Ecofys VII study
U-Values for Better Energy Performance of Buildings

24 April 2008, Vilnius, Lithuania
1. Who is Eurima?
Eurima

Eurima is the European Insulation Manufacturers Association and represents the interests of all major mineral wool producers throughout Europe, including companies such as Knauf Insulation, Rockwool, Saint Gobain-Isover, Ursa Insulation, Paroc.

Members of Eurima operate in Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

In manufacturing mineral wool, members of Eurima help to achieve important social and environmental goals: saving energy, minimising pollution, combating noise, reducing the risk of fire and creating European jobs.

Eurima represents 20,000 employees in Europe and the installation of mineral wool keeps many more Europeans at work.
Member companies
What is the role of Eurima?

• Eurima does scientific research on energy efficiency in buildings to contribute to the European debate on behalf of the members.

• Eurima is active at EU level to advocate the benefits of energy efficiency in buildings and make it work!

• Eurima also works with national associations in most European countries.
2. The energy efficiency potential in buildings in Europe
"the most sustainable energy is saved energy"

1st: minimise energy loss

2nd: use renewable energy sources

3rd: efficient use of fossil energy sources
Supporting the development of a low carbon economy in Europe

- EU unlikely to meet Kyoto objectives
  - No action
  - Action: Buildings alone have the potential to reach Kyoto objectives

- Increasing dependence on foreign energy sources
  - No action
  - Action: Reducing energy demand in buildings can help limit our exposure to supply issues

- EU Lisbon objectives not achieved
  - No action
  - Action: Improving energy efficiency improves economic development
ECOFYS reports - quantifying the potential in the building sector

Climate Protection

Regulation

Cost Effectiveness

Enlarged EU

Price Scenario
Key figures from Ecofys reports

- 40% - Energy consumption by buildings in Europe.
- 460 million tonnes - Potential CO2 savings in the building sector in Europe.
- 3.3 million barrels of oil - Equivalent of what Europe’s buildings consume due to a lack of energy efficiency.
- 270 billion € - Cost due to a lack of basic energy efficiency measures in buildings.
- 560,000 - Job potential from an active strategy to deploy energy efficiency in buildings.
- 10% only - The energy saving potential tapped by the current EPBD
3. Ecofys VII
setting up a new landscape
Starting point...

EPBD
whole building energy performance

National or regional whole building requirements

Energy performance requirement per building component

U-values
either as design criteria or component requirement

in practice

Economic optimum

Environnemental goals
New recommendations for all buildings in Europe

- Recommended U-values based on cost effectiveness and climate protection.
New recommendations to respond to heating and cooling demands

Heating demand + Cooling demand

HDD climate map

CDD climate map
Rationales
Rising challenges

Rising energy prices

Rising climate change effects
Much more needs to be saved in the building sector

85%

Potential in buildings that needs to be tapped by 2050 to achieve climate change objectives
Time is not on our side

The building stock in 2050, which has to deliver the 85% CO₂ reduction, includes the buildings that we start to renovate now!

There is an urgent need for regulation in the renovation!
Defining and Positioning U-values in Ecofys VII
Background

1. Climate conditions:
   heating and cooling degree days maps in Europe

2. Insulation for heating and cooling
   - Climate zones
   - Construction type
   - Building components
   - Other important factors
Building component and insulation

U-value optimum for heating and cooling demand

- Criteria: cost effectiveness
  - Energy price: WEO 2006 - Peak Price
  - Investment costs
  - Interest rate
  - Energy mix
- Criteria: Post Kyoto target
U-value optimum for heating and cooling demand

- 100 cities
- Investments versus annual running costs
  - Interest rate Service lifetime 30 years
- Impact factors
  - Energy prices: WEO 2006 (IEA scenario) & Peak Price (=US$70 fixed); fuel mix, incremental costs for 1cm insulation/component
- Group starting points for cost analysing
  1. Scandinavia
  2. Moderate zone EU15 + Switzerland
  3. Warm zone EU15
  4. New EU8+2+Balkan countries
Savings in heating and cooling

Costs +

Costs -

Insulation thickness

Energy savings

cooling

heating
The principle of cost effectiveness
Defining cost optimum U-values

Source: Better Buildings through Energy Efficiency
A Roadmap for Europe
page 10

Minimum performance for all new buildings
Reasonable achievable with good design and building practice
Maximum level that can be achieved in the current context

Costs +

cost-neutral
Positioning cost optimum U-values

EXISTING HOUSING STOCK

Present NEW BUILDING REQUIREMENTS

U-value

1,00

EXAMPLE

EXHIBIT

1,00

0,45

0,40

0,35

0,30

0,20

0,15

BEST PRACTICE

STATE of the ART

cost-neutral

minimum
Current recommendations are far below what is necessary

- Comparison with existing U-values requirements in EU 27 confirms how much cash is being wasted.

- National and regional standards are far below what is necessary.

- We invite member states to analyze U-value requirements
Appraisal of current insulation recommendations by Ecofys VII
Results on cost-effectiveness and climate protection are almost identical

Optimum U-values recommendation

Cost optimum = Climate ready recommendations
Example: U-values roof

Present U-values

U-values based on WEO2006 price

U-values based on peak-price
U-values: cost effectiveness and climate

- The recommendations are based on cost efficiency and climate targets.

- Results should be understood as the minimum recommendations from EU.

- It is the responsibility of each country to optimize the implementation taking into account other factors:
  - regional climate conditions, heated floor/wall, condensation risks, etc.
Post-Scriptum...
Support measures are also crucial

- **Upfront financing** is key (e.g. EU Structural Funds).

- Any policy packages have to include a good set of organisational support measures.
THANK YOU!