

European actions to improve the energy efficiency of buildings

Olli Seppänen, professor
Federation of European Heating and Air-
conditioning Associations



Climate Action: Energy for a Changing World

On 23 January 2008, the European Commission unveiled an ambitious package of proposals to to fight climate change and promote renewable energy in line with EU commitments. This Climate Action package builds on the many targets the EU set itself in 2007 for 2020 as part of the Energy Policy for the European Union including:

- 20% reduction in greenhouse gases;
- 20% increase in energy efficiency, and
- increasing renewable energy use to 20% of total energy consumption
- 10% share of bio-fuels in transport fuels by 2020





European Commission - DG TREN

Five important energy directives

Co-generation

Increase of co-generation up to 18%

Building performance – EPBD - 2002

improvement of energy performance of buildings

End use efficiency and energy services -ESD

Member States to save at least an additional 1% of their final energy consumption each year for the next 9 years

Energy using products – EuP - 2005

Free movement of Energy using products (Art 95)

All aim at protecting the environment and securing energy supply

Renewable energies – draft Jan 2008

Increase the use of renewables up to 20%





Combined heat and power generation COM 2004/8/EC: Directive on the promotion of cogeneration based on a useful heat demand in the internal energy market

- The Communities strategy outlined in the Commission's cogeneration strategy of 1997 sets an overall indicative target of **doubling the share of electricity production from cogeneration to 18% by 2010**. This was endorsed by the Member States in the form of a Council Resolution in December 1997. The indicative target was taken up in the Communication on CHP (COM(97)514 final) providing for an analysis of the barriers and strategies for its realization. Projections show that meeting this target is expected to lead to avoided CO₂ emissions of over 65 Mt CO₂/year by 2010.

● Energy Performance of the Buildings Directive (EPBD)

- **Adopted in 2002**
- **Holistic approach towards energy use in buildings**
 - Setting up of a minimum energy performance standards
 - All new and existing buildings (>1000m²) should comply with these standards
 - Energy performance certificates to be presented when buildings are constructed, sold, rented out
 - Requirement for a regular inspection of boilers and air conditioning systems above minimum sizes
- **Deadline for implementation: January 4, 2006**
- **Derogation possible for Art. 7 to 9 until January 4, 2009**
- **Unsatisfactory progress in a number of MS**
- **However, a number of good examples available and growing**



Article 4 of EPBD : Setting of energy performance requirements

These requirements shall take account of general indoor climate conditions, in order to **avoid possible negative effects such as inadequate ventilation**, as well as local conditions and the designated function and the age of the building.

CEN Standards supporting the implementation of EPBD

- Originally 31 work items
- Resulting in about 40 draft standards
- 29 out of 40 approved in the final formal voting in May 2008, totally 1674 pages
 - Heating systems
 - Ventilation and cooling
 - Energy performance calculation
 - Room temperature calculation
 - Heat losses , building physics
 - Inspections of A/C, ventilation and boilers
- Standards available from national standardization organizations



Experience from EPBD-2002

- cost effectiveness of certificates to be improved
- computerized tools needed for energy inspections
- standardized guidelines needed for experts
- certificates should be assessed
- the effects of EPBD-2002 should be monitored
- need to compare the mandatory and voluntary methods to improve boiler efficiency
- A/C inspections are not cost effective – need to move towards to reduction of cooling loads to reduce high summer temperatures, like improved solar shading etc.
- calculation methods (factors to be included) described in the annex are too complex, and need to be simplified especially for small residential buildings
- regulations should be flexible, and not to prevent innovative new solutions
- public awareness should be improved
- more practical standards are needed - especially CEN- standards dealing with inspections should be quickly revised

Recasting of the Energy Performance of Buildings Directive

- **New version will be submitted to EU-parliament in 2008**
- **Public Consultation June 2008** - 250 responses including REHVA
- **Most important issues in the recasting of EPBD 2002**
 - 1000 m² thresholds within the existing EPBD
 - Better use and improved quality of energy performance certificates and follow up
 - Requirements on boilers and air-conditioning systems, and better inspection procedures
 - Minimum energy performance requirements
 - Strengthening of the leading role of the public sector



Energy services directive

- **Member States to save at least an additional 1% of their final energy consumption each year for the next 9 years**
- **Member States to prepare national Energy Efficiency Action Plans** (first one due in June 2007)
- **Appoint a body to monitor and verify the savings obligation and the energy service obligation**





National energy efficiency plans

http://ec.europa.eu/energy/demand/legislation/end_use_en.htm

Summary of savings from EEAP of Finland

Finland's National Energy Efficiency Action Plan (NEEAP 2008–2010)

26.6.2007

Ministry of Trade and Industry
Ministry of Transport and
Communications
Ministry of Agriculture and
Forestry
Ministry of Finance
Ministry of the Environment

| Sector | 2007 GWh | 2010 GWh | 2013 GWh | 2016 GWh |
|------------------------------|--------------|--------------|---------------|---------------|
| Households | | | | |
| Buildings | 3 960 | 5 934 | 7 863 | 9 573 |
| Public sector/municipalities | 84 | 69 | 66 | 66 |
| Public sector/government | | | | |
| Private services | 144 | 90 | 102 | 102 |
| Industry (non-ETS) | 1 286 | 1 307 | 743 | 640 |
| Transport | 869 | 1 142 | 1 299 | 1 387 |
| Agriculture | 480 | 659 | 809 | 938 |
| Energy sector | | | | |
| Horizontal | | | | |
| ESD-savings total | 6 824 | 9 201 | 10 882 | 12 707 |



Scope of Energy using products directive - EuP

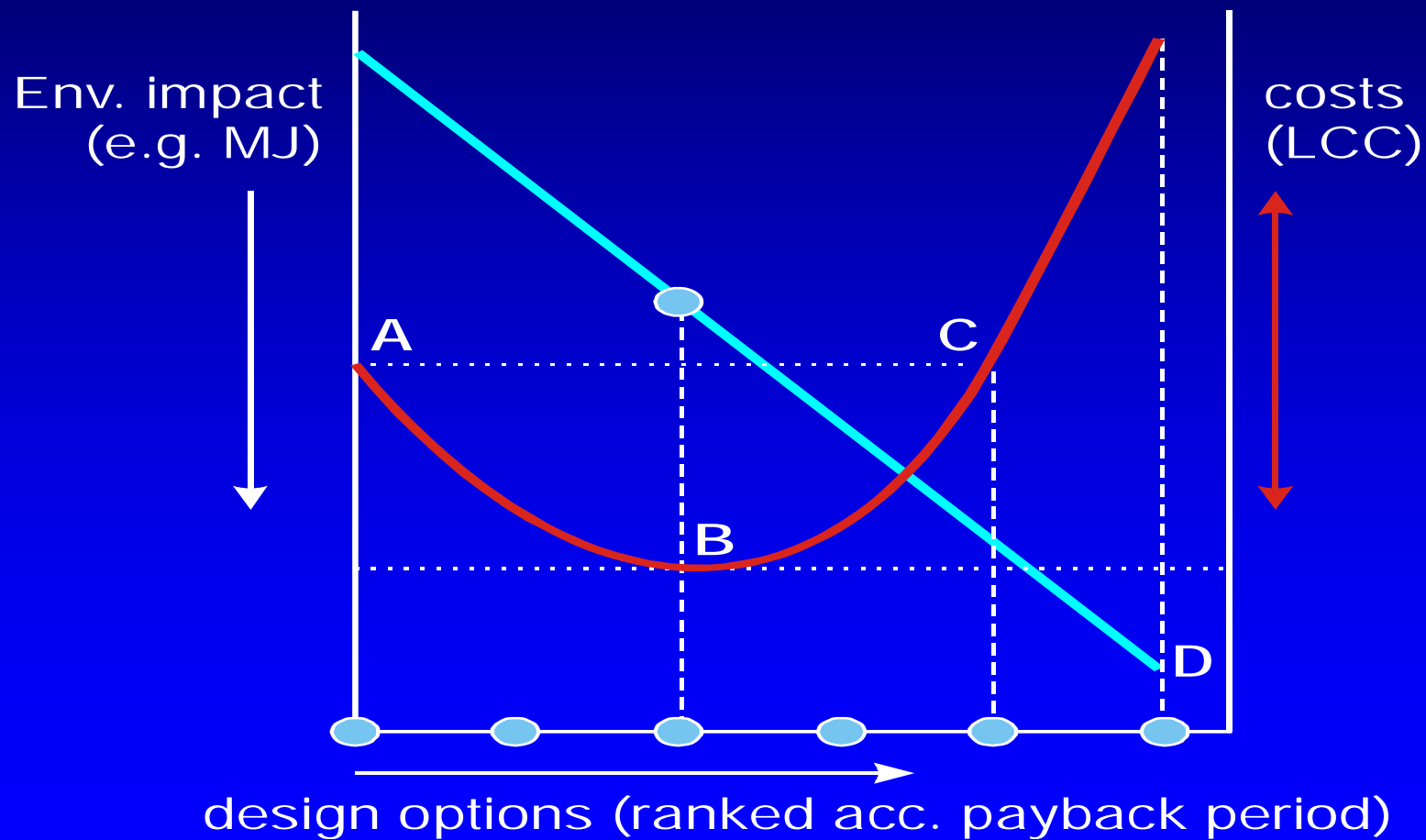
Buildings

- Directive addresses all member states
- Implementing measures address manufacturers
- Applied to all energy using products, excluding vehicles
- Sold in important quantities ~ 200.000
- Significant environmental impact + potential for improvement
- Life-cycle cost approach used in the analysis to set the criteria
- The Commission started in 2007 the process of adopting minimum energy performance standards for 14 priority products, including boilers and lighting



Life cycle cost analysis

Task 7 (detail): LCC

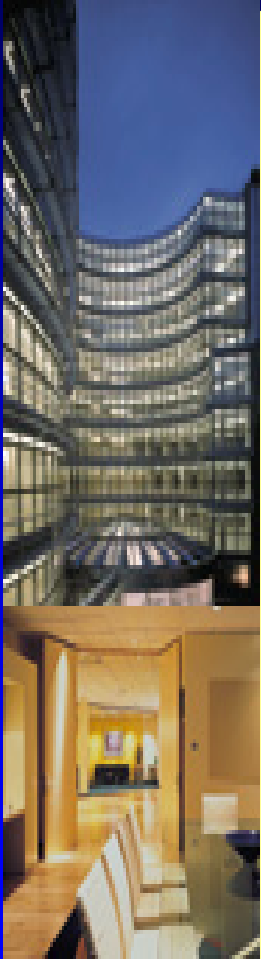




EuP –directive – first 14 product groups include

- **boilers and water heaters (gas/oil/electric)**
- **air conditioning appliances, electric motors, pumps, fans...**
- personal computers, imaging equipment, televisions
- battery chargers and external power supplies
- office and public street lighting
- commercial refrigeration and freezers
- standby and off-mode losses of EuPs

- **solid fuel combustion installations**
- domestic and industrial lighting
- vacuum cleaners and set-top boxes



www.ecoboiler.org

Working document on possible Ecodesign Energy labeling for Boilers

| "specific efficiency' of CH Boiler 'I' | energy efficiency Rating |
|--|--------------------------|
| | Smaller CH Boilers |
| $I \geq 120\%$ | A+++ |
| $120\% > I \geq 104\%$ | A++ |
| $104\% > I \geq 88\%$ | A+ |
| $88\% > I \geq 80\%$ | A |
| $80\% > I \geq 72\%$ | B |
| $72\% > I \geq 64\%$ | C |
| $64\% > I \geq 56\%$ | D |
| $56\% > I \geq 48\%$ | E |
| $48\% > I \geq 40\%$ | F |
| $40\% > I$ | G |



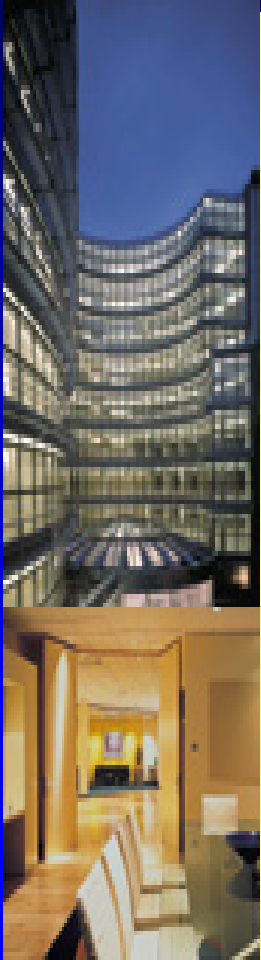
Directive on the promotion of the use of energy from renewable sources

(draft January 2008)

- **electricity, heating and cooling and transport**
 - **a 20% target for the overall share of energy from renewable sources and**
 - **a 10% target for renewable energy in transport**
 - **the proposed directive sets the principles how the use of renewable is defined, for example,**
 - **which part of the energy from the heat pump heating system can be considered as renewable**
-



Further official information from DG TREN related to energy efficiency



<http://ec.europa.eu/comm/energy/demand/legislation/>

[/buildings_en.htm](#)

[/end_use_en.htm](#)

[/eco_design_en.htm](#)

http://ec.europa.eu/comm/energy/intelligent/index_en.html

www.buildingsplatform.org

study websites such as 'www.ecoboiler.org'





The Intelligent Energy Europe Programme

Converting policy into action



http://europa.eu/agencies/executive_agencies/ieea/index_en.htm

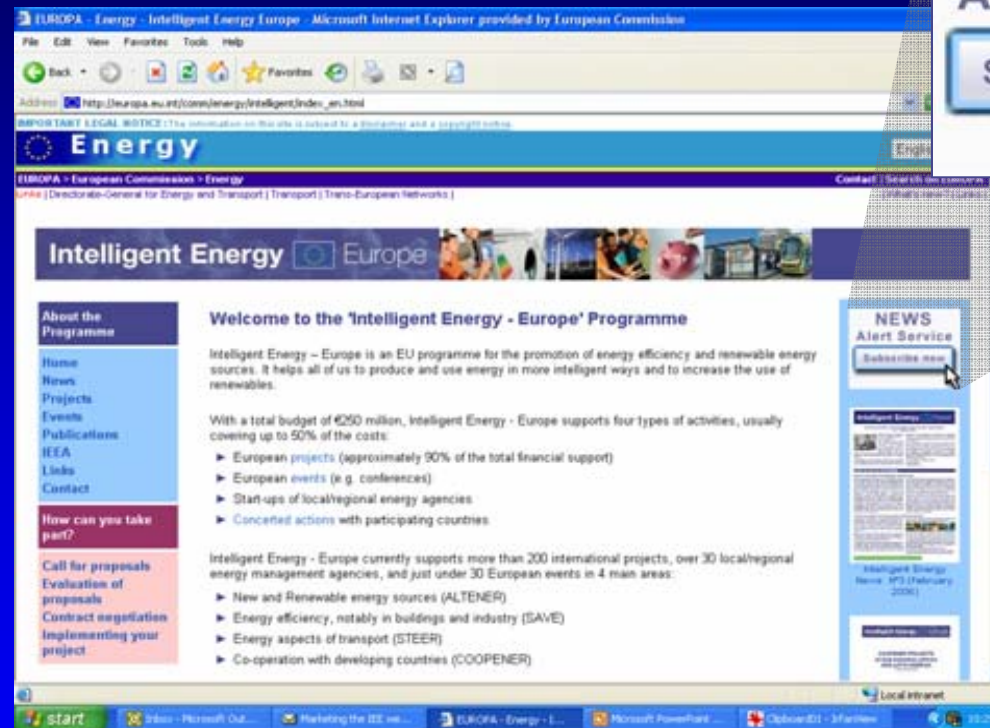
New name 2007 : Executive Agency for Competitiveness and Innovation -EACI

Intelligent Energy  Europe



THE IEE WEBPAGE: MAIN SOURCE OF INFORMATION

- Details of 340+ European projects
- Intelligent Energy News
- List of supported events
- Calls for proposals & how to apply
- Support for partners
- Contacts & help



http://ec.europa.eu/energy/intelligent/index_en.html





IEE PROGRAMME (2007-2013)

| YEARS | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Total 2007-2013 |
|------------------------|------|------|------|-------|-------|-------|-------|--------------------|
| IEE 2 Budget (mio€) | 65.0 | 70.4 | 88.3 | 109.2 | 112.6 | 131.2 | 150.6 | 727.3 |

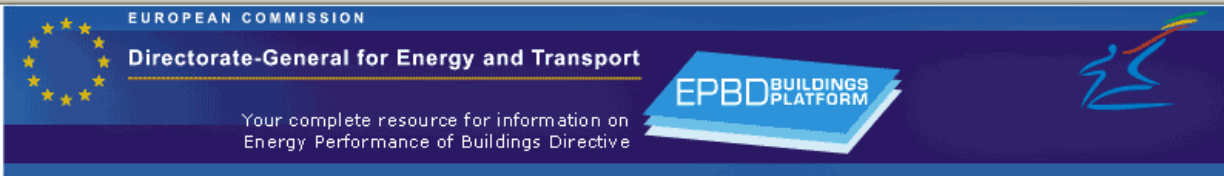
- Gradual increase of programme budget from 2007 to 2013
- Budget to support market replication projects (from 2008)
- Complementary to FP7 and Structural Funds
- Annual Work Programmes / Calls for Proposals
- Adoption of Work Programme 2007 and first Call Sep 28, 2007
- Second call in June 2008

Intelligent Energy  Europe

Promotion of EPBD through Buildings Platform



- The EPBD Buildings Platform is an information service for helping the implementation of the Buildings' Directive
- The Platform has been launched by the European Commission in the frame of Intelligent Energy – Europe Programme
- The Buildings Platform acts as the official EC information channel for EPBD related issues



Login | Search: Go | Contact | Language

- Home
- The directive
- Themes
- Information Papers
- Helpdesk
- Newsletter
- Publications and downloads
- Standards & tools
- Events
- Links
- About the Platform

:: EPBD: Energy Performance of Buildings Directive

Reducing the energy use of buildings without compromising the indoor environment and services is the key challenge for Europe. The implementation of the Energy Performance of Buildings Directive provides Europe with tools for this.

The **EPBD Buildings Platform** is an information service for helping the implementation of the Buildings' Directive, and in particular on **5 main themes** namely, [certification](#), [inspection of boilers and air-conditioning systems](#), [requirements for experts and inspectors](#), [calculation procedures](#) and [minimum energy performance requirements](#). This service is useful for practitioners and consultants, experts in energy agencies, interest groups and national policy makers in the 25 Member States plus Bulgaria, Romania and Cyprus.

Its objective is to support the Commission in the implementation of the Directive by:

- Providing input and tools to support the Commission and the Member States in the follow-up and evaluation of the impact of the Directive.

The EPBD Buildings Platform has been launched by the European Commission in the frame of the Intelligent Energy - Europe, 2003-2006 programme.

Note to our visitors:
Navigate through our site but please visit us again soon. The site is still under development and various databases will be included in order to offer you more services in the weeks and months to come. If you want to be kept informed about new developments, don't forget to [register](#).

> Latest News

- :: Information paper on **implementation of EPBD in Denmark** - P09
- :: Information paper on **minimum energy performance requirements** - P10
- :: **Newsletter n°5** - October 2006
- :: EPIC AIVC Conference, Lyon (France) - 20-22 November 2006 [\[more\]](#)



Databases



- Database of **publications**
- Database of **standards**
- Database of **events**
- **Newsletter** database
- **FAQ** database
- Database of **websites**
- Database of **software tools**



Supporting EU-projects

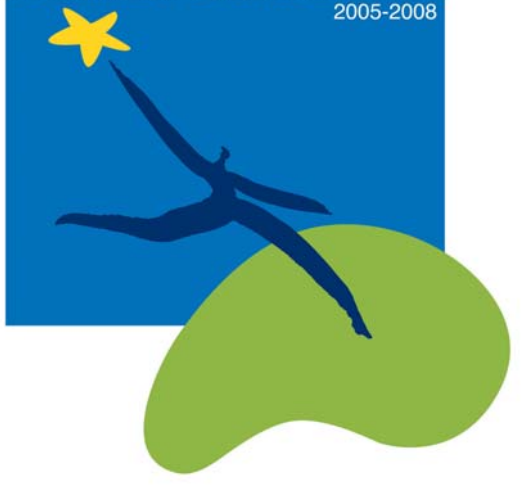
managenergy 

www.managEnergy.net

ManagEnergy

- Excellent source of all energy related information
- Several languages
- Policy
- Future plans
- Directives
- Events

SUSTAINABLE ENERGY EUROPE
2005-2008



www.sustenergy.org

Sustainable Energy Europe Campaign

- A European Campaign to raise awareness and change the landscape of energy

The logo for AUDITAC, featuring the word "AUDITAC" in a stylized font. "AUDIT" is in black and "AC" is in blue.

AUDITAC:

Field benchmarking and Market development
for Audit methods in Air Conditioning

[www.energyagency.at/\(en\)/projekte/auditac.htm](http://www.energyagency.at/(en)/projekte/auditac.htm)



BUDI:

Pilot actions to develop a functioning market for
energy performance certificates

<http://www.buildingdirective.org/>



ENPER-EXIST:

Applying the EPBD to improve the Energy
Performance Requirements to Existing
buildings

<http://www.enper-exist.com/>



EPA-NR:

Energy Performance Assessment
for Existing Non Residential Buildings

<http://www.epa-nr.org/>



EPLabel :

A programme to deliver energy certificates for display in public buildings across Europe with a harmonising framework

<http://www.eplabel.org/>



E-TOOL :

Energy-toolset for improving the energy performance of existing buildings



Impact :

Improving energy Performance Assessment and Certification schemes by Tests

<http://www.senternovem.nl/impact>



STABLE :

Securing The Take Up of Building Energy Certification by Improving Market Attractiveness through Building Owner Involvement

<http://stable.motiva.fi/>



TOWARDS CLASS A: Towards Class A - Municipal Buildings as Shining Examples

<http://www.display-campaign.org/>



www.buildingadvent.com



www.energyagency.at/projekte/harmonac.htm



www.asiepi.eu/

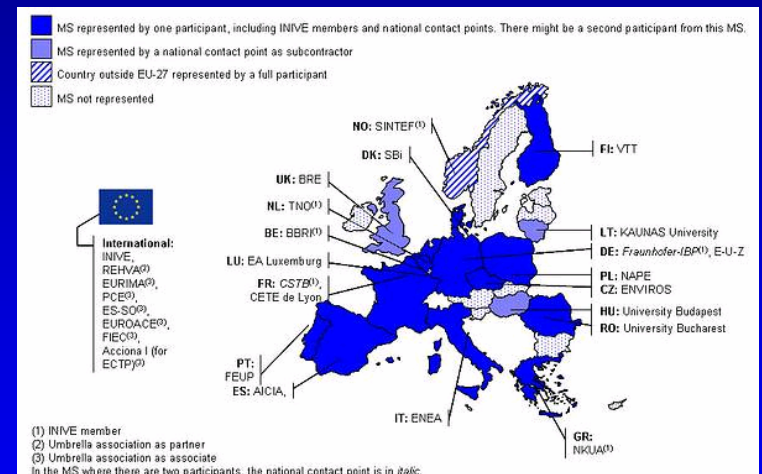


One of these new projects is CENSE.

CENSE specifically aims to serve as the gateway to an effective application of the CEN standards in the Member States.

Project website:
www.iee-cense.eu/

www.iee-cense-eu



Summary and conclusions

EU energy policy established- leading role in the world

Important directives set the goals for future work

- **Co-generation: energy industry + small scale applications**
- **EPBD: building design, construction and operation**
- **EuP: manufacturers of energy using products**
- **ESD: administrators, action plans, supporting measures, energy efficiency services**
- **renewable energies directive -proposal**

CEN: supporting standards for harmonized national practices

Intelligent Energy Europe Program for energy savings and renewable energies - demonstration and dissemination

Professional organizations like REHVA – supporting work, dissemination and training