



# **European Policies for Energy Efficiency and Use of Renewable Energy Sources in Buildings**

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Sustainable Energy and Social Housing  
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for the Transposition of the Energy Performance Buildings Directive ( EPBD)

## The main EU Policy Instrument for Building Energy Efficiency



# Energy Performance of Buildings Directive

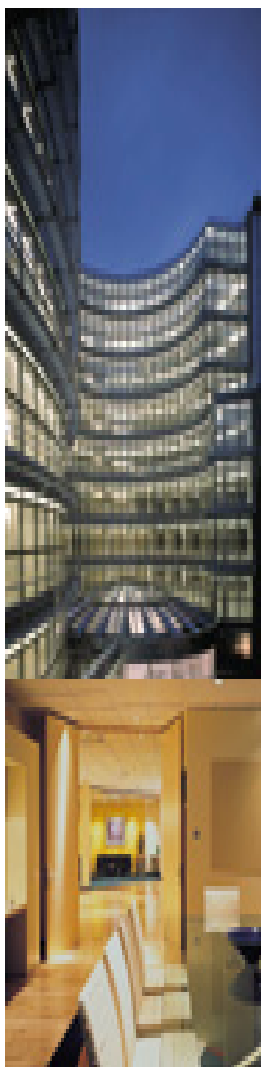
**Directive 2002/91/EC**

**16 December 2002**

**published 4 de January 2003**

**To having been transposed by 4 January 2006**

**And to be fully implemented by 4 January 2009...**



# Improving the energy performance in buildings: why ?



## The EU needs to promote energy savings

Three main reasons.

### Security of supply

External energy dependence 70% in 2030 if no measures taken

### Environment

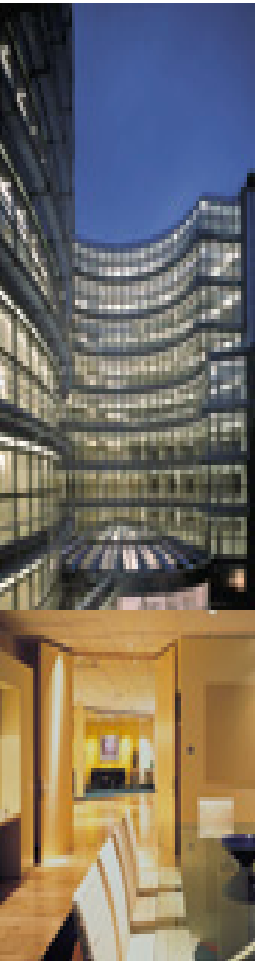
Energy production and use create 94% of CO<sub>2</sub> emissions

### Limited influence on supply

The EU can promote savings in energy use

## Impact of action on energy use in buildings

- Largest end-user : 40% of energy is used in the residential/ tertiary sectors
- Large energy savings potential in the building sector: 22% by 2010



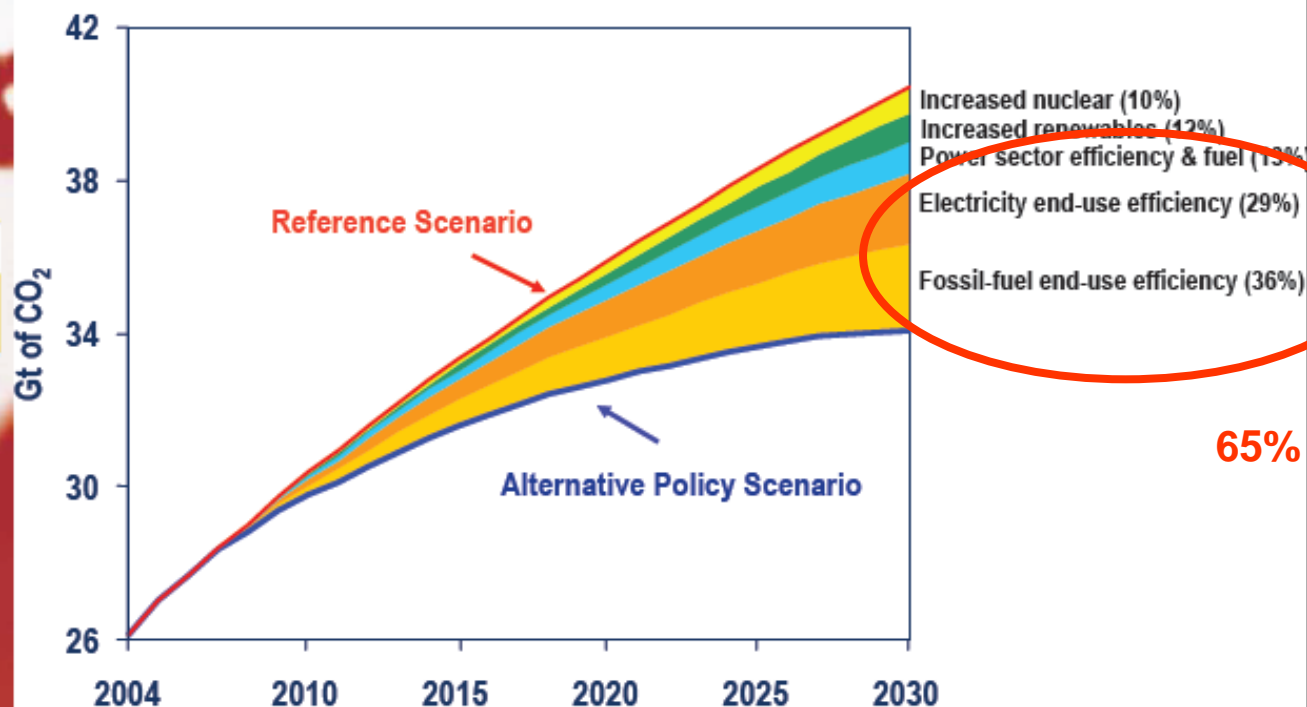
## IEA Studies point in the same direction

WORLD  
ENERGY  
OUTLOOK

INTERNATIONAL  
ENERGY AGENCY



### Alternative Policy Scenario: Key Policies for CO<sub>2</sub> Reduction



*Improved end-use efficiency accounts for two-thirds of avoided emissions in 2030 in the APS*

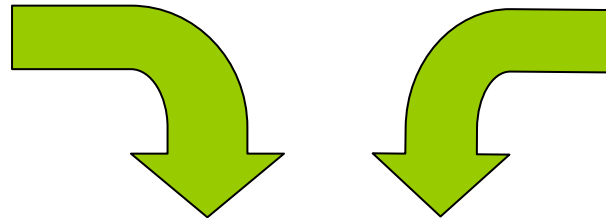


# INTEGRATING ENERGY & ENVIRONMENT



**Energy Policy for Europe  
(Strategic Energy Review)**

**Limiting Global Climate  
Change to 2°C**



## **STRATEGIC OBJECTIVE**

**A unilateral *EU* independent commitment of  
at least **20%** GHG emission reduction by  
2020, compared to 1990 levels  
And a 30% reduction if broader participation**

# ENERGY EFFICIENCY

**Saving 20% energy by 2020**



Energy Efficiency Action Plan - adopted on 19 October 2006

- Realising the Potential:
  - Transport - fuel efficient cars; better use of public transport; introduction of biofuels
  - Appliances - tougher standards and better labelling
  - **Buildings** - improving the energy performance of the EU's building stock
  - Improving the efficiency of heat and electricity generation, transmission and distribution



## THE KEY DRIVERS 3x20% by 2020

**20% by 2020  
EFFICIENCY**

**By 2020 20% EU GHG**

**By 2020 20% RENEWABLES**

**BIO-FUELS**

**10 % 2020  
binding**

**E-ELECTRICITY**

**HEATING & COOLING**

**NATIONAL TARGETS and ACTION PLANS**



## National Energy Plans



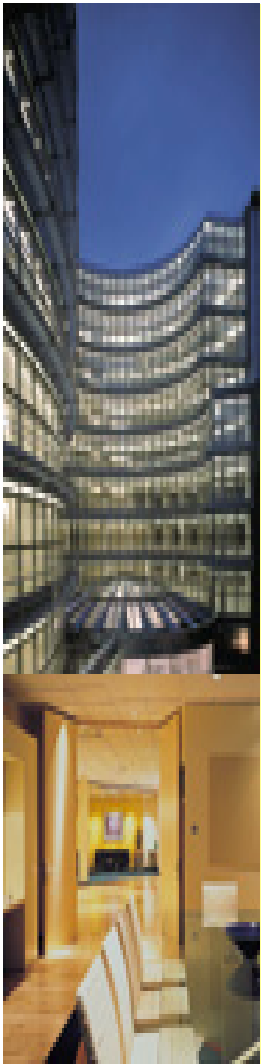
### Energy End-Use Efficiency and Energy Services Directive

**Directive 2006/32/EC**

**To be transposed in 2007**

**It requires 1%/year energy consumption savings until 2015 – a very difficult target to reach without a serious effort on buildings, new and existing...**

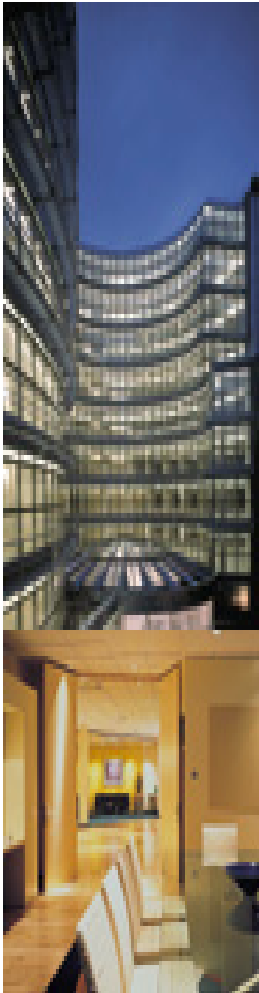
**But, like the EPBD implementation, the National Energy Plans are delayed in most EU Member States...**







# EPBD OBJECTIVES



## Objectives

- Promoting the improvement of energy performance of buildings within the EU through cost-effective measures, with no compromise to comfort and Indoor air quality.
- Convergence of building standards towards those of Member States which already have ambitious levels.

## The measures

- Apply a Methodology for integrated building energy performance standards based on common minimum requirements
- Application of these standards on new and existing buildings
- Certification schemes for all buildings
- Inspection & assessment of boilers/heating and cooling installations

## The measures

### Latest count of transpositions (out of 25):

- Apply a Methodology for integrated building energy performance standards based on common minimum requirements **21**
- Application of these standards on new and existing buildings **13**
- Certification schemes for all buildings **12**
- Inspection & assessment of boilers/heating and cooling installations **12 / 7**



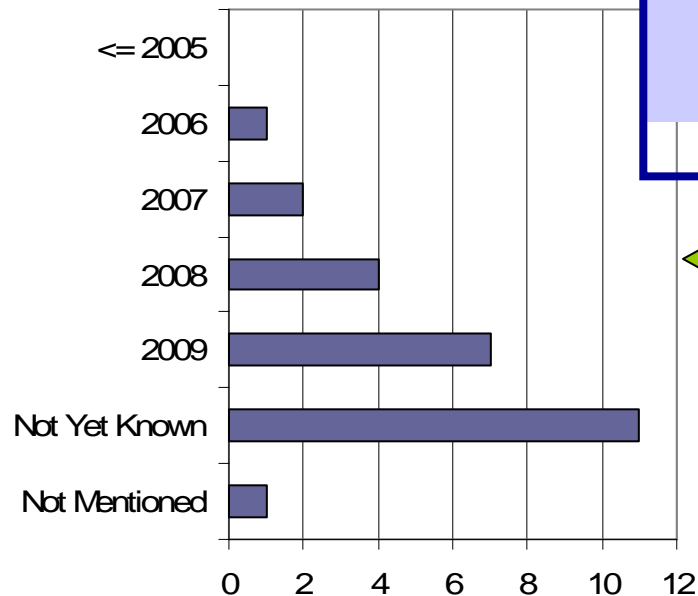
**It is obvious that there are major delays in the implementation of the EPBD in almost every MS, especially for certain topics**

**Timing for starting:  
Issue Certificates for  
Residential Buildings**



| By:           | 2006     | 2007     | 2008     | 2009     | Undecided |
|---------------|----------|----------|----------|----------|-----------|
| <b>New</b>    | 5<br>19% | 8<br>48% | 6<br>70% | 3<br>81% | 5         |
| <b>Exist.</b> | 5<br>19% | 3<br>30% | 4<br>44% | 8<br>74% | 7         |

Art.8 - AC- Start



**Timing for starting:  
Inspections of AC systems**

**Existing buildings and inspections of  
boilers and AC systems are clear  
problems.**

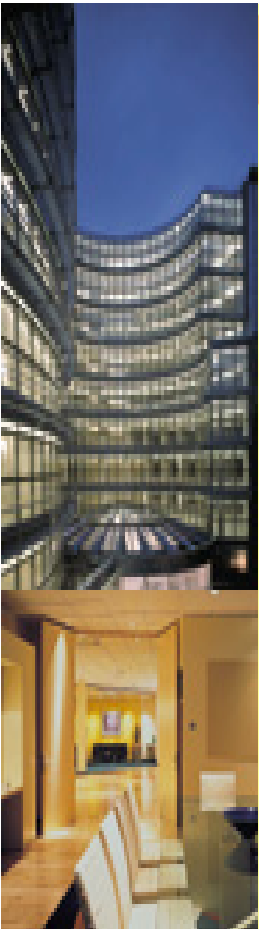


## Why so many long delays?

- The EPBD approved, and rightly so, as a prime example of the subsidiarity principle (buildings and markets are widely different throughout Europe).
- The EPBD states the goals that must be reached, but it lets MS a wide range of freedom to implement them.
- The measures that must be implemented involve added costs for the population (certificates, inspections, ...) and there is always a lot of discussion by legislators about measures that impose new responsibilities upon citizens, seen as burdens and “vote losers”.
- National Energy Efficiency Plans shall offer incentives and financial assistance mechanisms - the EPBD and the ESD must be implemented in a self-coordinated way
- The technical options are also quite wide, and there is often a lack of consensus within the technical community about the best option to adopt in each case – decisions are delayed...
- Some of the measures (e.g., inspection of boilers and AC equipment), in certain cases (e.g., small units in countries with low needs), have questionable cost-effectiveness.



## Minimum standards for all buildings



### New buildings

**Application of the minimum energy performance standards to all new buildings. Requirements should become more demanding than pre-EPBD national standards, and revised, at least, every 5 years.**

**Consider the feasibility of renewable energy, CHP, etc., for all new buildings over 1000 m<sup>2</sup>.**

### Existing buildings

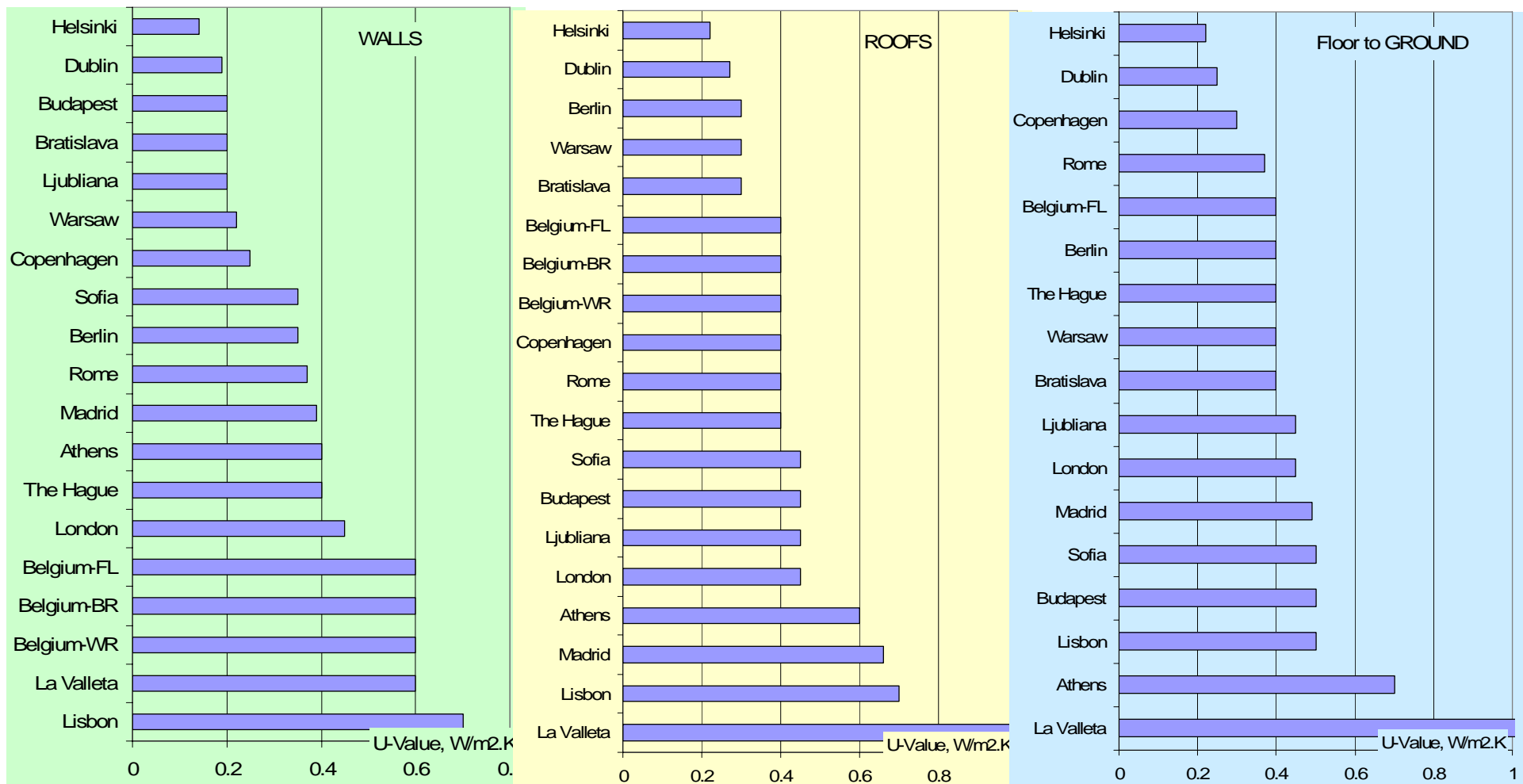
**Application of the minimum energy performance standards to existing buildings larger than 1000 m<sup>2</sup> when they undergo a major renovation.**

**Most MS are adopting new, improved, more demanding building regulations.**

**Integration of Cooling requirements and difficult issues still lagging.**

## Art.4 – Minimum Requirements

- Minimum U-values (indicative, often combined with global consumption targets)

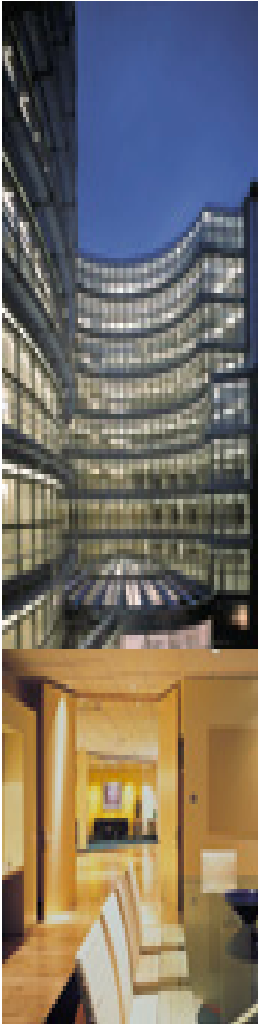


County improvements ranged from 1% to 50%...

with na overall 25% average increase in energy efficiency requirements.



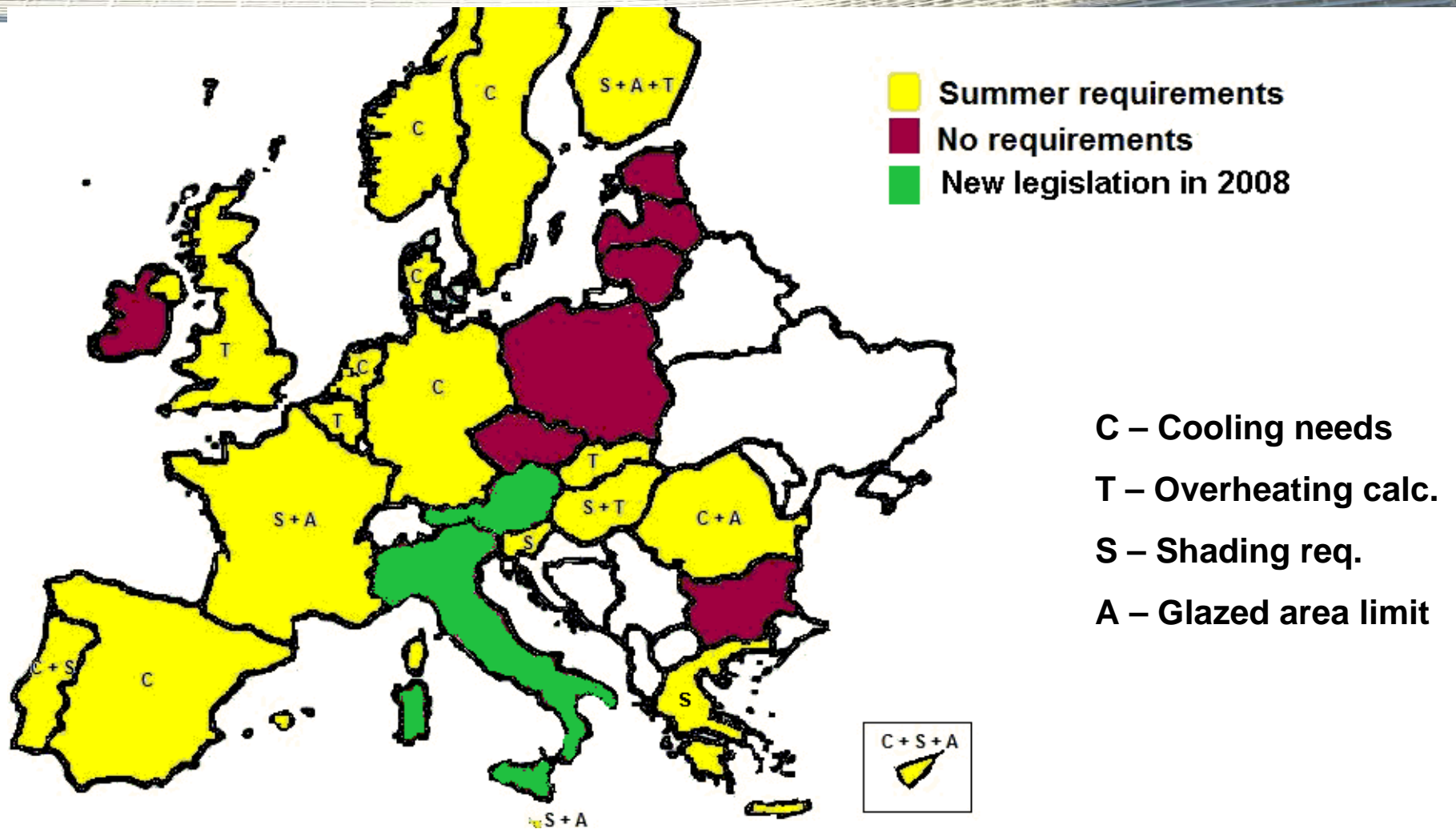
# Summer requirements in the new EU Building Regulations



- Unlike Winter regulations, Summer requirements in the EU countries adopt different strategies.
- Main approaches:
  - Overheating avoided (calculate  $T_i$ ) – 7 countries
  - Cooling needs (energy) limits – 10 countries
  - Required shading of glazed areas – 8 countries
  - Max. area of glazing – 5 countries
  - No requirements – 3 countries
  - Planned for 2008 (no details yet) – 2 countries



## A geographical overview





# ENERGY CERTIFICATES



**Energy certificate**

| Building Energy Performance                                    |  | As built     |
|--|--|--------------|
| Space to make reference to the certification scheme used       |  | Asset rating |
| Very energy efficient  |  | C            |
| A  |  |              |
| B  |  |              |
| C  |  |              |
| D  |  |              |
| E  |  |              |
| F  |  |              |
| Not energy efficient   |  |              |
| G  |  |              |
| Name of the indicator used                                     |  | Unit         |
| Space to include additional information on building energy use |  |              |
|  |  | calculated   |
|  |  | 130          |



# There are many variations in the form of the Certificates....

**СЕРТИФИКАТ**  
CERTIFICATE FOR ENERGY PERFORMANCES OF A BUILDING

Category:

No:  Valid till:

Building:

Photo of the Building!

consumption

STANDARD

Energy labelling

**Energy labelling of the following**  
Address: Storgade 27 A og B  
Postal code/city: 9990 Storstad  
BBR no.: 12345-1  
Valid 5 years from: 8 august 2006  
Energy consultant: Jens Pedersen  
The energy labelling informs about the building savings, the break-down of the building's energy consumption. The energy labelling is prepared by required by law.

**Reported energy consumption for heating and duties:**

• Costs including VAT and duties: 293.000 DKK/yr

• Consumption: 526 MWh/year

• Reported for the period: January 1st 2005 – December 31st 2005

The reported energy consumption and costs are climate corrected by the energy consultant. Thus, the figures express an average year temperature-wise.

**Cost-effective savings**

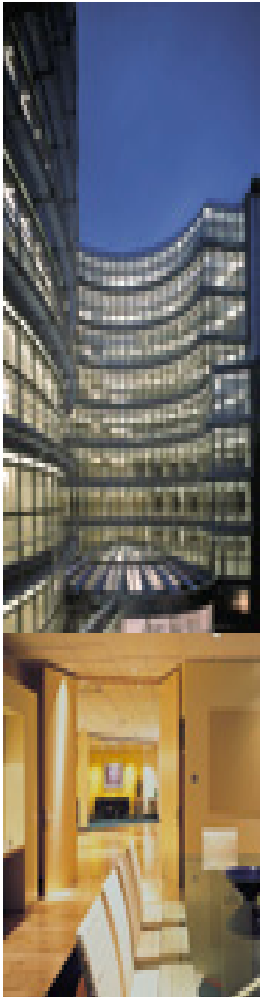
Here are the energy consultant's proposals to reduce the energy and water consumption in the building. There may be more proposals on the next page. The proposals below are elaborated in the building inspection section.

**High consumption**  
A1 is the best energy label that can be achieved, then A2, then B1, etc. G2 is the worst.

But, despite the differences, we can all “read” the same type of message in any of the certificates...



# The New Rules for Certification of Buildings

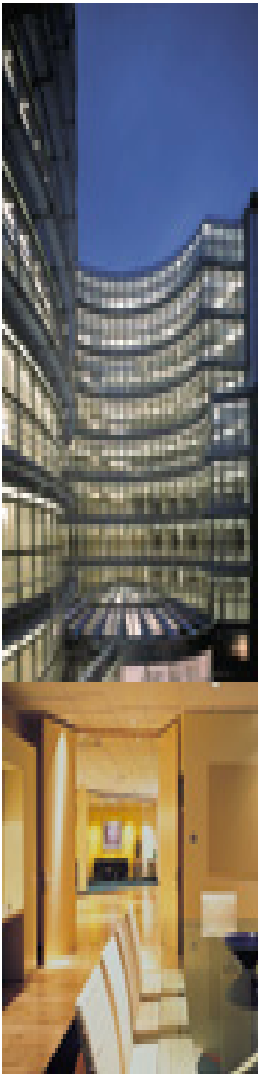


- ◆ When buildings are constructed, sold or rented out an **energy performance certificate** is to be made available to the buyer or tenant (**but: by building, by apartment, measured or calculated rating,...?**)
- ◆ **Public Buildings** to set an **example** by being certified regularly and visibly (**but: what is a public building?**)
- ◆ All large buildings visited regularly by the public to **display energy certificate prominently** (**but: what is a building regularly visited by the public?**)

**It is relatively easy to publish new building regulations. But starting a brand new certification scheme for millions of buildings is a difficult undertaking and it involves a huge logistic problem.**



## Integration of Renewables



- The philosophy of the EPBD is based on well-known basic principles:
  - First, reduce energy needs
  - Second, use as many renewables as possible
  - Third, use efficient active systems to provide for the remaining (reduced) needs
- The EPBD requires a feasibility study for renewables for large buildings ( $>1000 \text{ m}^2$ )
- However, very few countries have such requirements in their national regulations (or normal building practices)



## The SHE project



- Demonstrate sustainable solutions for social housing at least 20% better than required by Regulations, and within normal budgets
- with Renewable energy (normally, solar collectors)
- Lead to voluntary decisions by national authorities to adopt the SHE principles as the rule for new Social Housing projects
- The recently launched (31 Jan 2008) **Convenant of Mayors** extends this voluntary commitment to their cities
- It is possible to do better than what most legislators have the courage to require as national Laws.



# Renewables

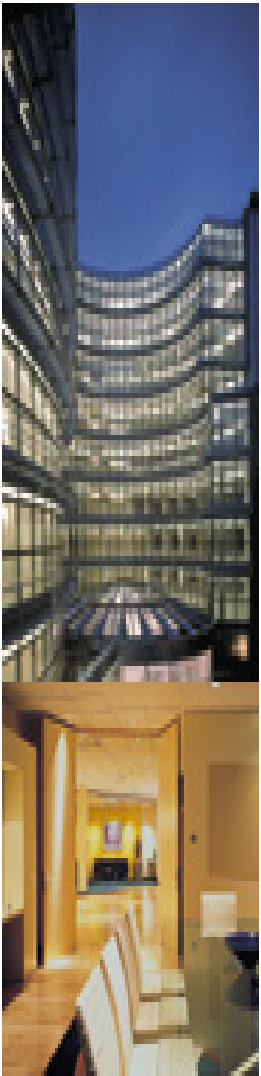


**New construction in countries requiring renewables in buildings is starting to change the landscape...**





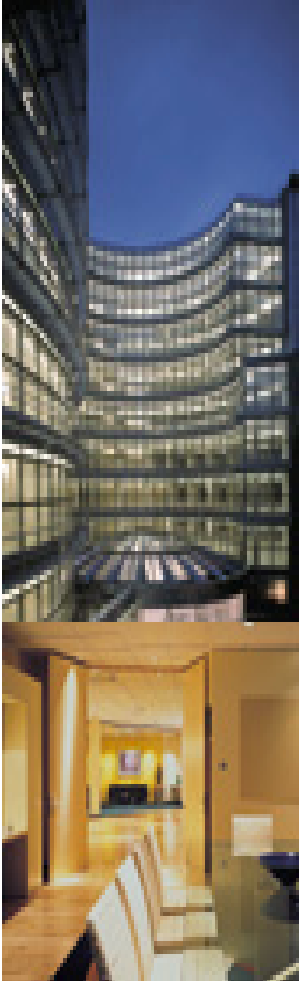
## Existing Buildings



- **New buildings represent 1-2%/year of the building stock**
- **Most of the existing building stock, namely, social housing, is quite inefficient, and it will be around for the next 50 years...**
- **To reach the target of 20% energy savings by 2020, most of the existing buildings must be improved and brought to current standards**
- **This will require a major financial effort, but it is an excellent business opportunity for the national economies**
- **This should certainly become a priority activity for Social Housing organizations**
- **Energy Certification shall quickly identify the best candidates for intervention**



## Future Perspectives



- **The EU Council approved the “Energy Action Plan” in March 2007;**
- **This Plan explicitly includes the intention to revise the 2002 EPBD towards a higher level of requirement:**
  - **MS to meet certain mandatory energy-efficiency levels, rather than leaving these targets entirely to the individual initiative of the EU MS;**
  - **Prepare the path for every new building to perform as what a few countries today designate as “passive building” standards;**
  - **Remove the 1000 m<sup>2</sup> limit for required improvements when rehabilitating**





**But the legislative process is slow...**

● **INDICATIVE Timeline**

- End 2008 – adopted by the Commission
- Co-decision:  
Council of Ministers / European Parliament  
+ about 2 years
- Transposition  
+ about 2 years
- Implementation  
+ X years (depending on the requirements)

**Can we afford to wait this long?**



**Will this have any effect by 2020?**



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## :: EPBD - Energy Performance of Buildings Directive

### 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](#).

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. 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 and Romania.

Its objective is to support the full and continued implementation of the EPBD by:

## > [News](#)

### :: **Buildings performance congress**

(Frankfurt, 23-27 April 2006) [[more](#)

### :: **EPBD conference**

(Budapest, 10-12 May 2006), with the special SAVE-ENPER-Exist session [[more](#)

**Let's however conclude on a very positive note!**



- Yes, many challenges still remain, and there are delays.
- **But a lot has already been accomplished!**
- All MS building regulations were improved... although many (most?) countries could do a little better indeed...
- **With a delay, with more or less enthusiasm or level of detail, Energy Certification of buildings will become a reality in every EU country quite soon...**
- The targets of the national Energy Plans will bring additional pressure (and funding) for building energy efficiency
- **After this first round, the new political negotiations for revising the EPBD in 2009 will create another measurable leap towards building energy efficiency...**
- In the meantime, voluntary measures taken by **cooperatives, social housing organizations, cities** and others will offer some additional progress and keep the Sustainability issue in the limelight, showing that we can all do a little better.
- **This must be taken as a continuous process towards the larger overall goal, a small step at a time...**





**Although the foundations  
have been laid...much work is  
still to be done**

**And it will take a few years to  
get to where we wish...**