Improving Energy Efficiency in SE Europe

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Greenhouse Gas Emissions worldwide



https://www.esrl.noaa.gov/gmd/ccgg/trends/full.html

12/2015 Paris Climate Agreement: EU leading the way



Source: UNFCCC/WRI

Basic Policy of EU to tackle Climate Change for 2050



European Energy Policy, towards to 2050

- 20% reduction GHG emissions wrt 1990
- 20% of RES in energy consumption
- 20% reduction in primary energy consumption compared to a baseline projection;

And has implemented a comprehensive legislative package including mandatory obligations by M-S in RES, EE, ETS and non-ETS, a s well as eco-design standards for appliances and CO₂ emissions by vehicles.

2030 (Clean Energy for all Europeans)

- 32% of RES in gross final energy consumption
- 32,5% reduction in primary energy consumption compared to a baseline projection (EED recast 2018/2002/EC)
- 45-46% reduction in GHG emissions

The EU also started implementation of a Market Stability Reserve for the ETS, which has already pushed target significantly upwards in 2018.

2050 – Mid Century Strategy policy proposal by the EC, (2019)

- 80-95% reduction in GHG emissions wrt 1990 in the EU as a whole
- For the transport sector, at least, reduction 60%

Energy Prices in SE Europe: Electricity





Household electricity price in 2017

Retail electricity prices for industrial consumers in 2017

Energy Prices in SE Europe: Natural Gas



Household gas price in 2017



Median and large industrial gas price in 2017

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=COM:2019:1:FIN&from=EN

Energy Efficiency (EE) in SE Europe

- All EU M-S in this area are working to fulfil the requirements of EU Directives promoting EE (EPBD recast, EED recast, RES recast, etc.,
- All other countries are making progress in the area of EE; i.e. by transposing the Directives and preparing their NEEAPs
- Important factors for the promotion of EE are:
 - 1. EU accession process provides the needed political stimulus,
 - 2. The importance of the EU-established Energy Community and its Secretariat
 - 3. Establishment of an EE policy framework, based on the commitment of governments and politicians to promote EE
 - Assistance financial & technical by donors (EBRD, GIZ, SIDA, etc) to EE projects.

Energy Efficiency Policy Context (IENE SE Europe Energy Outlook 2017/17

		EU framework Directives on energy efficiency (Very slow progress)				
Countries	Long-term Policy Objective for Energy Efficiency	LegalFramework	Energy Services Directive	Energy Labelling Directive	Energy Performance of Buildings Directive	
Albania	In 2009, the National Energy Efficiency Action Plan (NEEAP) 2010 – 2018 was adopted with an energy savings target of 9% of the average energy consumption between 2004 and 2008 by 2018.	The existing energy efficiency law is Law No. 9379, date 28.04.2005. A draft law on buildings was submitted to the Ministry in December 2014.	Not. implemented	Partly	Not implemented	
Bosnia & Herzegovina	Kosovo's NEEAP (2010–2018) foresees an achievement of the indicative target of 9% to 1021.08 ktoe until the end of the period.	The basic laws regarding energy efficiency and administrative guidelines derived from these laws are drafted : the Law on Energy: Law on Energy Efficiency: Administrative Instruction for the Promotion of Efficient Use of Energy from end users and Energy Services; Administrative guidelines for the labelling of devices that use energy; Administrative Instruction for Energy Audit; Administrative Instruction on rules for Energy balances; Regulation on the establishment and functioning of the commission for certification of energy auditors and managers.	Partly	Imple- mented	Partly	
Acedonia The Energy Efficiency Strategy stipulates a target of 9% energy savings in the final energy consumption until 2018 compared to the average energy consumption in the country in the period 2002–2006.		FYROM used to be a frontrunner not only in transposing the acquis but also in effectively tackling energy reforms. Over the last few years, the pace of reforms has slowed down.	Partly	Imple- mented	Imple- mented	
Montenegro	The long-term objective is to meet the 9% target required under Energy End-Use Efficiency and Energy Services Directive.	The Ministry of Economy drafted a new Law on Efficient Use of Energy. which was adopted by Parliament of Montenegro on 16 December 2014. According information from website of Ministry of Economy, the new law on efficient use of energy is in compliance with main EU Directives in the field of energy efficiency	imple- mented	Partly	Partly	
Serbia The long-term objective is under Energy End-Use Efficiency and Energy Services Directive		In March 2013, the Law on Efficient Use of Energy was adopted in Serbia.	Imple- mented	Imple- mented	Partly	

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www.iene.eu

EED (2012/27/EC-2018/2002) and its obligations

4.966.142 toe

636.580 toe

368.330 toe

The case of Greece

Greece transposed the EED in 2015 with the L.4342/2015 An obligation for large companies (> 250 employees and annual turnover > 50 mil €) to perform – every 4 years – energy audits by specialized energy auditors, who will propose energy efficient measures full analyzed, in both technical and financial manner.



Until May 2018, from the carried-our energy audits and their results it can be seen that:

- 1. Metal producers
- 2. Refineries
- 3. Whole trade

The proposed measures for Energy Efficiency can save up to 45.113.000 toe!





Energy Poverty and Energy Efficiency

It is widely acknowledged in the literature that there are three main components at the basis of energy poverty:

- low household income;
- high/growing energy prices;
- inefficient energy performance of buildings concerning thermal insulation, heating systems and equipment.

Cold homes and energy poverty have been identified as major contributors to health and social inequality that could be alleviated through energy efficiency measures.

In fact, the reduction of the number of persons at risk of poverty or social exclusion in the EU via energy reconstructions in buildings is one of the key targets of the Europe 2030 strategy.





E	N:	Energ	zy Pov	verty	in EU



European Energy Network

Table 1 - EPOV primary indicators values for selected European countries:

Country	2M (2010)	HEP (2010)	Keep warm (2016)	Arrears (2016
Austria	15.3	12.5	2.7	4.2
Belgium	14.7	10.5	4.8	5.0
Bulgaria	14.7	15.9	39.2	31.7
Croatia	10.9	9.6	9.3	25.3
Cyprus	11.9	13.2	24.3	15.4
Czech Republic	10.7	8.4	3.8	3.0
Denmark	17.7	12.0	2.7	2.5
Estonia	16.2	16.5	2.7	7.9
Finland	14.8	22.3	1.7	7.7
France	18.1	23.7	5.0	6.1
FYR Macedonia	8		25.7	41.0
Germany	16.6	15.1	3.7	3.0
Greece	14.2	10.3	29.1	42.2
Hungary	6.9	5.0	9.2	16.2
Iceland			1.6	6.0
Ireland	18.4	12.3	5.8	12.1
Italy	-	16.3	16.1	8.9
Latvia	14.5	13.2	10.6	13.2
Lithuania	21.4	21.2	29.3	9.7
Luxembourg		8.5	1.7	4.0
Malta	17.3	15.6	6.8	9.0
Netherlands			2.6	2.0
Norway			0.9	2.4
Poland	18.1	18.5	7.1	9.5
Portugal	15.7	8.8	22.5	7.3
Romania	18.6	17.5	13.8	18.0
Serbia			13.3	34.8
Slovakia	10.0	9.2	5.1	5.7
Slovenia	14.1	11.5	4.8	15.9
Spain	15.2	13.0	10.1	7.8
Sweden	17.7	31.0	2.6	2.6
Switzerland			0.6	4.5
Turkey			15.9	33.2
United Kingdom	17.8	9.8	6.1	5.7

Source: ENGAGER Policy Brief

Energy Poverty and Energy Efficiency: A Greek study*

Research on energy poverty and health impacts of affordable warmth initiatives have primarily to date been conducted using quantitative and statistical methods, limiting the way how energy poverty is understood.

- A study took is a longitudinal approach that focused on Hellenic households during economic crisis. It and records the energy efficiency measures that were adopted during 2012–15 in order to overcome cold.
- The evidence of the research, is based on a comprehensive study of 491 questionnaires from low-income households mainly from North Greece. The findings show that around **37% of the sample** face the energy poverty
- problem and **around 50%** could not afford to upgrade energy efficiency at their households, in order to addresses the problem as its roots.
- In general, the results show that improving the energy efficiency of homes at risk of energy poverty has a profound impact on wellbeing and quality of life.

^{*} International Journal of Sustainable Energy: Vol. 38, 2018 issue 1 Monitoring energy poverty in N. Greece: The energy poverty phenomenon

Energy Poverty and Energy Efficiency: SMARTEES Project



HORIZON 2020 – Project «*SMARTEES: Social Innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability*» is a transdisciplinary research project which aims to support the energy transition and improve policy design by developing alternative and robust policy pathways that foster citizen inclusion and take local peculiarities into account.

Timişoara has developed an action plan to reduce its fossil energy use and decrease carbon intensity. At the same time, as energy costs are a challenge for a significant proportion of the city's inhabitants, it combines energy transitions with measures addressing fuel poverty. In the field of energy-efficient buildings and districts, Timişoara municipality has identified three major goals:

(1) renovation work to transform existing buildings into energy-efficient buildings,

(2) energy-efficient districts, and

(3) neutral or energy-positive new buildings.

Through thermal rehabilitation, the city aims to reduce the beneficiaries' costs by increasing the energy performance of buildings while reducing the annual heating costs by approximately 60%. The municipality also supports citizens' initiatives. Owners of apartments and buildings in the residential sector, private businesses, and large industrial customers are other important actors who influence energy consumption in Timişoara.

http://local-social-innovation.eu/energy-efficiency-against-fuel-poverty/

Energy Efficiency and Innovation

Innovation in product design and in production process can save energy, by developing:

- Products which are allowing the final user to consume less energy, maintaining the same level of service,
- Products that require less energy to be produced, disposed, maintained and finally to be recycled.

Such innovations can be:

- Small: i.e improvements in product's design and in manufacturing, often in collaboration with the suppliers and the customers
- Large: i.e. by developing new technologies, mainly from universities, research centers, often in collaboration with the manufacturers.

Direct sectors of Innovation

- Products consuming fuel or energy (motors, heating boilers/burners, HVAC systems, lighting equipment, vehicles, etc.)
- Construction Control systems
- Materials Nanotechnology (insulation materials, paints, Cold materials, ceramics, graphene, batteries)
- Measurements Data collection & processing immediate results (mega data)
- IT Real time interactive applications
- Information management of the public; awareness raising, participation

Indirect sectors of Innovation

- Robotics (drones, energy resources detection, disaster prevention)
- Data visualization systems (head-up display)
- Human-Machine interaction systems HMI
- Organic materials (organic photovoltaics)
- Bacterial technology (artificial photosynthesis)
- Geomechanical and interconnected Satellite Systems (autonomous vehicles, natural resources management)

Key Messages

1. Energy Efficiency in SE Europe is not being given enough priority or attention although its role has been recognized in all EU Member States, which have enacted appropriate legislation, and by Energy Community contracting parties. 2. Although Energy Efficiency plays a critical role in limiting world energy demand growth to one third by 2040, while the global economy grows by 150% (IEA, World Energy Outlook 2015, p. 26), in SE Europe efforts to introduce Energy Efficiency as an

integral part of national energy planning are in their infancy.

3. Some countries such as Greece, Bulgaria, Romania and Cyprus, in addition to enacting appropriate legislation have introduced a range of financial incentives for the improvement of energy performance of buildings with EU funding already in place.

4. So, a lot more work will be required at state and local authority level for Energy Efficiency schemes to become acceptable at domestic ground route level.

Thank you for your attention!