

Energy Efficient technologies for Buildings – New and Retrofits, 6th Workshop

Building Energy Declarations in Europe

By

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- **On 23 January 2008 the European Commission put forth an integrated proposal for Climate Action.**
- **This includes a directive that sets an overall binding target for the European Union of 20% renewable energy by 2020 and a 10% minimum target for the market share of bio-fuels by 2020, to be observed by all Member States.**




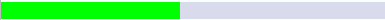



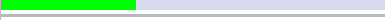




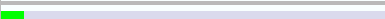
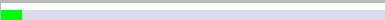
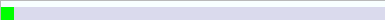
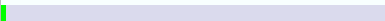

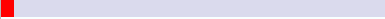

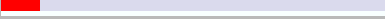
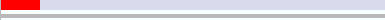

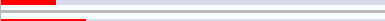


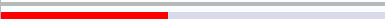



- **European Union**

- **Towards a low carbon future**
- **European Commission proposes a plan to accelerate energy technologies for a low-carbon future**
- Technology is vital in reaching the **reduction of greenhouse gas emissions by 20% and ensure 20% of renewable energy** sources in the EU energy mix and to **reduce EU primary energy use by 20% by 2020.**
- The transition to a low carbon economy will take decades and touch every sector of the economy. Decisions taken over the next 10-15 years will have profound consequences for energy security, for climate change, for growth and jobs in Europe.































CO₂ EMISSIONS

Are the European member states meeting their Kyoto 2012 carbon dioxide(CO₂) emission targets?
 Countries in the *green* do well and emit less than their 2012 target. The countries in the *red* emit more than their Kyoto target.
 Figures are in Megaton (Mt CO₂-eq).

| EU MEMBER STATE | 2003 | 2004 | 2005 | 2006 | 2007 | KYOTO TARGET 2012 | % UNDER KYOTO TARGET |
|-----------------|---------|-------|--------|-------|-------|----------------------|-------------------------------------------------------------------------------------------------|
| LATVIA | 10,7 | 10,7 | 10,9 | 11,7 | 12,1 | 23,3 |  48,07 % |
| ESTONIA | 21,2 | 21,2 | 20,7 | 19,2 | 22,0 | 40 |  45,00 % |
| LITHUANIA | 16,7 | 21,1 | 22,6 | 22,8 | 24,7 | 44,1 |  43,99 % |
| ROMANIA | NO DATA | 160,1 | 153,7 | 153,9 | 152,3 | 259,9 |  41,40 % |
| BULGARIA | NO DATA | 68,9 | 69,8 | 71,5 | 75,7 | 127,3 |  40,53 % |
| HUNGARY | 83,3 | 79,5 | 80,5 | 78,8 | 75,9 | 114,9 |  33,94 % |
| SLOVAKIA | 51,1 | 49,5 | 48,7 | 49,0 | 47,0 | 67,2 |  30,06 % |
| POLAND | 382,5 | 396,7 | 399 | 399,3 | 398,9 | 551,7 |  27,70 % |
| CZECH REPUBLIC | 147,5 | 147,1 | 145,6 | 149,1 | 150,8 | 180,6 |  16,50 % |
| SWEDEN | 70,9 | 69,7 | 67 | 66,9 | 65,4 | 75,2 |  13,03 % |
| UNITED KINGDOM | 658 | 660,4 | 657,4 | 647,9 | 636,7 | 678,3 |  6,13 % |
| FRANCE | 560,9 | 556,1 | 553,4 | 541,7 | 531,1 | 564 |  5,83 % |
| GREECE | 137,2 | 137,6 | 139,2 | 128,1 | 131,9 | 139,6 |  5,52 % |
| BELGIUM | 147,6 | 147,6 | 143,8 | 136,6 | 131,3 | 135,9 |  3,38 % |
| GERMANY | 1024,4 | 1025 | 1001,5 | 980,0 | 956,1 | 972,9 |  1,73 % |
| | | | | | | | % OVER KYOTO TARGET |
| NETHERLANDS | 215,4 | 218,4 | 212,1 | 208,5 | 207,5 | 200,4 |  -3,54 % |
| PORTUGAL | 83,7 | 84,6 | 85,5 | 84,7 | 81,8 | 77,4 |  -5,68 % |
| IRELAND | 68,4 | 68,6 | 69,9 | 69,7 | 69,2 | 63 |  -9,84 % |
| FINLAND | 85,4 | 81,2 | 69,3 | 79,9 | 78,3 | 71,1 |  -10,13 % |
| SLOVENIA | 19,7 | 19,9 | 20,3 | 20,5 | 20,7 | 18,6 |  -11,29 % |
| ITALY | 577,3 | 580,5 | 582,2 | 563,0 | 552,8 | 485,7 |  -13,82 % |
| DENMARK | 73,6 | 68,2 | 63,9 | 71,0 | 66,6 | 54,8 |  -21,53 % |
| AUSTRIA | 92,5 | 91,2 | 93,3 | 91,6 | 88,0 | 68,7 |  -28,09 % |
| SPAIN | 407,4 | 425,2 | 440,6 | 433,0 | 442,3 | 331,6 |  -33,38 % |
| LUXEMBOURG | 11,3 | 12,8 | 12,7 | 13,3 | 12,9 | 9,1 |  -41,76 % |
| MALTA | 3,1 | 3,2 | 3,4 | 2,9 | 3,0 | NO TARGET |  NO TARGET |
| CYPRUS | 9,2 | 9,9 | 9,9 | 9,9 | 10,1 | NO TARGET |  NO TARGET |

Renewables in Europe

| EU Member State | 2006 Figure | 2020 Target | % To cover: | |
|-------------------|--------------|-------------|---------------|---------------------------------------------------------------------------------------|
| 1 United Kingdom | 1,5 % | 15 % | 13,5 % |  |
| 2 Ireland | 2,9 % | 16 % | 13,1 % |  |
| 3 Denmark | 17,2 % | 30 % | 12,8 % |  |
| 4 France | 10,5 % | 23 % | 12,5 % |  |
| 5 Netherlands | 2,7 % | 14 % | 11,3 % |  |
| 6 Spain | 8,7 % | 20 % | 11,3 % |  |
| 7 Greece | 7,1 % | 18 % | 10,9 % |  |
| EU | 9,2 % | 20 % | 10,8 % |  |
| 8 Italy | 6,3 % | 17 % | 10,7 % |  |
| 9 Latvia | 31,4 % | 42 % | 10,6 % |  |
| 10 Belgium | 2,6 % | 13 % | 10,4 % |  |
| 11 Cyprus | 2,7 % | 13 % | 10,3 % |  |
| 12 Germany | 7,8 % | 18 % | 10,2 % |  |
| 13 Luxembourg | 1 % | 11 % | 10 % |  |
| 14 Malta | 0 % | 10 % | 10 % |  |
| 15 Portugal | 21,5 % | 31 % | 9,5 % |  |
| 16 Slovenia | 15,5 % | 25 % | 9,5 % |  |
| 17 Finland | 28,9 % | 38 % | 9,1 % |  |
| 18 Austria | 25,1 % | 34 % | 8,9 % |  |
| 19 Lithuania | 14,6 % | 23 % | 8,4 % |  |
| 20 Estonia | 16,6 % | 25 % | 8,4 % |  |
| 21 Hungary | 5,1 % | 13 % | 7,9 % |  |
| 22 Sweden | 41,3 % | 49 % | 7,7 % |  |
| 23 Poland | 7,5 % | 15 % | 7,5 % |  |
| 24 Slovakia | 6,8 % | 14 % | 7,2 % |  |
| 25 Bulgaria | 8,9 % | 16 % | 7,1 % |  |
| 26 Romania | 17 % | 24 % | 7 % |  |
| 27 Czech republic | 6,5 % | 13 % | 6,5 % |  |

US \$ per gallon of heating oil

Including taxes & duties

| Country | Cost |
|----------------|------|
| | |
| France | 3.3 |
| Germany | 3.1 |
| Greece | 3.1 |
| Hungary | 5.6 |
| Italy | 5.8 |
| Luxembourg | 2.6 |
| Sweden | 5.2 |
| United Kingdom | 2.9 |
| Spain | 3.2 |

US cents per kWh, domestic, electricity 7,500 kWh/year. Incl. taxes and duties

| Country | Cost |
|-----------------------|-------------|
| | |
| France | 18.8 |
| Germany | 30.3 |
| Greece | 11.4 |
| Hungary | 20.6 |
| Italy | 36.5 |
| Luxembourg | 26.3 |
| Sweden | 26.8 |
| United Kingdom | 19.7 |
| Spain | 19.1 |

US cents per kWh, domestic, natural gas 15,000 kWh/year. Incl. taxes and duties

| Country | Cost |
|-----------------------|-------------|
| | |
| France | 9.7 |
| Germany | 12.1 |
| Greece | 4.1 |
| Hungary | 6.0 |
| Italy | 10.4 |
| Luxembourg | 8.9 |
| Sweden | 17.2 |
| United Kingdom | 6.0 |
| Spain | 8.9 |

US cents per kWh, industrial, electricity 2,000 MWh/year. Incl. taxes and duties

| Country | Cost |
|-----------------------|-------------|
| | |
| France | 10.9 |
| Germany | 19.8 |
| Greece | 12.3 |
| Hungary | 18.1 |
| Italy | 24.4 |
| Luxembourg | 16.4 |
| Sweden | 9.8 |
| United Kingdom | 17.8 |
| Spain | 12.6 |

US cents per kWh, industrial, gas 115 MWh/year. Incl. taxes and duties

| Country | Cost |
|-----------------------|-------------|
| | |
| France | 4.5 |
| Germany | 5.8 |
| Greece | 2.9 |
| Hungary | 4.1 |
| Italy | 4.9 |
| Luxembourg | 3.7 |
| Sweden | 5.5 |
| United Kingdom | 5.6 |
| Spain | 4.2 |

Energy Declaration of Buildings

Directive 2002/91/EC

of the European Parliament and of
the Council

of december 2002

on the Energy Performance of Buildings

Background

European goals to reduce primary energy use and CO₂ emissions

Buildings use 40 % of total energy in Europe

10 Million boilers are older than 20 years

Air conditioning is increasing rapidly, mostly in the south of Europe

What, When, How often ?

ALL Buildings that are constructed, sold or rented out: Energy Performance Certificate must be produced. Validity of certificate not to exceed 10 years

New buildings with floor area over 1,000 m²:

*Must meet European Minimum Energy Performance requirements (tailored to local climate)

*Alternative systems such as:

- Decentralised energy supply systems based on renewable energy
- CHP
- District or block heating or cooling
- Heat pumps under certain conditions

must be considered and taken into account before construction starts

What, When, How often ?

Major renovation projects, (over 25 % of the value of the building), over 1,000 m²:

Energy performance shall be upgraded to "meet minimum requirements in so far as technically, functionally and economically feasible"

Public buildings over 1,000 m²:

*Energy Performance Certificate shall be publicly posted.

*Recommended and current indoor temperatures "may also be clearly displayed"

What, When, How often ?

Inspection of boilers:

Regular inspection of boilers fired by non-renewable fuels of an effective rated output of 20 kW to 100 kW

Boilers larger than 100 kW shall be inspected at least every two years. Gas boilers: every four years

What, When, How often ?

Boilers over 20 kW and older than 15 years:
A One-off inspection including:

Assessment of boiler efficiency

Boiler sizing compared to heating requirements

Advice on replacement of boilers or
modifications to increase efficiency of the
heating system

What, When, How often ?

Inspection of air-conditioning systems:

Regular inspection of systems with an effective rated output of more than 12 kW (3.4 ton):

Assessment of air-conditioning efficiency

Sizing compared to cooling requirements

Advice on possible improvement or replacement of the air-conditioning system and on alternative solutions

What, When, How often ?

Energy declaration:

**For public buildings and apartment buildings:
The energy declarations must be carried out by
the end of 2008.**

**Energy declaration of other buildings started
January 1, 2009**

What should be included?

Building envelope

Heating system

Cooling system

Controls

Lighting

Plug loads (EU Energy Labelling program, comparable to Energy Star)

What do you get for your money?

An Energy Performance Certificate including:

Actual building data

Actual annual energy use, total and per m², electricity and fuels

Comparison with similar buildings and with new buildings

Proposed Energy Conservation Measures

How much you can save by these ECMs, in kWh/year and in Euros/year

Other relevant information

Implementing ECMs

Is up to the building owner

As usual this depends on the ROI

There may also be public programs for partial funding of investments, especially for Renewable technologies

Who can do the Energy Declaration?

Only accredited experts

Finally:

I have one example of an Energy Declaration available, though only in Swedish. Also a Display Energy Certificate from UK. Please come have a look during the break

Further information on European Energy use and programs:

www.energy.eu

Thank You!