Improving Energy Efficiency in SE Europe

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Greenhouse Gas Emissions worldwide

Up-to-date weekly average CO$_2$ at Mauna Loa

https://www.esrl.noaa.gov/gmd/ccgg/trends/full.html
12/2015  Paris Climate Agreement: EU leading the way

LONG-TERM GOAL
for net zero carbon this century

ENHANCED TRANSPARENCY
and accountability

STRENGTHEN CLIMATE ACTIONS
every 5 years

ADAPTATION
to help most vulnerable

FINANCIAL SUPPORT
especially for least developed countries

187 COUNTRIES
announced climate plans

Source: UNFCCC/WRI
Basic Policy of EU to tackle Climate Change for 2050

- Promotion of RES
- Development of Common Internal Market for Electricity & Gas
- Promotion of Energy Efficiency in the Use of Primary Energy
- Decarbonization
- Application of ETS

Basic Policy EU: Climate Change Targets 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, as 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

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
  4. Assistance – financial & technical – by donors (EBRD, GIZ, SIDA, etc) to EE projects.
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<tr>
<td>Albania</td>
<td>The existing energy efficiency law is Law No. 5775, dated 18.04.2006. A draft law on buildings was submitted to the Ministry in December 2014.</td>
<td>Not implemented</td>
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<td>N. Macedonia</td>
<td>The Energy Efficiency Standard stipulates a target of 10% energy savings in the final energy consumption until 2018 compared to the average energy consumption in the country in the period 2003-2005.</td>
<td>Partly implemented</td>
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<td>Montenegro</td>
<td>The Ministry of Economy issued a new law on the Efficient Use of Energy, which was adopted by the Parliament of Montenegro on 14 December 2014. According to information from the website of Ministry of Economy, the new law on the efficient use of energy is in compliance with the EU Directives in the field of energy efficiency.</td>
<td>Partly implemented</td>
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<td>Serbia</td>
<td>The long-term objective is to meet the 10% target required under Energy Efficiency and Energy Services Directive.</td>
<td>Implemented</td>
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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-out energy audits and their results it can be seen that:
1. Metal producers 4.966.142 toe
2. Refineries 636.580 toe
3. Whole trade 368.330 toe
The proposed measures for Energy Efficiency can save up to 45.113.000 toe!

Data from PLANT magazine – March 2019 pp 24-29
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.
## EEN: Energy Poverty in EU

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

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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.

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!