



Brussels, 30.11.2016
SWD(2016) 404 final

PART 4/4

COMMISSION STAFF WORKING DOCUMENT

Good practice in energy efficiency

Accompanying the document

**Proposal for a Directive of the European Parliament and of the Council
amending Directive 2012/27/EU on Energy Efficiency**

{COM(2016) 761 final}

Contents

Glossary and abbreviations	4
1. Energy efficiency policy works	5
1.1. Executive summary	5
1.2. Introduction.....	6
• Decoupling of energy consumption/GDP is achieved	6
• Decoupling: what happened and how it happened	7
• Energy efficiency opportunities: policies are working to a large extent and more could be done.....	11
2. Cross-cutting measures to support energy efficiency.....	13
2.1. Energy Efficiency obligations.....	13
• Policy context	13
• Project feedback on Energy Efficiency Obligations	14
• Key findings	18
2.2. Informing and empowering consumers through metering and billing.....	19
3. Energy efficiency in buildings	24
3.1. Renovations.....	27
• Long-term renovation plans and strategies	27
• Promising stories of deep renovations initiatives	28
3.2. Minimum energy performance requirements create a market and trigger innovation	31
• Introducing Nearly-Zero Energy Buildings (NZEB) into everyday life.....	35
• Checking and enforcing compliance with energy performance requirements.....	37
• Minimum energy performance requirements when selling or renting a property as strong market driver.....	37
3.3. Energy performance certificates- standardised information increases market visibility and transparency.....	38
• Best-practices improving the quality, transparency and/or reliability of EPCs and making EPC more user-friendly for different kinds of stakeholders.....	39
• Electronic databases for wider access and use of EPC data.....	44
3.4. Cross cutting issues	48
• Single energy performance calculation methodology for multiple users	48
• Making energy efficiency a win-win game (best practices in addressing split incentives) ...	49
• Tackling fuel/energy poverty e.g. in residential accommodation such as social housing	51
• Best practices on skills improvements of buildings professionals	53
• Smart homes& buildings – not a distant future (IT solutions for better buildings energy performance, multiple benefits for occupants and better integration of the building in the energy system)	57
4. Energy efficiency in industry, businesses, and services	61
4.1. Industry.....	61

•	Energy audits	61
•	Energy efficiency networks, benchmarking, and voluntary agreements	64
•	Support to sustainable energy use and waste heat recovery in processing industries	67
•	Contribution of environmental legislation to energy efficiency in the industry sector	71
4.2	Service sector	72
4.3	SMEs as a specific target group	75
4.4	Agriculture and rural areas	80
5.	Energy efficiency of products	84
6.	Setting the right public policy framework	88
6.1.	Energy efficiency targets drive the transition	88
6.2.	Coordinating energy efficiency efforts – multi-level governance	95
6.3.	Capitalising on energy efficiency multiple benefits	98
6.4.	Exemplary role of the public sector	101
7.	Energy efficiency investment market: On the move!	107
7.1.	Effective use of public funds to mobilise EE investments	108
7.1.1	Loan schemes co-financed by public funds	110
7.1.2	Risk-sharing instruments	115
7.1.3	Grant schemes	120
7.2.	Aggregation and assistance	122
7.2.1	Assistance to facilitate the use of Energy Performance Contracts	124
7.2.2	Key role of project development assistance for aggregation of small scale projects into investible packages	126
7.2.3	Innovative financing schemes for energy efficiency	129
7.2.4	Capacity building and stakeholder dialogue	134
7.3.	De-risking energy efficiency – creating the market	135
7.3.1	Standardisation of energy efficiency increases investors' confidence	136
7.3.2	Making energy efficiency attractive for institutional investors	137
7.3.4	Refinancing energy efficiency assets	139
Annex I:	National policies and measures identified as successful policies in the ODYSEE-MURE project	143
Annex II:	Overview of good practices per Member States as identified by the CA EED	146

Annex I: National policies and measures identified as successful policies in the ODYSEE-MURE project

Selected Member States

Code	Most successful energy efficiency measures in France	Avg Score	Measure Type 1)	Starting Year
HOU-FRA7	Sustainable Development Tax Credit	4.1	Fis/Tar	1995
HOU-FRA16	Local energy information centres (EIE)	4.0	Inf/Edu	2001
HOU-FRA31	Zero-rated eco-loan	3.5	Fin	2009
TER-FRA1	Audits subsidies in buildings	3.8	Fin	2000
TER-FRA8	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy performance diagnosis	3.2	Leg/Inf	2006
IND-FRA15	Loans for small and medium sized enterprises	3.6	Fin	2010
TRA-FRA22	Voluntary commitments to reduce CO ₂ emissions	3.9	Co-op	2008
TRA-FRA19	Automobile bonus malus	3.6	Fis	2007
GEN-FRA1	Energy Savings Certificates (ESC)	4.2	NMB	2006
GEN-FRA2	Information and advertising campaign: why wait?	3.6	Inf/Edu	2008
GEN-FRA18	Heat Fund	3.6	EE/CC/RES	2008

Code	Most successful energy efficiency measures in Germany	Avg Score	Measure Type 1)	Starting Year
HOU-GER33	KfW Programme "Energy-efficient refurbishment" (former CO ₂ Building Rehabilitation Programme)	3.9	Fin	2009
HOU-GER8	EU-related: Ecodesign Directive for Energy-using Products (Directive 2005/32/EC) - Energiebetriebene-Produkte-Gesetz - EBPG	3.7	Leg/Nor	2005
HOU-GER6	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Savings Ordinance (Energieeinsparverordnung - EnEV)	3.5	Leg/Inf, Leg/Nor	2002
TER-GER35	EU-related: Recast Ecodesign Directive for Energy-related Products (Directive 2009/125/EC) - Eco-Design of Energy-using products (Energiebetriebene-Produkte-Gesetz - EBPG)	3.8	Leg/Nor	2011
TER-GER29	Special fund for energy efficiency in SME's	3.6	Fin	2008
TER-GER32	Smart Metering	3.5	Leg/Inf	2010
IND-GER36	Special fund for energy efficiency in SME's	3.7	Fin	2008
IND-GER18	Voluntary agreement with German industry II	3.5	Co-op	2000
TRA-GER39	EU-related: Emission performance standards new passenger cars (Regulation 443/2009/EC) - Accelerating technical development / CO ₂ strategy for passenger cars	3.9	Leg/Nor	2009
TRA-GER32	Improving the infrastructure for using bicycles	3.8	Fin	2002
TRA-GER2	Heavy goods vehicle toll charges	3.3	Fin	2005
GEN-GER29	National Climate Initiative (NKI)	3.7	EE/CC/RES, NMB	2008
GEN-GER19	National Energy Efficiency Action Plan (NEEAP) of the Federal Republic of Germany	3.6	EE/CC/RES	2008

Code	Most successful energy efficiency measures in Greece	Avg Score	Measure Type 1)	Starting Year
HOU-GRE16	"Energy Savings in households" Program	4.3	Fin, Leg/Nor	2010
HOU-GRE15	Energy Performance of residential Buildings	4.0	Leg/Inf, Leg/Nor	2009
HOU-GRE20	Installation of electronic and intelligent metering of electricity and natural gas residential consumers	3.7	Co-op, Fin, Inf/Edu	2010
TER-GRE13	Energy upgrading of existing buildings through third-party financing arrangements (TPF), energy performance contracting and public and private joint ventures (PPJV)-Tertiary Sector	4.3	Co-op, Fin, Leg/Inf	2012
TER-GRE9	Energy savings in Local Self-Governments. - "Economize" program	4.1	Fin, Inf/Edu/Tr	2010
TER-GRE10	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Performance of Buildings of Tertiary sector	4.0	Leg/Nor	2010
IND-GRE6	Incentives for obligatory implementation of Energy Management Systems	3.6	Fin, Leg/Inf	2008
IND-GRE10	Promotion of Combined heat and power (CHP) and district heating systems- Industry Sector	3.5	Fin	2009
IND-GRE7	GRE7-Promotion of voluntary agreements in industrial sector	3.4	Inf/Edu/Tr, Leg/Inf, Leg/Nor	2010
TRA-GRE3	Improvements in Public Transport Networks	4.0	Infr	1998
TRA-GRE13	Taxation of new cars according CO ₂ emission	3.9	Fis	2010
TRA-GRE10	Incentives for replacement private vehicles	3.8	Fin	2008
GEN-GRE9	Program for Fin support of technological investments in energy efficiency	4.2	EE/CC/RES, Leg/Nor, NMB	2008
GEN-GRE10	Farther penetration of Natural Gas and LPG in Greek market	3.8	EE/CC/RES, Leg/Nor, NMB	2008
GEN-GRE11	Target campaigns for Tr, informing and awarding of best practice activities	3.7	EE/CC/RES, Leg/Nor	2008

Code	Most successful energy efficiency measures in Sweden	Avg Score	Measure Type 1)	Starting Year
HOU-SWE23	Technology procurement groups	4.3	Co-op	1989
HOU-SWE4	Energy and carbon dioxide tax in the household sector	3.9	Fis	1991
IND-SWE17	Energy efficiency networks for the industry	3.7	Co-op, Inf/Edu/Tr	2009
IND-SWE3	The Programme for Energy Efficiency in Industry	3.2	Co-op	2005
TRA-SWE24	Energy efficiency measures in transport Infrastructure	4.2	Infr	2011
TRA-SWE13	Value of fringe benefits for company cars	3.6	Fis	1997
TRA-SWE12	Vehicle taxation according to CO ₂ emissions	3.4	Fis	2006
GEN-SWE12	Energy and carbon dioxide taxes)	3.8	EE/CC/RES	1995
GEN-SWE8	Local Energy/Climate Counsellors	3.5	EE/CC/RES	1998

1) Co-op = co-operative measures, Leg/Nor = Legislative/Normative measures, Leg/Infor = Legislative/Informative measures, Fis/Tar = Fiscal/Tariffs, Fin = Financial measures, Fis/Tar = Fiscal/Tariff-based measures, Inf/Edu/Tr = Information/Education/Training measures, NMB = New Market-based instruments, Infra = Infrastructure measures, EE/CC/RES = General Energy Efficiency / Climate Change / Renewable Programmes,

Source : MURE database, September 2015 (the measure codes refer to the MURE database)

Overall scoring (most successful energy efficiency measures with the two highest average scores per EU Member State)

Country	Code	Measure Title	Avg. Score	Measure Type 1)	Starting Year
AU	GEN-AU2	"klima:aktiv" National programme for climate protection	4.2	EE/CC/RES	2005
AU	HOU-AU13	Residential building subsidy	3.8	Fin	1989
BEL	IND-BEL4	Flanders - Energy efficiency criteria in environmental permits	3.7	Leg/Inf	2004
BEL	HOU-BEL30	Wallonia - Financial incentives for RUE investments in buildings	3.5	Fin	2005
BG	HOU-BG19	Extension of the administrative, functional and financial capacity of Bulgarian Energy Efficiency and RES Fund with authorizing it for financing projects with renewable energy sources	3.8	Fin	2011
BG	TER-BG15	Financing of energy efficiency projects in municipal buildings by Operational Program Regional Development	3.8	Fin	2010
CR	TRA-CR18	Eco-driving training for drivers of road vehicles	4.3	Inf/Edu/Tr	2011
CR	HOU-CR9	Building regulations and enforcement	4.2	Leg/Nor	2006
CY	HOU-CY11	Net metering scheme was introduced for the promotion of small residential photovoltaic systems	3.9	Fin	2013
CY	IND-CY3	EU-related: Amended EU Emission Trading Scheme (Directive 2009/29/EC) - Governmental grants/subsidies scheme for the promotion of RES, energy saving technologies and the creation of a special fund for financing or subsidising	3.9	Fin, Inf/Edu/Tr	2003
CZ	HOU-CZ17	EU-related: Energy Labelling of Household Appliances (Directive 92/75/EC) - Energy labelling of household appliances – support of implementation	3.6	Leg/Nor	2004
CZ	HOU-CZ19	Green Savings Programme	3.4	Fin	2009
DK	GEN-DK6	The Energy Companies' saving effort	4.3	Co-op	2006
DK	GEN-DK10	Danish Energy Agreement 2012	4	EE/CC/RES	2012
FIN	IND-FIN14	Energy Efficiency Agreement of Industry 2008-2016	4.5	Co-op	2008
FIN	TER-FIN3	Energy Auditing Programme in the Service Sector	4.4	Fin, Inf/Edu/Tr	1994
FRA	GEN-FRA1	Energy Savings Certificates (ESC)	4.2	NMB	2006
FRA	HOU-FRA7	Sustainable Development Tax Credit	4.1	Fis/Tar	1995
GER	HOU-GER33	KfW Programme "Energy-efficient refurbishment" (former CO2 Building Rehabilitation Programme)	3.9	Fin	2009
GER	TRA-GER39	EU-related: Emission performance standards new passenger cars (Regulation 443/2009/EC) - Accelerating technical development / CO2 strategy for passenger cars	3.9	Leg/Nor	2009

Source: ODYSSEE-MURE (2015): Synthesis: Energy Efficiency Trends and Policies in the EU

Annex II: Overview of good practices per Member States as identified by the CA EED

Country	Title	Theme	Outcome
Austria	Measuring Impacts - Energy Counselling - Austria	Public Sector (CT2)	At the moment, the calculation method is used for reporting for the Energy Services Directive (ESD) only.
Austria	Consumer Information - Information campaign on energy management systems for SMEs - Austria	Consumer Information (CT6)	Guidebook, distribution of guidebook via Austrian Ministry of Economy, Family and Youth, the Austrian Energy Institute for Business, Austrian Chamber of Commerce and the Federation of Austrian Industries
Belgium	Article 4 building renovation strategy - Brussels Capital Region	NEEAPs (CT1)	n/a
Bulgaria	Energy Efficiency for Competitive Industry Financing Facility - Bulgaria	Financing (CT4)	Still the project is at an early phase of implementation and no results are available. It is expected that the programme will lead to high absorption rates of the SCF for energy efficiency in SMEs.
Croatia	Consumer Information - Energy efficiency information campaign - Croatia	Consumer Information (CT6)	<p>The interest in energy efficiency has significantly increased as well as implementation of EE measures by citizens. Public opinion surveys have revealed the following:</p> <ul style="list-style-type: none"> • number of citizens familiar with energy efficient products available on the market has increased from 33,4% to 43,9% • number of citizens using CFLs increased from 48% to 67,4% • number of citizens using A+ appliances increased from 22% to 30,8% • number of citizens using low-e windows increased from 14,8% to 23,4% <p>In addition, the number of requests for subsidies from the Fund has increased significantly since the start of the campaign.</p>
Croatia	IPMVP obligation for public energy performance contracts - Croatia	Energy Services (CT5)	<p>On-going</p> <p>It is expected that Measurement & Verification based on IPMVP in the public sector will enable better evaluation of expected and achieved savings and eventually increase the trust in energy services, which could become the solution for large-scale refurbishment of the public buildings in stock</p>
Czech Republic	Energy audits - Czech Republic	Energy Services	There are more than 350 energy auditors and more than 1 500 energy audits are prepared

Country	Title	Theme	Outcome
		(CT5)	annually.
Cyprus	n/a	n/a	n/a
Denmark	n/a	n/a	n/a
Estonia	n/a	n/a	n/a
Finland	EcoStart – Specialist Product Service for SMEs - Finland	Financing (CT4)	The impact assessment on the outcomes and benefits will be carried out in 2013.
Finland	Energy Services - Finland	Energy Services (CT5)	<p>The outcomes have been:</p> <ul style="list-style-type: none"> • ESCO seminars for ESCOs and potential clients (approximately every second year) • ESCO project register • ESCO guidelines and brochures • Articles about ESCO service • Information dissemination by phone etc. • ☑ Separate studies about ESCO service
Finland	Public Sector - Towards smarter green public procurement processes - Finland	Public Sector (CT2)	The key achievement will be the database, a sustainable public procurement excellence network and a smoothly running Help Desk.
Finland	Study of Cost Effectiveness of Individual Heat Meters and Heat Cost Allocators in Apartment Buildings - Finland	Metering and Billing (CT3)	<p>The most important outcome about the project was to get reliable facts and results about the cost effectiveness of heat meters or heat cost allocators in apartments in Finland.</p> <p>The topic i.e. heat metering in apartments, is not new in Finland but it has been under discussion and judgment for decades. The heat meters or cost allocators have faced mistrust and critics for many reasons (listed e.g. in the statement of Technical Board of Helsinki City 1.4.2008) though cost effectiveness have not been lately studied in deep details like in this study.</p> <p>Now the study, that was focusing clearly to the direct costs, shows the heat meters and cost allocators in apartments not to be cost effective in the Finnish circumstances (taking into account the state of energy efficiency, typical HVAC solutions in apartment buildings and</p>

Country	Title	Theme	Outcome																		
			<p>the climate in Finland). So the result of the study confirms the previous views and positions of the issue.</p> <p>The study will give a clear indication to the authorities when formulating the energy efficiency law for implementing EED.</p>																		
France	Writing the French 2014 NEEAP - France	NEEAPs (CT1)	<ul style="list-style-type: none"> The key achievement is the NEEAP itself, and the comprehensive overview it gives about our energy efficiency policies. The evaluations in the NEEAP (especially TD calculations using EC recommended methods) are also very helpful to identify sectors generating most energy savings, and sectors where more efforts are needed. The NEEAP is a very useful communication tool for us. After its publication in spring 2014, we will update a synthesis brochure, with the communication team of the ministry, like we did after our 2nd NEEAP. 																		
France	The use of ERDF funds in France for EE in social housing - France	Financing (CT4)	<p>At the national level, by the end of 2011:</p> <ul style="list-style-type: none"> 67 000 households with low incomes benefitting from energy savings (~2 200 dwellings refurbished per month) 15 000 local jobs created or maintained ERDF Average funding: EUR 2 886 per dwelling, representing 14% of the investment Global investment: EUR 1.1 billion Estimation of energy savings per year per households: <ul style="list-style-type: none"> - A 40% reduction in energy consumption - EUR 360-1000 saved per year <p>Energy consumption of dwellings before and after refurbishment:</p> <table border="1"> <caption>Energy consumption of dwellings before and after refurbishment</caption> <thead> <tr> <th>Level</th> <th>Before (%)</th> <th>After (%)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>0%</td> <td>15%</td> </tr> <tr> <td>B</td> <td>0%</td> <td>31%</td> </tr> <tr> <td>C</td> <td>4%</td> <td>52%</td> </tr> <tr> <td>D</td> <td>25%</td> <td>2%</td> </tr> <tr> <td>EFG</td> <td>71%</td> <td>0%</td> </tr> </tbody> </table>	Level	Before (%)	After (%)	A	0%	15%	B	0%	31%	C	4%	52%	D	25%	2%	EFG	71%	0%
Level	Before (%)	After (%)																			
A	0%	15%																			
B	0%	31%																			
C	4%	52%																			
D	25%	2%																			
EFG	71%	0%																			

Country	Title	Theme	Outcome
			(source USH) For the first call for proposals, projects have been completed recently: the follow up is going on.
France	Financing - Energy Performance Contracting for Public Buildings - France	Financing (CT4)	Main outcomes : <ul style="list-style-type: none"> • Connection of 69 buildings to a centralized management system ; • Installation of condensation boilers in 17 buildings ; • Connection of 2 buildings to a heat network • Installation of wood-fired boilers in 2 schools • Installation of 38sqm of solar thermal panel for hot water production at the central kitchen • Installation of heat pumps in 13 buildings • Replacement of all 284 doorframe of the Frédéric Mistral school Expected benefits : 17% reduction in primary energy consumption and EUR 177 000 savings for the city
France	Financing - Energy Performance Contracting for Schools- France	Financing (CT4)	Some results of the project: <ul style="list-style-type: none"> - the building of 6 biomass boiler rooms, - the installation of PV panels on 12 schools. - the connecting of one school to a low carbon heat network, - the improvement /optimization of lighting and heating management in all schools. The Koeberlé de Sélestat school benefited from a 4,3 M€ investment to build a wood-fired boiler room and isolate the
France	Financing - Technical Assistance - France	Financing (CT4)	Project is on-going The expected benefits of the project are delivery of important energy savings and emissions reductions for 1/6 of Paris' schools and creation of a new culture for energy efficiency for all the pupils, teachers and parents involved in these schools
Germany	Approach for the chapter on the market for energy services in the next NEEAP - Germany	NEEAPs (CT1)	Information basis for the assessment of the market for energy services and therefore also a basis for the detection of challenges and a further development of the market for energy services.

Country	Title	Theme	Outcome
Germany	Energy-Atlas Bavaria (Energie-Atlas Bayern) - Germany	Energy Services (CT5)	Project is on-going
Germany	Financing - KfW Energy Efficient Construction and Refurbishment - Germany	Financing (CT4)	<p>Positive Promotional Effects in 2012:</p> <ul style="list-style-type: none"> • 360 000 housing units reached with promotion • 370 000 jobs created or secured (estimation) • energy savings of 2 200 GW • CO₂ savings of 770 000 t/a • positive effect for public budget due to tax income and social security contributions: investment activities and job creation result in a high degree of self-financing of the promotional programs due to backflow of funds to the public budget
Greece	Saving Energy at Home - Greece	NEEAPs (CT1)	<ul style="list-style-type: none"> • Contribution to the country's energy security supply • Increase employment • 1700 employers • 500 engineers (4 000 engineers are involved as energy inspectors, consultants, sub-contractors, etc) • 300 bank employers • Until now: more than EUR 600 million have been distributed • Increase population awareness regarding energy saving issues • Reduce energy poverty, Improve thermal comfort and quality of life • The average energy consumption decrease is about 43% (164 kWh/m²) • Energy savings accounts approximately to 1.200 euro / year • Total annual energy saving is estimated at 712 GWh based on the 42 780 applications completed so far
Hungary	n/a	n/a	n/a
Ireland	The Green Plan - Ireland	NEEAPs (CT1)	<p>Kilbarrack Fire Station: Worlds first Carbon Neutral Fire Station</p> <ul style="list-style-type: none"> • 92% Water reduction • 97% Gas reduction • 80% Electrical reduction • 100% Organic waste reduction • 60% Domestic waste reduction

Country	Title	Theme	Outcome
			<ul style="list-style-type: none"> • 5 working Bee Hives and an allotment • Sick Building Syndrome eradicated • Better place to work – Fire Crews as Stakeholders • Link with Retired members restored <p>Dublin Fire Brigade</p> <ul style="list-style-type: none"> • 44% Energy reduction across estate • €11M tax payer money saved • €3.6M investment from ring fenced fund • Sustainability Report signed into Dublin Law • First Commemorative Garden for Deceased Members created
Ireland	Optimising Power at Work - Ireland	NEEAPs (CT1)	<ul style="list-style-type: none"> • Over 270 large Central Government buildings actively participating in the campaign. • Average annual energy savings of 20.4% currently being achieved (Sept 2015). • Approximate annual cost savings of EUR 4.9 million • Programme now being expanded into the wider public sector.

Country	Title	Theme	Outcome																																												
Ireland	Good Practice Energy Case Studies in Dublin City - Ireland		<table border="1"> <thead> <tr> <th>Organisation</th> <th>Projects</th> <th>Energy Reduction kWh CO₂</th> <th>Savings T/YR</th> </tr> </thead> <tbody> <tr> <td>PwC</td> <td>HVAC and BEMS upgrade</td> <td>35%</td> <td>35%</td> </tr> <tr> <td>Citi Bank</td> <td>Energy Management, CHP and DH – EPC</td> <td>4 GWh</td> <td>35%</td> </tr> <tr> <td>Charlotte Quay Apartments</td> <td>CHP and district heating</td> <td>120 000</td> <td>30</td> </tr> <tr> <td>Westcourt Management Services</td> <td>BEMS & Lighting Retrofit</td> <td>40 000</td> <td>20</td> </tr> <tr> <td>Royal Victoria Eye & Ear Hospital</td> <td>CHP and energy efficient upgrade – ESCO</td> <td>120 000</td> <td>71</td> </tr> <tr> <td>Dublin Port Company</td> <td>Boiler House Refurbishment & Ventilation Controls Retrofit</td> <td>N/A</td> <td>134</td> </tr> <tr> <td>An Post, Delivery Service Unity Cardiff Lane</td> <td>Lighting – High Bay</td> <td>442 250</td> <td>237</td> </tr> <tr> <td>The Mansion House</td> <td>Solar PV Thermal</td> <td>108 000</td> <td>28</td> </tr> <tr> <td>Brasserie 7</td> <td>Energy efficient lighting (LED), Building Management System upgrade, Energy bureau</td> <td>100 000</td> <td>50</td> </tr> <tr> <td>Dublin Bus</td> <td>Staff awareness and Energy Efficient Lighting</td> <td>110 000</td> <td>50</td> </tr> </tbody> </table>	Organisation	Projects	Energy Reduction kWh CO ₂	Savings T/YR	PwC	HVAC and BEMS upgrade	35%	35%	Citi Bank	Energy Management, CHP and DH – EPC	4 GWh	35%	Charlotte Quay Apartments	CHP and district heating	120 000	30	Westcourt Management Services	BEMS & Lighting Retrofit	40 000	20	Royal Victoria Eye & Ear Hospital	CHP and energy efficient upgrade – ESCO	120 000	71	Dublin Port Company	Boiler House Refurbishment & Ventilation Controls Retrofit	N/A	134	An Post, Delivery Service Unity Cardiff Lane	Lighting – High Bay	442 250	237	The Mansion House	Solar PV Thermal	108 000	28	Brasserie 7	Energy efficient lighting (LED), Building Management System upgrade, Energy bureau	100 000	50	Dublin Bus	Staff awareness and Energy Efficient Lighting	110 000	50
Organisation			Projects	Energy Reduction kWh CO ₂	Savings T/YR																																										
PwC			HVAC and BEMS upgrade	35%	35%																																										
Citi Bank			Energy Management, CHP and DH – EPC	4 GWh	35%																																										
Charlotte Quay Apartments			CHP and district heating	120 000	30																																										
Westcourt Management Services			BEMS & Lighting Retrofit	40 000	20																																										
Royal Victoria Eye & Ear Hospital			CHP and energy efficient upgrade – ESCO	120 000	71																																										
Dublin Port Company			Boiler House Refurbishment & Ventilation Controls Retrofit	N/A	134																																										
An Post, Delivery Service Unity Cardiff Lane			Lighting – High Bay	442 250	237																																										
The Mansion House			Solar PV Thermal	108 000	28																																										
Brasserie 7			Energy efficient lighting (LED), Building Management System upgrade, Energy bureau	100 000	50																																										
Dublin Bus	Staff awareness and Energy Efficient Lighting	110 000	50																																												

Country	Title	Theme	Outcome
Ireland	Energy Services - Small Medium Enterprise (SME) Business Programme - Ireland	Energy Services (CT5)	<p>On average, businesses make an 11% energy savings through this programme and the benefit is straight to the bottom line. To date businesses participating in the programme have shared savings in excess of EUR 50 million</p> <p>The key opportunities for energy savings among many participants are in the following areas. Many of these can be implemented at relatively low cost:</p> <ul style="list-style-type: none"> • Energy management practices – becoming more organised about understanding & monitoring energy performance and taking action to exploit opportunities for savings. • Lighting – switching off, changing to more efficient fittings, daylight & occupancy sensors, e.g. 16% electricity saving (EUR 4,700 saving per annum) in a school by replacing light fittings; • Refrigeration, heating, ventilation & air conditioning – designing, procuring, operating, maintaining & controlling these systems more efficiently, e.g. refrigeration can account for up to 65% of consumption in the retail sector. <p>Range of Savings</p> <p>Although the average annual energy saving attributable to participation in the programme is over 11%, the range of savings enjoyed by specific participants varies significantly:</p> <ul style="list-style-type: none"> • 82% of participants save at least 5%; • Over half make at least 10% savings; • Nearly a third saves more than 15%.
Italy	Renewable Technology for Improving Energy Efficiency in Greenhouses - Italy	NEEAPs (CT1)	n/a
Italy	TREND (Technology and Innovation for energy saving and efficiency in SMEs) - Italy	Energy Services (CT5)	<p>Almost 90 works for improving energy efficiency of SMEs.</p> <p>4 000 toe saved</p> <p>Successful promotion of a new professional skill (expert in energy management)</p>
Latvia	n/a	n/a	n/a
Lithuania	n/a	n/a	n/a

Country	Title	Theme	Outcome
Luxembourg	Smart Metering Project - Luxembourg	Metering and Billing (CT3)	n/a
Malta	n/a	n/a	n/a
Netherlands	Customer-friendly Individual Heat Metering - Netherlands	Metering and Billing (CT3)	n/a
Netherlands	Financing - Green Fund Scheme - Netherlands	Financing (CT4)	n/a
Netherlands	Friendly energy audit in the framework of Voluntary Agreement - Netherlands	Energy Services (CT5)	n/a
Poland	n/a	n/a	n/a
Portugal	Energy Audits - Portugal	Energy Services (CT5)	<ul style="list-style-type: none"> • By the end of February 2013, DGEG (Directorate General of Energy and Geology) had approved 649 PReN (Energy Consumption Realisation Plan) which became ARCEs (Realisation Agreement for Energy Consumption). • The implementation of these ARCEs will lead to a reduction of 80 769 toe in energy consumption and 291 903 t CO₂ of GHG. • Excise duties exemption (ISP) amounts to around 5,9 M Euro/year. • Facilities that are in compliance of SGCIE are equivalent to 1,389 Mtoe and represent 24% of final energy consumption in the sectors of Agriculture and Fisheries, Mining, Manufacturing and Construction and Public Works.
Portugal	Qualification System of Energy Services Companies - Portugal	Energy Services (CT5)	The Program aims to achieve a 30% improvement in energy efficiency in public services and bodies of Public Administration by 2020.
Romania	n/a	n/a	n/a
Slovakia	Measuring Impacts - Energy Saving Caluation from Highways - Slovakia	Public Sector (CT2)	We know how much energy is used in highways and that, even though energy savings are not the top priority for highway planning, there are some measurable savings which can be achieved.

Country	Title	Theme	Outcome
Slovenia	n/a	n/a	n/a
Spain	Article 4 renovation strategy - Spain	NEEAPs (CT1)	<ul style="list-style-type: none"> • Detailed and comprehensive overview of national building stock. Segmentation of the housing stock in building clusters according to building characteristics, which allows the definition of targeted renovation measures. Consideration of climatic zones. Clear identification of the different set of upgrading measures for the different building clusters (insulation, window replacement, heating/cooling system, etc.). • Ambitious concept of “deep renovation”: expected saving from 70-90%. • Clear description of current (2014) policies and programmes to support building renovation. Nearly parallel definition of policy measures (8/2013 Law, 2013 State Plan) and the process of drafting the Renovation Strategy. • Identification of bottlenecks and precise definition of required measures for the future, in order to achieve the Strategy Objectives. • Clear picture of the different scenarios for renovation, including total funding (private and public) required and the evaluation of impact in employment, CO₂ emissions, energy savings, etc.
Spain	Energy Services - Spain	Energy Services (CT5)	Project currently under development, so far no outcome yet.
Sweden	Consumer Information - Local energy advice - Sweden	Consumer Information (CT6)	<p>The municipal energy and climate advisors are increasingly known and used by the target groups. Citizens are more active in making contact with them than SME’s. The local advisors are, together with the regional agencies and supported with national training programmes, developing strategies and schemes to actively reach SME’s.</p> <p>Recently, a survey has been conducted, where individuals who were given energy advice via telephone during 2008 and 2009 were interviewed twice, one and two years respectively after the advice was given.</p> <p>The survey showed that 78% of the interviewees had taken action to save energy (behaviour change and investment). 39% of these had made a change of their heating system, among other actions.</p> <p>The single most important source of information for these people in influencing their decisions was the municipal energy and climate advisor (26%).</p>

Country	Title	Theme	Outcome
Sweden	Technology procurement for the building sector - Sweden	NEEAPs (CT1)	n/a
UK	Article 4 renovation strategy - UK	NEEAPs (CT1)	<p>Building regulations have achieved ongoing replacement of inefficient boilers that have contributed to a significant reduction in domestic energy use.</p> <p>All of the supplier obligation targets met and exceeded as part of phases 1,2 and 3 of the Energy Company Obligation</p> <p>Implementation of the Minimum Energy Efficiency Standard Regulations for the Private Rented Sector (April 2016)</p> <p>Provision of the Energy Saving Advice Service – a telephone advice line providing independent advice on energy efficiency refurbishment – receives on average more than 20 000 calls a month.</p> <p>Step by step energy efficiency scheme “Warmer Homes Scotland” launched covering advice to installation</p> <p>Funding for household energy efficiency targeted at the worst performing homes through the Nest scheme in Wales.</p>
UK	Energy Services - Green Deal - UK	Energy Services (CT5)	Project is on-going
UK	Financing - EU Structural Funds and Technical Assistance - UK	Financing (CT4)	Project is on-going
UK	Use of ERDF funds in England for energy efficiency in social housing and supply chain development - UK	Financing (CT4)	<p>Delivery of project outputs, including</p> <ul style="list-style-type: none"> • 410 business assists, • installation of 787 measures on social housing, • reduction of 1114 tonnes of CO₂, • creating or safeguarding 360 jobs and GBP 20m GVA.

Source: CA EED (2015) and country good practice factsheets. Available at: <http://www.ca-eed.eu/country-information>

