The role of research and analysis in supporting ESCO policies and market developments

Paolo Bertoldi

Why we need research on ESCOs and EnPC?

- ESCOs have been operating in Europe since the 80ties, but only in a few national markets;
- Since 1992 the EU has been promoting the ESCO markets in its regulation and directives.
- More recently, several policy initiatives have been launched in the EU, including the Energy Saving Directive (ESD) in 2006 and the Energy Efficiency Directive in 2012, 2018 and 2023, and finally the Energy Performance of Buildings Directive.
- However, national markets are not yet well developed in most of the EU countries. Why?

Which type of research? Part 1

- Research and analysis can help remove barriers, introduce policies and foster local market developments by:

- Identify country local barriers:
  - Regulatory;
  - Legal;
  - Financial;
  - Behaviour;

- Identify local enablers and drivers:
  - EU and national policies;
  - Potential sources of financing (EU, national, private, etc.);
  - public procurement rules;
  - PPPs and concessions;
  - one-stop shops and facilitators;
  - potential clients' awareness (for example city officials);
  - Existing M&V;

Which type of research? Part 2

Research and analysis can help remove barriers, introduce policies and foster local market developments by assessing:

- The potential type of clients (e.g. public, private, etc.)
- The type of projects and sectors (e.g. street lighting, building retrofits, industrial, etc.)
- The type of contracts (e.g. duration, size, guaranteed vs shared savings, M&V, etc.)
- The financing options available (loans, guarantees, forfeiting, ect.)

Which type of research? Part 3

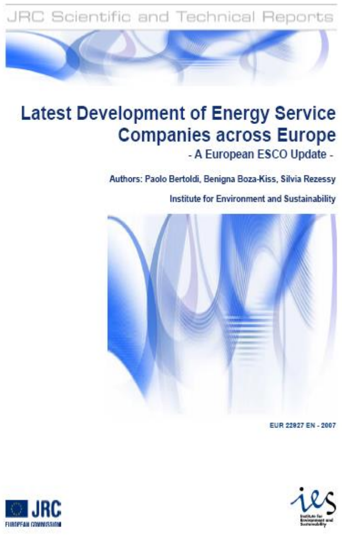
Research can:

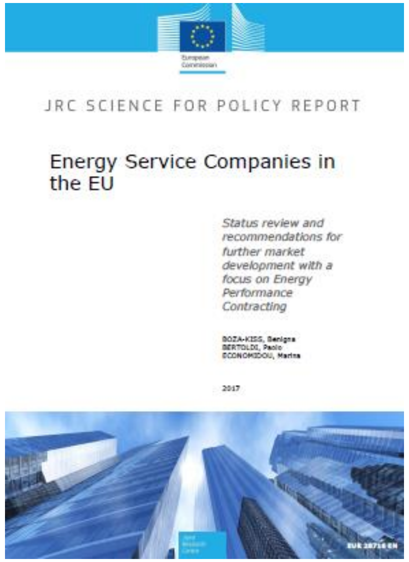
- suggest additional policies and measures, at the higher level on energy efficiency and decarbonisation policies or on specific issues such as public procurement,
- Show the benefits and advantages of the ESCO and EnPC model in implementing EE projects.
- Show the limitations: ESCO and EnPC cannot cover all sectors and types of EE solutions
- Studying the interactions with other EE and decarbonisation policy instruments (e.g. building codes, labels, incentives, white certificates, ETS, ESG, etc.)

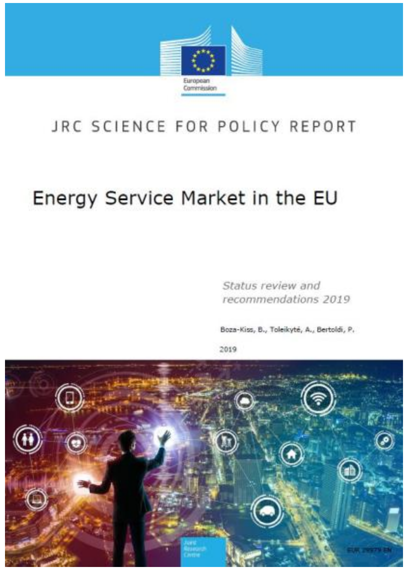
JRC Research on ESCOs

The European Commission Joint Research Centre (JRC) has carried out market studies since 2005 assessing the ESCO market size, the type, size and characteristics of projects and the barriers preventing ESCO to fully exploit the economic energy savings available.

Reports published in 2005, 2007, 2012, 2017, 2000 and 2022.







Overview of findings

- Continued relevance
- Growing trend (2017-21 and 2020-21).
- Growth expectations (2022-2024)
- EU policy drive – positive for EnPC and other service models
- Key role of the business environment
- “Less” barriers – need for national policy implementation

JRC 2023 Report

- The authors have identified four types of ESCO national developments.
- In the “successful” markets, a strong and typically large ESCO market, was present throughout most of the last 20 years. These markets include Germany, UK, Austria, France and to a lesser extend Italy and Spain.
- In the “adventurous” markets, the role and strength of the ESCO/EnPC market was fluctuating over time , depending on the changing policy environment, which affected the overall market development, and active role of the ESCO in these national markets (e.g. Slovenia, Denmark, Sweden, Slovakia, Hungary).
- The “small” markets, which have some characteristic ESCOs but has not been seen a significant roll-out (e.g. Bulgaria, Romania, Portugal, Ireland, Finland, Netherland , Latvia, Croatia).
- Finally, the “no-go” markets, which either have had a successful efficiency market or strategy without the contribution of ESCOs, or have intended to kick-start the markets, but not yet succeeded after repeated trials (such Greece , Luxembourg, Estonia, Lithuania, Cyprus, Malta).

Market size (raw and rated)

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

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

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

Trends

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

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

Barriers (2019-21 and 2022-24)

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

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

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

Drivers (2019-21 and 2022-24

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

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

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

Recommendations at EU and MS level

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

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

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

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

Thank you for your attention

paolo.bertoldi@ec.europa.eu