration (OG No 33/07) and the Decree on incentive fees for promoting electricity production from renewable energy sources and cogeneration (OG No 33/7) lay down the mechanisms for the collection and distribution of funds for supporting electricity producers who use RES and cogeneration. The Decree on the minimum share of electricity produced from renewable energy sources and cogeneration whose production is incentivised (OG No 33/07, 08/11) lays down the national targets for increasing the share of RES and cogeneration in total electricity consumption, to be provided by suppliers and offered to customers by 2020. The target for cogeneration is 4 % of electricity from incentivised production in total final electricity consumption.

There are currently ten eligible producers in the system of incentives who are receiving incentives for cogeneration, with 51.64 MW of total electric power and 88 MW of thermal power.

The new Tariff system for renewable energy sources and cogeneration was issued in October 2013, laying down higher incentives for cogeneration plants. Furthermore, efficient cogeneration is additionally stimulated with the corrective factor which differentiates three degrees of efficiency for produced electricity and useful heat:

- for production plants that achieve overall annual efficiency lower than 45%, the corrective coefficient is 0,9;
- for production plants that achieve overall annual efficiency higher than/including 45% and lower than/including 50%, the corrective coefficient (k) is 1;
- for production plants that achieve overall annual efficiency higher than 50%, the corrective coefficient (k) is 1,2.

A higher price stimulates eligible producers to consider channelling the largest possible share of heat energy into safe consumption when designing cogeneration plants.

Most EE measures are co-financed by EPEEF but, in addition to certain ministries and EPEEF, there are also other financial models, fees and financial institutions which participated in the co-financing of measures of the 2nd NEEAP and their further involvement in the measures of the 3rd NEEAP is expected. The most prominent of the aforementioned are the following

Croatian Bank for Reconstruction and Development (HBOR)

Since its establishment, the Croatian Bank for Reconstruction and Development, in its role as the national development bank, directed its efforts towards financing sustainable projects which protect the environment and improve energy efficiency, as well as projects involving renewable energy sources. In the 2007–2013 period, HBOR approved approximately HRK 1.213 million of loan funding intended for investments in environmental protection, renewable energy sources and energy efficiency projects. Of the aforementioned amount, HBOR approved approximately HRK 98.4 million of loan funding for energy efficiency projects in the 2011–2013 period. The aforementioned HBOR loan funding was approved through business banks operating in the Republic of Croatia, directly through HBOR, and through the risk distribution model in cooperation with business banks.

Moreover, based on the multi-annual successful cooperation with the EIB, HBOR currently also has European Commission funds at its disposal for financing projects on energy efficiency and renewable energy sources, and such funds can be used when approving HBOR loans from EIB funds.

Commercial banks

The lines of credit at Zagrebačka banka and Privredna banka Zagreb can serve as examples of how commercial banks embraced EE measure financing in a broader scope. These are only examples of good business practice, by no means the only ones implemented in the Republic of Croatia. Many commercial banks offer similar lines and models, or are actively working on their development.

Public-private partnership

The first public-private partnership agreements in the Republic of Croatia were concluded in 2006 and 2007. It was a contractual type of public-private partnership, the private

finance initiative model (PFI model), mostly in the domain of school construction. In addition to the PFI model, the concession model was predominantly used in public-private partnership projects, and the institutional type of PPP was featured in addition to the contractual type. The Agency for Public-Private Partnership has registered 13 implemented PPP projects in Croatia thus far. The projects have predominantly been carried out on the construction of school facilities (9), one bus terminal, county building and sports hall. The total value of these projects is HRK 614.250.000. PPP projects are also implemented by the Centre for Monitoring Business Activities in the Energy Sector and Investments, in the name and on behalf of the state bodies of the Republic of Croatia. One of the initial steps in the preparatory stage of PPP project implementation is to request the PPP project applicant to submit the project documentation for the proposed projects. In order to meet the requirements of the upcoming EU laws and rules on energy efficiency, the status of project documentation for the proposed projects is recorded with regard to the requirements set by the Ministry of Construction and Physical Planning. These guidelines are stricter than the maximum permitted values laid down by the law which is currently in force, whereby PPP projects result in an increase of energy efficiency. The prescribed stricter requirements include the maximum permitted heat transfer coefficient (U), the maximum permitted annually required heat energy for heating ($Q_{h,nd}$), and mandatory insulation protection.

ESCO

The strengthening of the market for 'Energy services' offered by private companies and higher absorption of funding from structural funds for energy efficiency projects is expected in the following period. Experience in implementing energy efficiency projects has shown there was a need for establishing guarantee mechanisms. Although in some cases ESCO companies may have the credit ability to finance projects providing energy services, without a guarantee mechanism or other financial instruments the overall market potential is reduced and fewer projects can be financed. The risk to reward ratio in energy efficiency projects, although the financial flow is positive, does not justify investments in full renovation of buildings, which greatly reduces the savings potential and the investment levels of ESCO companies. Borrowing from banks is also problematic, conditioned by two main reasons:

1. As a rule, an energy efficiency improvement project entails an investment by an entrepreneur on someone else's property, which does not provide a guarantee in form of a mortgage to the financial institutions.
2. Revenues are based on technically conditioned obligations, and the banks do not possess sufficient specialist knowledge to conduct an acceptable risk analysis.

In order to overcome these issues, in addition to the aforementioned lines of credit, the development of three new mechanisms for the utilisation of financial instruments is planned:

1. Guarantee programmes which will cover specific risks related to the implementation of energy efficiency programmes. The objective of guarantee instruments is to assume some of the risk incurred by the financial institutions which finance ESCO companies, with the payment of

- a fee which would not amount so high as to jeopardise the financing of the project.
2. Equity instruments which will ensure co-investments through the financial instrument, whereby the public co-investor would have limitations in generating profit, i.e. excess profit would be transferred to the private partner. The use of this instrument will increase the attractiveness of investments in projects with lower profitability rates/return on investment period.
 3. Mezzanine financing – by combining the aforementioned instruments, we intend to form programmes and institutions with private investors, and such institutions would assume risks through specialised mezzanine financing (subordinated borrowing) for energy efficiency projects.

There is a possibility of establishing forfeiting products as a financing method, if acceptable discount rates are achieved. For that reason, forfeiting is not planned to be used for integral project financing, but only as a support product for planned financial instrument mechanisms.

Financing by way of CO₂ and other emission fees

A special measure of a financial nature involves funds collected by way of CO₂ and other emissions, previously specified under measure I.5. The full title of the measure is: Financing energy efficiency programmes with funds obtained from the auction trade of greenhouse gas emission units, the CO₂ emission fee for polluters, and the fee for plants excluded from the emission unit trade. What follows is the description of the measure:

Plants in Croatia have been included in the EU Emissions Trading System from 1 January 2013. The ETS system participants from Croatia can buy emission units at auction, and access to auctions is open for all market participants regardless of their state of origin. The funds obtained from the auction sale of emission units that originate from the quotas set for plants in Croatia are paid into a special account of the Environmental Protection and Energy Efficiency Fund.

The allocation of funds will be determined on the basis of the Plan, and the Plan will be used to set, calculate and allocate the funds received from the auction sale of emission units per area, for the 2014–2016 period. A plan for the allocation of funds per area and measure will be designed. The amount of funding required for implementation will be evaluated for each measure, as will the stakeholders/executors of the measure and the dynamic of implementation. In the course of designing this Plan, the need to harmonise it with the 3rd National Energy Efficiency Action Plan will be taken into account. This measure will be executed by EPEEF, with the supervision and monitoring by MENP, and EPEEF will direct a portion of the funds received from CO₂ fees and auctions into co-financing energy efficiency projects in industry.

EPEEF should continue evaluating investments and emission reduction programmes for CO₂ fee tributaries. In accordance with the aforementioned Decree and Act, EPEEF supervises the implementation of CO₂ emission reduction programmes and draws up a report on the utilisation of funds received from auctions.

This measure is a combination of a voluntary approach based on the reduction of CO₂ fee payments, the utilisation of funds collected from the fee for co-financing industry projects,

and the utilisation of funds received from auctions for financing measures on increasing energy efficiency in building construction. In view of past experiences and great savings potentials, a total of 1 PJ of energy savings is set as a target to be achieved by 2016. In view of the characteristics of industry measures and their relatively long life cycle, it is assumed that all the savings will still be producing results in 2016 and 2020. Special attention will be paid to **building construction** which, according to estimates, accounts for 43 % of final energy consumption. When selecting energy efficiency measures, maximising the reduction of CO₂ emissions will be taken into account, i.e. priority will be given to measures with the lowest marginal costs per tonne of avoided CO₂ emissions.

4.4.1.2 HR Urban regeneration at National Level

The program of reconstruction of apartment buildings predominantly proposed financial measures - subsidies - for equipment and works to enhance energy performance of existing buildings. These types of measure are the most acceptable to the citizens and are therefore expected to achieve the best results.

Sources of funding proposed for the implementation of this program are:

EPEEF

EPEEF is obliged under the Law on Energy Efficiency (Official Gazette No. 127/14) secure resources necessary for the implementation of activities defined by the program, because it is an elaboration of measures from the 2nd NEEAP. Means to achieve the objectives defined in this program exceed the capability of the Fund and it is therefore necessary to use other sources.

EU Structural Funds

EPEEF is the central institution for the management of EU funds, and these funds can be used as a source of funding for co-financing the implementation of the Programme;

An essential prerequisite for the use of EU funds is the integration of these measures in the Operational Programmes under the authority MRRFEU;

According to the information from MRRFEU, within this Thematic objective 4. "Support the turn to the economy based on low CO₂ emissions in all sectors," one of the investment priorities was 4.3. "Supporting energy efficiency and use of renewable energy in public infrastructure, including in public buildings and in the housing sector" The programming provided for financing the preparation and implementation of energy efficiency and energy renovation of residential buildings. The co-financing of measures for energy renovation of apartment buildings for the period prior to defining the Operational Plan will be implemented from the resources dedicated by the Fund for this purpose. From 2014 onwards, through adoption of the Operational Plan of the EU, citizens will use the funds from the EU funds.

4.4.2 Regional

Counties and municipalities in Croatia, after developing action plans for sustainable use of energy, also participate in co-funding measures of energy efficiency and RES implementation. For projects in households, certain amount of investment cost is co-financed, depending on each individual county or municipality. For larger projects, EPEEF

remained main financing option, along with EU funding through programmes for regional development and cohesion.

4.4.2.1 HR Energy Efficiency at Regional Level

EPEEF allocates significant funds for projects arising from measures defined by local governments in their sustainable use of energy in end-use action plans. The rest of the funds are allocated from the sources of local government units or through EU programmes of co-financing. Regional energy agencies had large impact on dissemination of knowledge and information about EE and implemented projects of EE and RES co-financing in households. EPEEF took over the implementation of these projects in 2015 in order to enhance availability of projects in whole Croatia.

4.4.2.2 HR Urban regeneration at Regional Level

Urban regeneration remains limited to projects for single building (mostly public use, schools, hospitals...) that are owned by the County. EPEEF secures co-financing of regeneration of private apartment buildings, in cases where tenant interest is sufficient to implement the project. Co-financing includes energy certification, documentation costs, works and measurement technology that need to be installed.

4.4.3 Local

Cities, after developing Sustainable Energy Action Plans, denote certain funds for measures implementation following the SEAPs.

Many cities have also voluntarily taken up different energy efficiency related activities through numerous projects funded by different government levels (the national ministries, the Environmental Protection and Energy Efficiency Fund) or external funds and organizations (UNDP, EU-funded projects etc.).

4.4.3.1 HR Energy Efficiency at Local Level

For RES eligible producer, in order to enter the tariff system, it is necessary to sign a contract with HROTE.

A main precondition for contracting with HROTE is connection of the plant to the grid of the regarding system operator.

In case a developer's aim to build the RES power plant on the building that was legal built, the developer obtains the status of eligible producer and the right to purchase electricity at an incentive price through simplified procedures with terms of grid connection.

For all other plants (other solar power plants, RES and HE-CHP technologies) a developer should take the next steps of administrative procedures to obtain the status of eligible producer and the right to purchase electricity at an incentive price:

- Energy Approval for construction of a new plant (issued by the **Ministry of Economy**);

- Preliminary Grid Connection Contract or Grid Connection Contract (concluded with Croatian Distribution System Operator **HEP-Operator distribucijskog sustava d.o.o. or Croatian Transmission System Operator Ltd**);
- Preliminary Decision on status of eligible producer (issued by **Croatian Energy Regulatory Agency**, CERA);
- Decision on status of eligible producer (issued by **CERA** following the plant construction).

After obtaining a necessary **documentation** the eligible producer shall sign Electricity Purchase Contract with HROTE. The Contract takes immediate effect from the date of the commissioning.

4.4.3.2 HR Urban regeneration at Local Level

Procedure of reconstruction of the building can be divided into three main steps, and for each it is possible to get a grant subsidy. These are:

- the energy audit and certification of buildings,
- preparation of project documentation for the project of reconstruction
- the reconstruction works on the building.

Total funds that the Fund will allocate for the current tender is over 120 million HRK. The major part relates to the work on the energy reconstruction of apartment buildings, the maximum amount per building is HRK 1.4 million. To conclude contracts on energy reconstruction of the building is sufficient consent of a simple majority of the co-owners.

5 Evaluation of current integration of energy efficiency in urban regeneration plans

The following section provides an assessment of how each of the FosterREG countries is undertaking Energy Efficiency measures in urban regeneration actions.

Previous sections' conclusions in which legal, management and financial framework have been analysed are set below in the form of barriers and drivers to tackle, as well as tools and instruments which would help to overcome those barriers.

5.1 Europe

As a summary of previous analysis regarding the EU administration level, the conclusion is that Energy Efficiency issues are totally integrated in the urban development strategies as one of the sustainable fundamental pillars. Their close relation is visible in all urban development funds and programs.

5.1.1 Barriers

Energy funds have mostly focused on housing and building scale, not adequately tackling the district scale. Individual residents, Social housing organizations and ESCOs have been beneficiaries of these funds more than private Housing associations.

EU urban regeneration investment is mainly focused in economically and socially deprived communities in which Energy Efficiency measures proposals are far from being a priority.

Synergies between EU policies and funding sources should improve regarding urban regeneration actions.

5.1.2 Drivers

The EU Urban Agenda Consultation is a good driver to improve EU policy and initiatives coordination. Assessment of the responses is particularly important for the Commission to consider them as the focal point of the Agenda.

The Council of European Municipalities and Regions (CEMR) works on influencing European policy and legislation in all areas having an impact on municipalities and regions. They are promoting the concept of 'Governance in Partnership' as a driver to make sure that EU policies are successfully implemented on local level.

5.1.3 Tools and/ or instruments

The Smart cities and Communities Initiative was launched in 2011⁷⁰ by the European Commission to boost the development and use of smart urban technologies. It was initially focused in energy efficiency, with the objective to create the conditions to trigger the mass market take-up of energy efficiency technologies in urban environments, although the scope has been broadened more recently to include sustainable transportation and ICTs. The initiative supports cities to develop demonstration projects to transform their built

⁷⁰ Investing in the Development of Low Carbon Technologies (SET-Plan), COM(2009) 519 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0519:FIN:EN:PDF>

environments, energy networks and transport systems into those of the future, demonstrating transition concepts and strategies to a low carbon economy.

Integrated Territorial Investments (ITI) is a promising tool from the EU to achieve integration of Energy Efficiency measures into urban regeneration. ITIs will be implemented through actions on different scales of urban development from the territory to all size of cities and neighbourhoods.

5.2 Spain

5.2.1 Barriers

POLICIES/ LEGISLATION

- There is not a unified and global vision of regulations and policies regarding EE and urban regeneration. EE as one of the priorities of Europe 2020 involves not only environmental issues but also very relevant economic aspects. Spanish National policies are forced to take the necessary measures to comply with the objectives that have been laid down.
- National rehabilitation and urban regeneration policies, on the other hand, are regarded as a way to revitalize the construction sector and develop EE objectives. As it has been analysed all policies do not have a bottom-up approach.
- EE Legislation is mostly focused on buildings, not on urban scale actions.
- One of the barriers to carry out urban regeneration is the property system of the existing housing stock. Horizontal Property Law does not recognize the Home Owners' Association's legal personality. According to this law, rights and obligations are of individuals and not the group's as such, so the decision making is very complicated
- Urban regeneration actions are fostering energy efficiency which is not the main issue to be solved in degraded areas which are subject of the intervention programmes.
- There is no connection between the Basque land Act and the Rehabilitation decree, which should shelter urban regeneration actions. Basque Land Act should be modified to allow for these types of interventions.
- Self-consumption legislation's limitations do not facilitate EE measures' implementation.
- Market regulations of the energy service companies are not too transparent enough for users (contract models, energy saving certification, etc.). It is difficult for energy services companies to be introduced in the residential market to offer best deals on energy supply.

- National, regional or citywide policies have in some cases replaced local policies that were focused on deprived neighbourhoods and embedded both social development and urban regeneration.

MANAGEMENT:

- At Municipal level, the analysis of recently approved Urban General Plans shows a clear will of the municipalities to foster regeneration and rehabilitation actions. However this effort fails in practice. The lack of appropriate planning instruments, the complexity of the management of the processes, and the difficulty of articulating viable funding models in municipal budget constraints and cuts are the main reasons for not taking place in the reality. In that sense it is very difficult to create district heating in existing districts.
- Management of multiple owners is a barrier when trying to drive urban regeneration actions. It is very difficult to put hundreds of owners to agree. In the case of rented housing, opposing interests of tenants and owners is a barrier too.
- The socio-economic profile of people living in homes that require energy rehabilitation tends to be medium-low, with low incomes, not sensible to energy efficiency measures.
- Deprived areas where urban regeneration is needed cannot generally afford investments on energy efficiency measures. Therefore EE is not the right message.
- Moreover, within the current individualistic culture, Owners Associations are not well structured and as mentioned before, not considering Owners Associations a legal entity is also a legislative weakness. They should be considered as the decision making level below the municipal level and provided them with statutory rights to simplify the management of urban regeneration plans

FINANCIAL

- Financing is the main barrier for the implementation of rehabilitation and urban regeneration policies and plans. Before the 2008 crisis some pilot cases of great interest and relevance were tested in Spain based on a public funding model. The 100% public funding option is nowadays dismissed, since public indebtedness is not possible anymore.
- Boosting energy efficiency actions by financing urban regeneration of degraded areas is not effective because in Spain there are other priorities to be tackled, such as accessibility, employment, etc.
- Grant applications to finance rehabilitation or urban regeneration actions are too complicated if they are not managed by technicians or professional experts.

- Public subsidies are essential for performing energy efficiency rehabilitation. Need to seek new methods for funding rehabilitation projects.
- Not many private initiatives are involved in implementing energy rehabilitation. Private banking, ESCOS, investment funds, etc. should invest in these kind of actions.
- The grant-making model has mis-educated the citizens to think public financing has to pay for everything.
- The economic crisis has hit the economies of the recipients of EE and regeneration measures. It is necessary to differentiate between social profiles and their priority needs in order to carry out effective urban regeneration.
- Difficulty of obtaining funding from financial institutions.
- There is also little response to appropriate funding mechanisms regarding rehabilitation and urban regeneration. There are not specific tax incentives or grants to impulse it, like those seen in the past encouraging the purchase of dwellings. The middle class could afford this type of interventions but the price is too high at the moment.
- There is not an EE and sustainability awareness in the Spanish society because the level of comfort without consuming energy is quite good and therefore it is not a priority, while other issues such as accessibility are.

5.2.2 Drivers

The National Urban refurbishment, regeneration and renovation Act of 2013 is a good driver to foster urban regeneration actions. The National Government is committed to include Energy Efficient measures into rehabilitation and urban regeneration plans and the Act provides positive incentives to achieve it.

Action plans of the Housing Master Plan 2013-2016 Plan for rehabilitation of buildings and urban regeneration and the Energy Efficiency Strategy Plan of the Basque Country (3E2020) fostered by the Sub-Department of Industry and Energy, especially Line C.3. and C.4 at regional level are good drivers to raise awareness of energy efficiency need. They also provide proposals for reducing energy consumption and increasing the use of renewables in buildings and the home by offering grants and programs.

Social inclusion and participation in Urban planning decision making is one progressimplemented in the development of recent municipal General Urban Plans. The lessons learnt of how to manage the social participation in these processes will lead to more skilled procedures and will train the staff in dealing with urban regeneration actions.

5.2.3 Tools and/ or instruments

Awareness campaigns will have to be developed, explaining the final users, the citizens, of the importance of implementing Energy Efficiency measures. The targeted public or market is not that of the degraded areas but medium class areas which can afford to implement EE measures at urban scale by their own means.

Improvement and simplification of administrative procedures and urban planning instruments is needed regarding regeneration as well as implementation of EE measures.

There is a need for providing technicians with strategies, methods and tools to carry out decision making to manage urban regeneration processes, as well as training technicians with skills on how to deal with owner's participation in urban regeneration plans.

Good diagnosis of building stock and its urban environment is needed so municipalities can identify priority areas needed of urban regeneration and plan ahead how to tackle those needs in the short and long term.

Legislation will have to change regarding property rights and conservation rights in order to simplify the management of urban regeneration plans.

5.3 Netherlands

5.3.1 Barriers

The Netherlands has various national policies promoting EE and RES for private homeowners. On local level even many more financial instruments are available like subsidies and grants, resulting in at least 190 financial mechanism in the Netherlands (july 2015 energiesubsidiewijzer.nl). However in reality, many agree that not enough progress is being made, especially when it comes to scaling-up and replication of initiatives.

First of all, current policy related to private home owners is based upon (creating) awareness and enthusiasm among citizens and increasing their participation. Financial programmes and knowledge initiatives are therefore focused on removing barriers and persuade citizens to invest in the energy efficiency of their homes. However, investments in deep renovation for energy efficiency are considerably (40 to 60k.) and the payback periods are often not acceptable for private home owners. Next to that, Dutch residents owners have a relatively high mortgage debt. The financial crisis of 2008-2009 and the following recession has resulted that many homes are "under water" (mortgage is higher than the current value of the house itself) and/or people have less disposable income.

There is currently no legal obligation for private homeowners on energy efficiency: no law obligating homeowners to improve energy efficiency, nor a financial penalty of any kind (like a property tax or some kind of trade regime with a sufficiently high carbon price). Whether voluntary measures are enough to obtain the European and national energy and climate goals for 2020 and onwards remains to be seen.

But even citizens who are enthusiastic about EE and RES will also find hurdles on their way. For EE measures, there is a variety of policy instruments affecting homeowners. There are, as mentioned before, many financial mechanism which makes it needlessly complex for private homeowners to figure out which subsidies might apply to their situation. The same applies for management mechanism and information provision. There are for example various (public/private) management mechanism and platforms providing online information each with their own focus points and interests, about which they are not always transparent. Next to that, private companies and civil organization are online information providers as well. Overall this results in disorderly and confusing information

provision which is not always up to date as well. A certain amount of skill and perseverance is needed to navigate through this maze, creating the risk of information asymmetry between people who are willing and able (i.e. high educated and environmental awareness, enthusiastic enough to take the time to figure it out and capable of making a wise investment decision) and those who are not. This could strengthen an unfavorable imaging, that sustainable subsidies benefit those people who arguably need it the least and/or would have invested in EE measures anyway.

Energy efficiency measures for the build environment is a diffuse market in which many parties have an interest: homeowners (associations), energy companies, grid operators, banks, municipalities, construction companies. Matching demand and supply for energy efficiency measure is identified as something that should be actively facilitated and/or organized. (National) markets on which demand and supply parties can meet are undeveloped.

Moreover, due to the huge variation in the energetic quality of houses, already applied energy efficiency measures and energy consumption the demand is very diverse and requires tailoring. Most large construction companies that are making efforts in providing the supply, have a background in large scale projects and focusing on a more industrial approach and economies of scale regarding energy efficiency measures. Therefore supply and demand do not align. Next to that, large construction companies and home owners are not accustomed to each other and/or organized to work with each other.

Next to that, the investment costs of energy efficiency measures can be significant and may represent a significant part of the total house value. Especially for a lower market segment of houses that were built to last approximately 50 years instead of eternity, the long payback period of measures in combination with the lower house value may become a serious obstacle.

As mentioned before, the resident has a large influence on the actual energy use of a dwelling. This means that technical measures (and thus energy labels) often perform different in practice than expected beforehand. It may therefore be recommended to measure actual energy reduction instead of calculated energy reduction.

5.3.2 Drivers

For RES measures, the policy for private home owners is in comparison to EE measures much more coherent. There are two (national) financial mechanism applicable for private home owners: net metering and/or postcoderoos. This has helped to create a feasible business model for PV, which is one of several reasons why PV has become popular in the Netherlands among private home owners. However, net metering is only guaranteed for another five year from now which creates uncertainty for the payback period of PV panels that are installed from now and onwards. Yet this is an improvement over start/stop subsidy programmes that were so successful that the budget ran out in a short period of time and the programme needed to be canceled: this inconsistent policy proved detrimental to building a business case. Sustainable investments, long-term consistent policy and a serious commitment of the Dutch government are needed for EE and RES.

The few formal moments between to discuss energy efficiency with home owner has been regularly mentioned as barriers. However, recently public bodies and private companies have identified various new contact moments. Municipalities are investigating how

moments (providing permits, documents, birth registration etc.) which are related to energy (use) and renovation can be used to provide information about energy efficiency possibilities. The indicative energy labels help to get a discussion started during the sale/acquisition process, although the effects are not measurable yet. Perhaps the most logical moment to discuss would be when the homeowner applies for a mortgage. Some banks or municipalities offer lower interest rates if the new homeowner wants to renovate. Currently, an energy companies and Do It Yourself (DIY) store company joined their forces by setting up energy shops-shops within DIY stores. Other energy companies include EE and RES in their business as well as they see themselves no longer as energy supplier or producer but more as energy service company. They do no longer only sell energy but as well solar panels, smart appliances and energy efficiency measurement advice.

When it comes to urban regeneration, it was already stated that there are no large programmes currently ongoing. However, if the energy transition continues to grow from the bottom up, and if entire neighborhoods decide to improve the energy performance of their homes, this may lead to the energy transition being a new impulse for urban regeneration. The 500 local energy initiatives within the Netherlands not only fosters the energy transition but also provides social cohesion within neighborhoods.

5.3.3 Tools and/ or instruments

There are developments regarding matching supply and demand of energy efficiency measures and provide an bundled and comprehensive information package.

Facilitation by Municipality

Various municipalities facilitate the process of matching supply and demand and providing information. As described earlier the municipality of Utrecht organize meetings and organizing the supply side

Foundation

To match supply and demand foundations are set up that organizes and identifies the demand for energy efficiency measurements of private home owners and owner associations. Parties providing the demand are affiliated to this foundation and pay a fee to the foundation for the efforts the foundation makes to organize and identify the demand. Currently various of these foundation exist in the Netherlands. An example within Utrecht is (H)eerlijk Wonen as described in paragraph 3.3.3.1

Renovation stores

Currently, at least seven renovation stores exist within the Netherlands. These actual physical stores provide information and sell mostly turnkey, tailor made energy efficiency measurements packets and concepts. They combine and literally center the various expertise's related to energy efficiency measurements (installation, energy, construction and financial).

5.4 Croatia

5.4.1 Barriers

POLICIES/ LEGISLATION

- A rapid legislative development, in the process of legislative harmonization, creates problems for project developers to follow and comply with regulatory changes. The legislative framework should be stable to create a secure environment for investors.
- Problems with property rights and ownership issues with public buildings
- The implementation of energy efficiency measures in renovation of protected cultural heritage buildings is disabled by unwillingness of authorities in charge of cultural heritage to allow energy efficiency retrofitting measures. That presents the greatest legislative challenge in Croatian legislation regarding EE measures and retrofitting, since the conservation and restoration experts strongly oppose any procedures which do not correspond to the original procedures of the era when a respective building was constructed. Their inflexibility is supported by the special law on protection of cultural heritage buildings which does not allow any 'modern' methods in retrofitting, but only conservation and preservation of original building methods. This is often the case with urban center of towns in Croatia, Zagreb and Osijek alike.
- EE measures are defined for building and households reconstruction, not so much for urban regeneration

FINANCIAL AND MANAGEMENT:

- Lack of well-prepared projects
- Insufficient financial resources to implement the competition on ESCO model
- If it is too low energy consumption in the building, renovation on ESCO model is not profitable
- Underdevelopment of the market according to ESCO model of reconstruction
- City and regional (county) budget financial means are extremely poor due to long-lasting financial crisis in Croatia, and they are by far insufficient to cover all the necessary projects. These budgets cannot even cover the works which present legal obligations of cities and counties (to achieve a minimum of energy class B in all public buildings).The Environmental Protection and Energy Efficiency Fund co-finance the retrofitting of public buildings (40-80%, depending on the development status of the region/city), but it is often still too much for some cities, municipalities and counties. The education of experts for elaboration of such spatial plans is insufficient in Osijek region. Again, EU projects seem to be the only possible way to ensure financial means to enable further education of experts on elaboration of EE measures in urban regeneration plans
- Significant financial barrier is by far insufficient financial means, as well as extremely low awareness of the need for education and training of handymen and craftsmen, which is at the same time also a sociological barrier. Therefore there are often problems and deficiencies in the very execution of works during the implementation of retrofitting projects
- Insufficient number of energy service providers - Problem: energy service providers must ensure energy saving guarantees

SOCIOLOGICAL:

- Education - Lack of experience and expertise in preparation of EE projects on project developer's side also exist in some cases.
- Ignorance of the majority of citizens, their insufficient interest in, awareness and education on energy efficiency measures, their effects and results;
- Significant barrier is partial implementation of energy efficiency measures due to lack of sufficient financial means and to ignorance and insufficient education. The measures are much too often implemented conflicting the rules of the profession. Therefore, in many cases, only a partial and unsystematic retrofitting is carried out, often causing other types of problems e.g. one replaces the windows and doors with PVC ones without adapting the ventilation system, which then causes occurrence of moisture and development of fungi indoors.

5.4.2 Drivers

POLICIES/ LEGISLATION

- The Croatian legal framework is predominantly stimulating and it is harmonized with the EU directives. All the public buildings in Croatia have a legal obligation to conduct energy audits and obtain energy certificates since 2009. Their legal obligation is also to achieve a minimum of energy class B. New houses or buildings cannot obtain the building permit unless its main design contains energy efficiency measures ensuring a good energy class and minimum CO₂ emissions.
- A newly established national register with the legal obligation for all the stakeholders to enter the implemented EE measures and the energy costs after the retrofitting. That is organized to enable following the implementation of EE measures adopted in city or county SEAPs as well as in national action plans and programs. There is also the obligation of drafting annual reports on implemented EE measures.

FINANCIAL AND MANAGEMENT:

- Properties which are owned by the public sector and have a high consumption can restore the building without their own participation (ESCO)
- Significant financial support for all kinds of EE projects is offered through different programs of the national Environmental Protection and Energy Efficiency Fund, as well as through EFRD financing. The national Fund offers even co-financing of all EU energy efficiency projects

SOCIOLOGICAL:

- A significant number of implemented energy efficiency projects (City of Osijek implemented 9 such projects), the significant component of which was raising the level of citizen awareness. One of the first ones, and maybe the most significant as a key project giving momentum to all the following ones, serving at the same time as a basis and a starting point for these following EE projects, was an UNDP financed project *Implementation of EMIS in the City of Osijek*
- The state has recently launched the education program for cities, municipalities and counties on implementation of EE measures regulated by national laws (in a form of a set of workshops)

5.4.3 Tools and/ or instruments

- Simplification of administrative procedures – some steps forward have been made, but there is still potential for improvement
- Appropriate technical support of financial institutions - Financial institutions need technical support to understanding EE projects better
- The implementation of public procurement for ESCO services in the public sector
- Specific sophisticated software applications for elaboration of spatial plans and education of experts on their usage (GIS, using a highly detailed AUTOCAD) would be very useful in our case
- Dissemination of knowledge and information about urban regeneration and EE measures in apartment buildings, as well as available financial mechanisms – it is necessary to raise awareness between tenants and their representatives
- Trainings for local self-government units and building management companies on how to cooperate with regional energy agencies in order to introduce EE measures and urban regeneration on larger scale in more efficient ways

6 Evaluation of Multi-level coordination

The following section evaluates the coordination of all administration levels regarding FosterREG project scope and their relation to relevant stakeholders.

As has been shown in previous sections, EU Energy Efficiency strategies, policies, and Directives have a clear traceability into National plans and legislations and next administrative levels.

Urban development, on the other hand, does not have such a strong directed coordination with other administrative levels. Priorities and objectives are of very diverse nature in each country. As pointed in previous sections one of the main tasks of the EU Urban Agenda is identifying and prioritisation of urban themes, so that multi-level cooperation is included in the urban dimension in policy design.

The following sections analyse how EE and Urban regeneration is coordinated by public administration at national, regional and local level and their relationships (if any) with other stakeholders in each of the FosterREG participating countries.

6.1 Spain

It has been set out clearly throughout previous chapters of this document that there is a total disconnection between Energy and Urban competences; there is not a unified and global vision of regulations and policies regarding EE and urban regeneration.

As for multi-level coordination we can draw the same conclusions as in Europe: EE is quite coordinated between Europe, National and Regional administrations, while urban regeneration is still quite uncoordinated.

Local administration, that has the competence of developing urban planning in their cities and towns, lacks of planning and management instruments to apply EE measures at district scale and within urban regeneration actions.

National and regional strategies do not reach local level in the practice. Top-down policies do not reach final users, especially when political objectives and those of the technician do not agree. This is the case of the National Urban Rehabilitation, Regeneration and Renovation Act. Municipal urban plans are not adapted to this law because many of actions to be taken may not be politically popular for the local government.

Municipalities are the most visible and the closest level of government to the citizens and even if they are getting more visible in Europe for the moment the feeling is that they do not have much involvement on European strategies.

6.2 Netherlands

Regarding Energy Efficiency the national government does not facilitate or hardly facilitate the execution of the National Energy Agreement on local level. Some small scale initiatives like regional collaboration (U-thuis) are promoted and subsidized by the National Government.

Urban regeneration is scattered on national level without focus at this moment. The recently started initiative Agenda Stad provides the opportunity for multi-level coordination again on this topic. The impact of the new Dutch Environment & Planning Act 2018 on multi-level coordination is unclear at this moment.

The Municipality of Utrecht and the Province of Utrecht work together, action based, specific and targeted in cases. There is no shared vision or program designed.

Collaboration and participation with local partners (residents, businesses, knowledge and educational organizations etc.) is a focal point of the Municipality of Utrecht. Not only during the implementation of policies but as well in developing visions, ambitions and plans.

6.3 Croatia

Bottom-up cooperation is met in Croatian national and local level, regarding EE projects, through financing mechanisms implemented by EPEEF. Example of cooperation was shown best through EE and RES projects for households, at first managed by regional energy agencies, and since 2015 by the EPEEF. Similar cannot be observed for urban regeneration, although EPEEF also financed all steps of regeneration for private apartment and commercial buildings.

Top-down cooperation on legislative and management efforts can be observed through cooperation of national bodies and agencies and the clients of energy service (the owners / users of buildings - the ministries, government bodies, local and territorial (regional) self-governments). Local and regional governments cooperate with APN and in the Program, APN is authorized for implementation of the contract in the name of budgetary and extra-budgetary users. Providers of energy service - companies that are engaged in the provision of energy services through energy performance contracts, are, along with EPEEF, at the end of the top-down chain of cooperation, together with financing entities such as commercial banks.

Through EMIS project, national, regional and local levels are integrated better than before. EMIS project enables easier analysis and interpretation of energy and water usage data on local, regional or national level the one central place.

Good cooperation between the institutions:

- APN - Environmental Protection and Energy Efficiency Fund (the Fund is co-financing the program of reconstruction of buildings in the public sector to 40% of the estimated investment)
- MoCPEP - APN, APN is the executive body of the Ministry
- APN - Local authorities
- Usually there are certain problems in communication between different levels of stakeholders, but it is not the case in the experience of city of Osijek. The coordination between the national, regional and local stakeholders is very good and successful regarding the City of Osijek and Osijek-Baranja County. In the case of the City of Osijek and Osijek-Baranja County, it is a relationship of long-term quality cooperation. The City of Osijek has excellent relationships with 3 ministries which deal with energy efficiency – Ministry of Environment and Nature Protection, Ministry of Construction and Physical Planning, Ministry of Economics (deals with energy) – as

well as with the Environmental Protection and Energy Efficiency Fund, which is the main financing body regarding EE and RES.

Urban regeneration is included in all levels of cooperation, although not in an integrated way, but through separate plans of renovation for certain types of buildings, at the moment according to ownership and use. Examples of this are current three national energy program of renovation: commercial buildings, public buildings and residential buildings.

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