EU Member States Energy Efficiency Policies for the Industrial Sector with Focus on Market Base Instruments.

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2020 EE Targets for the EU-28



New target for 2030 set at 32.5%



Final energy consumption in the EU-28, by main sector





Industry





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Industry

2015

Solid fuels
 Total petroleum
 Gas
 Derived heat
 Renewable energies
 Electrical energy
 Waste (non-renewable)





2015

Iron and Steel Non-Ferrous Metals Chemical and Petrochemical Non-Metallic Minerals Food and Tobacco Textile and Leather Paper, Pulp and Print Transport Equipment Machinery Wood and Wood Products Other industries (Rubber, Plastics) Mining and Quarrying Construction



Decomposition of final energy consumption of the EU28 industry (JRC analysis based on Eurostat data)



Commission

The Energy Efficiency Directive

14.11.2012	EN Official Journal of the European Union	L 315/1						
	Ι							
(Legislative acts)								
DIRECTIVES								
DIRECTIVE 2012/27/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL								
	of 25 October 2012							
on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC								
(Text with EEA relevance)								
THE EUROPEAN PAI EUROPEAN UNION,	RLIAMENT AND THE COUNCIL OF THE Shifting to a more energy-efficient economy accelerate the spread of innovative to solutions and improve the competitiveness in the Union boosting economic growth a	should also echnological of industry and creating						

The EED Timeline - National Energy Efficiency Action Plans

γ.	2006	Energy Services Directive (ESD, 2006/32/EC)
	2007	1 st National Energy Efficiency Action Plans under ESD (NEEAP 2007)
	2011	2 nd National Energy Efficiency Action Plans under ESD (NEEAP 2011)
	2012	Energy Efficiency Directive (EED, 2012/27/EU)
	2014	1 st National Energy Efficiency Action Plans under EED (NEEAP 2014)
	2016	Energy saving target under ESD
.	2017	2 nd National Energy Efficiency Action Plans under EED (NEEAP 2017)
	2019	1 st Integrated Energy and Climate Plans under Energy Governance Regulation
	2020	Energy efficiency target under EED
•		Liter Euro

Energy Efficiency Measures in the EED



Policy Instruments

Regulatory	Building codes; Minimum energy performance standards (MEPS) for new and existing buildings; Energy efficiency standards for appliances & equipment; refurbishment obligations; Procurement regulations; Phase-out of inefficient equipment
Financial and fiscal	Grants/subsidies; Preferential loans; Tax incentives; Energy taxation
Information and awareness	General Information; Information campaigns; Information Centres; Energy Audits; Energy labelling schemes; Governing by Example; Information exchange; Aware- ness campaigns; Demonstration programmes;
Qualification, training and quality assurance	Professional training; Training courses; Vocational education, quality standards
Market-based	Incentives facilitating Third Party Financing / ESCOs; Energy Efficiency Obli- gation Schemes (EEOSs); White certificates ¹ ; Incentives for the producers of innovative technologies; Technology deployment schemes
Voluntary action	Voluntary certification and labelling programmes; Voluntary and negotiated agreements;
Infrastructure investments	Investments in transportation infrastructure (e.g. railways, road networks), energy infrastructure (e.g. generation plants, electrical grid, substations, and local distribution); Smart meter roll-out;
Other	Other measures that do not fall under one of the above categories

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Industry measures

- Measures in the industry sector are based on existing policies (taxation, financial incentives, voluntary agreements, audits, information and training, Energy Efficiency Obligations)
- All MS have put into effect the mandatory requirement for EAs for non-SMEs (Article 8)
- <u>Voluntary agreements</u> common policy instrument for the industry sector. 10 Member States have established agreements with industry actors:
 <u>BE (FL), DK, HR, FI, IE, LU, NL, PT, SE, UK</u>

EE Policies in Industry (Voluntary)

- DK Since 1996 EE agreements with large energyintensive companies – Grants in exchange for a 3-year agreement on EnMS
- NL Since 1992 Long Term Agreement EE Plans, Annual Energy Consumption Monitoring, EnMS
- **IE** >3000 SMEs in Voluntary Agreements
- **FI** programme combined with audits since 1997
- **SE** Programme for promoting EE in Energy Intensive organizations (since 2004 till 2013)
- **HR** Industrial EE Network
- CZ, SK Voluntary Agreements to be started



Financial Incentives

- **FI** EAs Programme 1.7 M EUR per year (Finished after EED)
- **SK** Energy Audits in Bratislava region
- HR Grant scheme for EE in manufacturing industry and development of RES in industry
- PT SGCIE promotes EE in intensive energy consuming (>500toe): Energy audits and Energy Rationalization plan
- BE (FL) Grants through the Ecology Grant Plus programme
- **IE** Accelerated Capital Allowance grants for efficient equipment
- LV Grant Scheme for renovation of Industrial Buildings
- **FR** Subsidized loans for EE investments



Introduction to Market Based Instruments

- **Market-based instruments** (MBIs) are public policies which make use of market mechanisms (some with transferable property rights) to distribute the burden of a public policy.
- In the **energy sector MBIs** have been used to promote RES-E and to pollutants emissions (e.g. CO_2 , SO_2 , No_x quotas coupled with permit/allowance trading). EU ETS is operating successfully since 2005 in industry and power generation.
- Theoretically MBIs **minimize cost for society** for reaching a certain target (static efficiency) and create incentives to innovate and improve performance (dynamic efficiency).



Energy Companies Obligations: creating compliance markets

- A possible market-based policy portfolio (compliance market) oriented towards end-use energy efficiency could comprise
- **Energy-savings quota** (obligation) for some category of operators (distributors, <u>suppliers</u>, consumers, etc.). The **quota** is achieved by energy **savings** associated to energy efficiency **projects**.
- Projects savings verified **by an independent authority** (e.g. the regulator).
- At the end of the period the **subject under obligation** must have **savings** related to projects to show compliance.
- In <u>some scheme</u> the saving are **certified by means of the so**called "white" certificates (certificates for energy savings).
- In some scheme the savings or the certificates or the quota could be traded.



Definitions

- Energy Efficiency Obligations: schemes where an energy saving target is imposed on energy suppliers (retailers) or distributors, very seldom on generators (in the US also know as EERS).
- White certificates: the energy savings are certified.
- **Tradable white certificates**: in this case there is trading (among obliged subject or among obliged and *eligible subjects*).



Justification/rationale for implementing suppliers obligations or white certificates schemes

In countries where suppliers obligations or white certificates are already in place it is found that justification/rationale for implementing energy companies obligations or white certificates schemes (as an alternative to other energy efficiency policy instruments) typically is:

- Higher cost-effectiveness in the achievement of given saving targets;
- Creation of incentives to privately finance energy efficiency (ESCOs, etc.);
- Saving of public money (if compared with classical subsidies for energy efficiency);
- Avoidance of energy price distortion between sectors (if compared with energy taxes);
- Avoidance of the very high transaction costs typically caused by the introduction of energy performance standards;
- Higher consistency with liberalized energy markets;



Key features

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The key elements of suppliers' obligations and white certificates schemes:

- 1. The <u>creation and framing</u> of the demand (government set the overall target and the rules for its apportioning to obliged actors). Targets are expressed in absolute values (then apportioned according to different rules) or as percentage of energy sales.
- 2. Institutional *infrastructure* and processes (such as measurement and verification, checking compliance, etc.) to support the scheme.
- 3. A system of *sanctions* in the case of non compliance
- 4. The *cost recovery* mechanism, in some cases (optional).
- 5. The <u>tradable instrument</u> (certificate) and the rules for issuing and trading (optional).

Major design choices

- The results delivered (compliance, dominant projects and sectors) are determined the nature of the projects
 - Size of the obligation;
 - Choice of primary or final energy or CO2;
 - > Obliged and eligible actors;
 - Sectors covered;
 - Eligible measures and lifetimes of measures and additionality;
 - Measurement & Verification of savings (M&V);
 - Cost-recovery mechanisms;
 - Interactions with other policy tools;
 - Trading rules;
 - Sanctions;



Obligated parties

- Suppliers (retail companies) UK and FR
 - Strong links to the final consumer and may have the motivation to offer value-added services;
 - Uniquely placed to provide information about consumption through billing and metering processes and to inform consumers about measures on offer.
- Distributors (DNOs) IT, DK and Flanders
 - More stable regulated organisations, which are natural regional monopolies and will not go out of business (as may happen with suppliers);
 - With proper tariff regulation, they do not have the strong push to sell 'more kWh', as is in the case of suppliers;
 - However they are disconnected from the end-user and thus may lack motivation to do end-use energy efficiency.



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Italian WhC Scheme



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Italian WhC Scheme





Italian WhC Scheme



WhC In Italy,

- Around 48 million WhC issued and 26 Mtoe delivered by 2017;
- **ESCOs** have been the main actor in presenting projects both in terms of proposals (96%) and of toe (70%, whereas 25% come from end-user companies and 5% from DSOs);
- ≈60% of those savings have been metered and ≈57% have been linked to monitoring plan projects;
- Capability to promote industrial energy efficiency projects linked to manufacturing process improvements;
- Success in dealing with a growing proposals trend (11,709 CRs presented in 2016 and 815 MPPs VS ≈150 in 2007 and ≈550 in 2012).
- Over 12 years of working time (it's the longer-life scheme for energy efficiency available in Italy).



Energy Efficiency Obligations in the EU



EED Article 8 main requirements

- The Obligation: Mandatory Energy Audits
- The Obligated Parties: Non-SMEs
- **Quality** Requirements: Audits, Auditors
- Compliance Paths: Voluntary Agreements, EMS/EnMS
- Relationship with EN and ISO standards (ISO 50001)
- **Supervision** requirements: Member States
- Public Support Possibilities
- Other requirements: SME



Before the EED



Commission

Energy Audits realized on non-SMEs



Structure of Capital for EE Investments

E	ebt Fi	nancing	5							
On-balance-sl	neet	Off-b	alaı	nce-sheet		Inter	nal sources	Externa	l sources	
Bank loan	ESCC)	Leasing		Cash	In-kind contribution	Investor	Revenue		
Secur	ity beh	ind the	10	an					EU funding	
Collateral	Guar	antees]	Insurance					Carbon finance	



Definitions

ENERGY SERVICES (ES)

The physical benefit, utility or good derived from a combination of energy with energy efficient technology and/or with action, which may include the operations, maintenance and control necessary to deliver the service, which is delivered on the basis of a contract and in normal circumstances has proven to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings (Directives 2006/32/EC, 2012/27/EU)

ENERGY SERVICE COMPANY (ESCO)

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. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other acreed

ENERGY PERFORMANCE CONTRACTING (EPC)

A contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings (Directive 2012/27/EU)

ENERGY SERVICE PROVIDER

A natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a final customer's facility



Typical ESCOs activities





Benefits of EPC

From the Beneficiary (public administrator or client) point of view an EPC project offers the following opportunities:	From the Contractor (EPC provider) point of view:
 involvement of private funds for a public project, which is excellent especially if the public body is limited in budget; can be a cheaper solution (but not always!) than in-house project management; transfer of technical and often financial risk; receiving complex renovation package (if wanted); no need for sophisticated in-house expertise; project management overtaken, thus ability to focus on core activities; possibility to get involved in more projects (liquidity issues resolved). 	 long term projects possible (usually); reliable partner, including payment (usually); large projects, often pooled; dissipation effect (among public sector bodies and to the private building owners); baseline available (usually).

Off-balance sheet financing

- Operational leasing
- ESCO Energy Service Company and EPC
- Forfeiting
- Public Private Partnership
 - **BOOT** Build, Own, Operate and Transfer of infrastructure projects, promoted and financed by the private sector, whereby the promoter builds, owns and operates the project and only after a specified number of years does it transfers it the ownership back to the public sector.
 - **Concession** An understanding between a company and the host government that specifies the rules under which the company can provide service locally.



Conclusions

- The EED offers a good framework that complements other directives (Eco-design, Energy Labelling, EPBD)
- Helps MS adopt targets and structure their EE policies to meet the targets
- EED has been a driver for new measures in the MS. But still the majority are old measures.
- NEEAPs are the backbone of the EE EU policies



Conclusions

- Most Industry measures are existing prior to EED (e.g. Voluntary schemes)
- EEOs have been in use since 2000 in some MSs including projects in the industrial sector. WhC in Italy are very effective in supporting EE projects in industry. Now more MSs are adopting this policy instrument
- Mandatory EAs and EnMS are the main Industry measure in the EU. Industry does not outsource EM
- Financing (Grants, loans, and accelerated depreciations) also a very popular measure, while ESCOs are not very active in industry, unless strong incentive (as in Italy).
- Energy consumption has been decreasing, but...

•37There is not silver bullet policy, but a range of policies in needdomission

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