Energy Efficiency in the European Union: General Trends and the Role of Buildings

National Conference on Energy Efficiency in Buildings

Helsinki, 5 November 2014

Claudia Canevari
Deputy Head of Unit

Unit C3, Energy Efficiency Directorate General for Energy
2020 (EED)

"By June 2014, the Commission shall assess progress achieved and whether the Union is likely to achieve energy consumption of no more than 1474 Mtoe […] in 2020".

"The Commission shall submit the assessment […] to the EP and the Council, accompanied, if necessary, by proposals for further measures".

2030 Communication

The mid-2014 review shall also: "[…] establish the exact ambition of future energy savings policy and the measures necessary to deliver it […]"

"[…] consider whether energy intensity improvements of the economy and economic sectors, or absolute energy savings or a hybrid of the two represents a better benchmark upon which to frame a 2030 objective."
ENERGY EFFICIENCY TOWARDS 2020
Trends

Energy efficiency of the EU economy is steadily increasing. Economic growth is being decoupled from energy consumption.
Energy efficiency progress: across all sectors

- Between 1995 and 2010 the average consumption of new cars in the EU decreased by 27%.

- New dwellings built today consume on average 40% less than dwellings built 20 years ago.

- The share of refrigerators meeting the highest energy efficiency labelling classes (A and above) increased from less than 5% in 1995 to more than 90% 15 years later.

- EU industry improved its energy intensity by almost 19% between 2001 and 2011, compared with 9% in the US.
There is progress in setting the right legislative framework

- NEEAPs point to a strengthening of current Member States policies and the setting in place of new ones.

- The number of Member States applying energy efficiency obligation schemes for utilities is expected to rise from five to sixteen.

- Financing mechanisms under the European Structural and Investment Funds are being diversified, with greater use of financial instruments.
At the same time in several cases the transposition and enforcement of relevant rules is delayed:

- Only six Member States have so far notified full transposition of the EED.

- At the moment, there are nine Member States that still have not completed the transposition process of the EPBD (deadline July 2012).

- Only a handful of Member States are conducting a proper market surveillance of products covered by efficiency requirements.
Based on an analysis of Member State actions and additional forecasts, the Commission estimates that the EU will achieve energy savings of around 18-19% in 2020.

In order to bridge the gap to the target efforts should be concentrated on the following elements:

1. **Strengthening** local and regional verification of **national building codes** and accurately informing consumers of the energy performance of buildings for sale or rent;

2. Fully implicating **utilities** in working with their customers to obtain energy savings;

3. Strengthening **market surveillance** of the energy efficiency of products;

4. Make full use of available financing, in particular ESIF.
EU Legislation on Energy Efficiency in Buildings
Overview of existing legislation

- **ED & ELD**
  - Directives 2009/125/EC 2010/30/EU
  - Energy performance of building products

- **New buildings**
  - Energy performance certification of buildings (EPCs)

- **Existing buildings**
  - Major renovation
  - Building elements
    - Envelope and technical systems

- **Cost-optimum energy performance requirements**

- **Recast EPBD**
  - Directive 2010/31/EU

- **EED**
  - Directive 2012/27/EU
  - Nearly-zero energy

- **National plans**

- **Issue, handover, quality control**
  - Display in public buildings

- **3% renovation for central government**
  - Long term renovation roadmaps

- **Energy performance of building products**

- **Nearly-zero energy**
Setting cost-optimal requirements

- Aimed at ensuring high ambition level in Member States.
- Reports from Member States due by March 2013.
- Current state: 27 reports received so far.
- Commission is checking and will report next year.
Reliable energy performance certification schemes

Effect of one-letter or equivalent improvement in EPC rating across a selection of European property markets (see also notes in the main report)
Nearly-zero energy buildings

- After 31 December 2020 all new buildings occupied are nearly zero energy buildings (31 December 2018 for public buildings).
- Updated progress report is available on DG ENER's website.
2030
THE PROPOSED POLICY AMBITION AND DIRECTION
2030 target

• 30% savings by 2030 (vs. 2007 reference) ensures broadly that the current level of energy efficiency policy ambition is continued (reducing consumption at a little over 17 Mtoe per year).

• While leading – on the same assumptions as the "2030" modelling – to higher energy system costs than savings below 30%, it results in significant benefits in terms of:

1. Security of supply;
2. Macro-economic (GDP, employment);
3. Health and environment.
Impact Assessment – Methodology

Framework conditions

- PRIMES 2013 Reference.
- GHG 40%; split ETS/non-ETS maintained.
- RES 27%.

Policy options (scenarios analysed)

- Stepwise increase of EE policy ambition: 27%, 28%, 29%, 30%, 35% and 40% savings in 2030 (vs 2007 PRIMES).
- No changes in policy mix (based on current); just intensity.

Impacts assessed

- Energy system and security of supply.
- Economic impacts (system costs, investment expenditure, energy prices, GDP, employment).
- Competitiveness and affordability.
- Environmental impacts (CO₂, pollutants, health).
Energy system and security of supply impacts

- Fuel mix – Share of solids and nuclear fairly stable; oil declines with higher ambition; reductions in gas consumption are most pronounced.
- Security of supply – Every additional 1% in energy savings leads to a further reduction of about 2.6% in gas imports.

<table>
<thead>
<tr>
<th>Indicator (2030/2050)</th>
<th>Ref</th>
<th>GHG40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Energy Imports Volume (2010=100)</td>
<td>96 / 101</td>
<td>89 / 56</td>
</tr>
<tr>
<td>- Solid</td>
<td>77 / 49</td>
<td>68 / 42</td>
</tr>
<tr>
<td>- Oil</td>
<td>93 / 96</td>
<td>90 / 41</td>
</tr>
<tr>
<td>- Gas</td>
<td>105 / 122</td>
<td>91 / 74</td>
</tr>
<tr>
<td>- Renewable Energy</td>
<td>492 / 601</td>
<td>505 / 1043</td>
</tr>
<tr>
<td>Fossil Fuels Import Bill Savings</td>
<td>n.a</td>
<td>-190 / -3404</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decarbonisation Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE27</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>86 / 59</td>
</tr>
<tr>
<td>61 / 40</td>
</tr>
<tr>
<td>86 / 44</td>
</tr>
<tr>
<td>88 / 82</td>
</tr>
<tr>
<td>509 / 1002</td>
</tr>
</tbody>
</table>
Energy system costs and investments

• Energy system costs - average annual costs (expressed as % of GDP) for the period 2011-2030 across all scenarios range between 0.01 and 0.79 percentage points of GDP higher compared to the Reference with a shift from energy purchases to direct efficiency investments and capital costs.

• Investments (av. annual 2011-2030) range between €851 bn and €1147 bn whereas in the Reference scenario they amount to €816 bn.

• Highest investment increase in the building sector.

• Capital investment leads to increased amenity value that could correspond to some 40% of the cost of investments in energy efficiency in the residential sector (according to a separate study).
Economic impacts (I)

• Electricity price changes compared to Reference are very small in 2030 ranging from +0.85% to +3.34% in the year 2030.

• ETS prices vary significantly (in the long term to a lesser extent).

• International fuel prices decrease up to about 8% in the case of gas and up to about 3% in the case of oil (to be further analysed).
Economic impacts (II)

- **GDP** decreases from -0.07% to -1.2% in 2030 if crowding-out is assumed (GEM-E3); increases from 0.49 to 4.45% if spare capacity in the economy is assumed (E3ME).

- **Employment** both models used show increases in employment from 0.5% to 2.96% (GEM-E3) and from 0.23% to 1.5% (E3ME) in 2030. Shift of labour from such sectors as Power and Oil to Construction, Metals and Transport Equipment.
Proposed 2030 target

• **EU target**: flexibility for Member States.

• The target should continue to be based on **absolute primary energy** consumption.

• COM will also look at **additional indicators** (e.g. energy intensity). Progress will be reviewed in 2017.

• The **governance system** proposed by the 2030 Climate and Energy Framework Communication will provide the framework for evaluating the effectiveness of national and EU energy efficiency policies.
Main challenges

Putting in place the right policy framework

- Effective implementation of current framework.
- Revision in the short and mid-term of certain elements of the framework (e.g. Energy Labelling; Article 7 and other elements under the EED).

Mobilising investments

- Effective use of European Structural and Investment Funds and other funding (EIC, H2020, etc.).
- Work with the financial sector to create the right framework conditions for investment (e.g. development of the right standards).
- Stimulate demand (through a robust implementation of existing and future rules, e.g. on EPCs).
European Council conclusions

- Indicative target of at least 27%.

- Review by 2020 having in mind an EU level of 30%.

- The Commission will propose priority sectors in which significant energy-efficiency gains can be reaped, and ways to address them at EU level.
Comparison on investment and energy purchases to the 2030 IA GHG 40 scenario in average annual values for 2011-2030 in bn €’10

Investment Expenditures, avg annual 2011-30 (bn €)
Energy Purchases, avg annual 2011-30 (bn €)
Next steps: 2030 Framework

<table>
<thead>
<tr>
<th>Review of the products framework</th>
<th>Early 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of certain other elements of the legislative framework</td>
<td>2015-2016</td>
</tr>
<tr>
<td>Work on implementation</td>
<td>Continuous</td>
</tr>
<tr>
<td>Work on financing (ESIF, EIB financial sector)</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Thank you for your attention

For further information on energy efficiency please consult our website:

http://ec.europa.eu/energy/efficiency/

claudia.canevari@ec.europa.eu