



Buildings and energy consumption

Facility management conference – BRITA-in-PuBs project
FFE&M, 31 March 2008

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Content

- Energy Performance of Buildings Directive (EPBD)
- Energy policy
- Building stock knowledge and energy savings
- EU - Projects
 - Concerted Action 1 and 2
 - Buildings Platform
- Main challenges for EPBD revision

Background for the EPBD



The EU needs to promote energy savings

Three main reasons.

Security of supply

External energy dependence 70% in 2030 if no measures taken

Environment

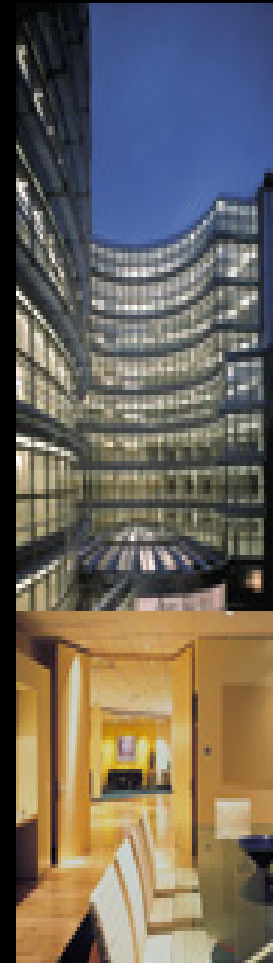
Energy production and use create 94% of CO₂ emissions

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 with cost-effective measures: 22% by 2010 (estimate in 1998)



Objectives of the EPBD

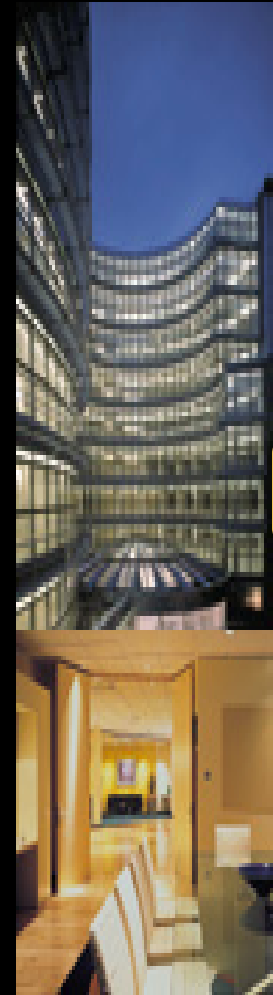


Objectives

- 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





Energy Policy for Europe – "3 x 20 %"

Energy Plan – The European Commission - March 2007

- Reduce the Greenhouse Gas Emissions by 20 % before 2020
- Reduce energy consumption by 20 % before 2020
- Incorporate 20 % renewable energy in overall energy sources in Europe before 2020

New plan from the government January 2007

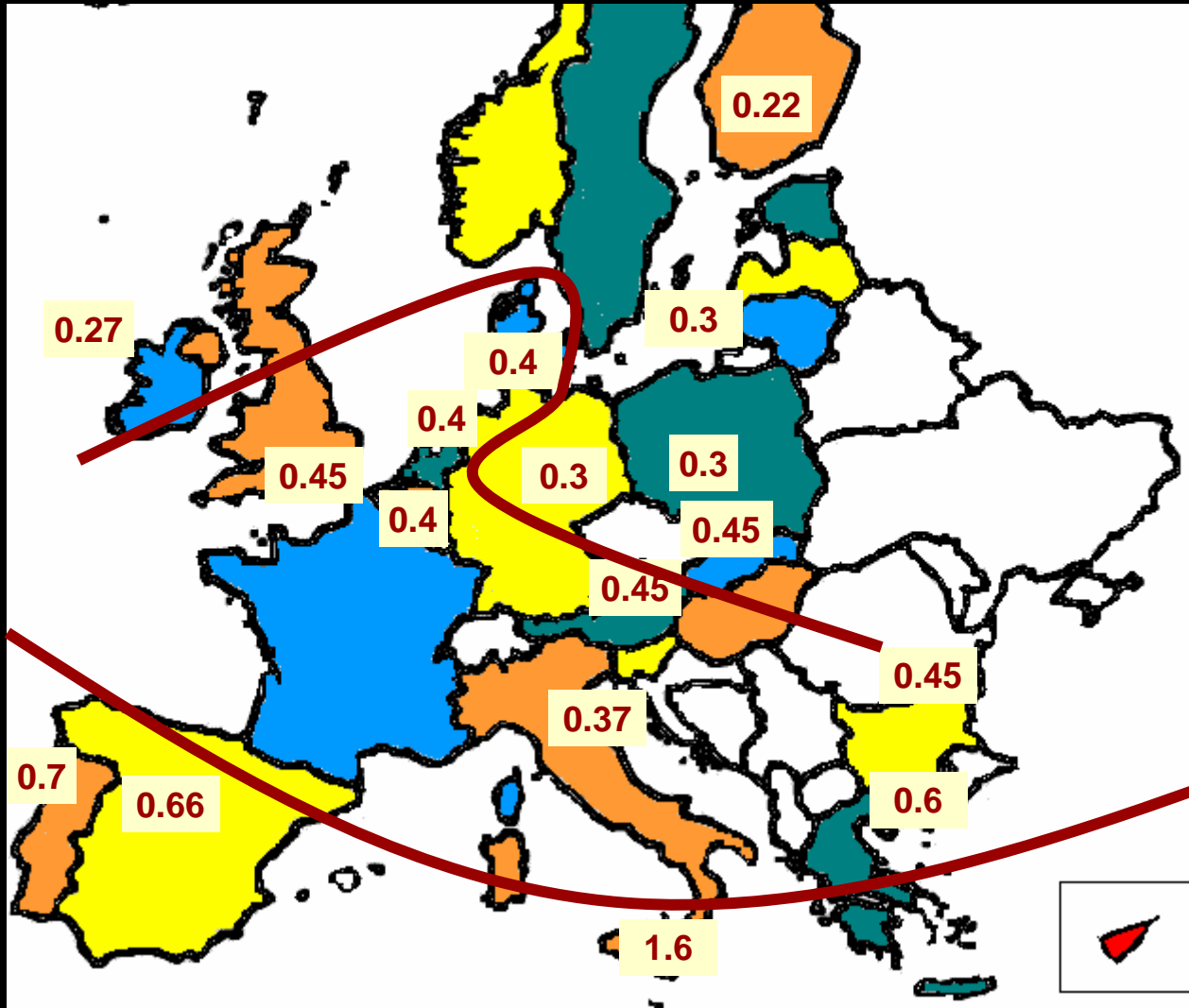


- Energy efficiency and energy savings up till 2025
- The share of renewable energy supply has to be increased from 15 to 30 %
- Energy savings in buildings is further increased to 1,25 % per year
- 10 % of fuel consumption in transport has to be by bio fuel
- Research in energy will be doubled to 1 bill. DKK (135 Mill. Euro)

EU countries increased requirements



by an average of 25 % from levels prior to the EPBD



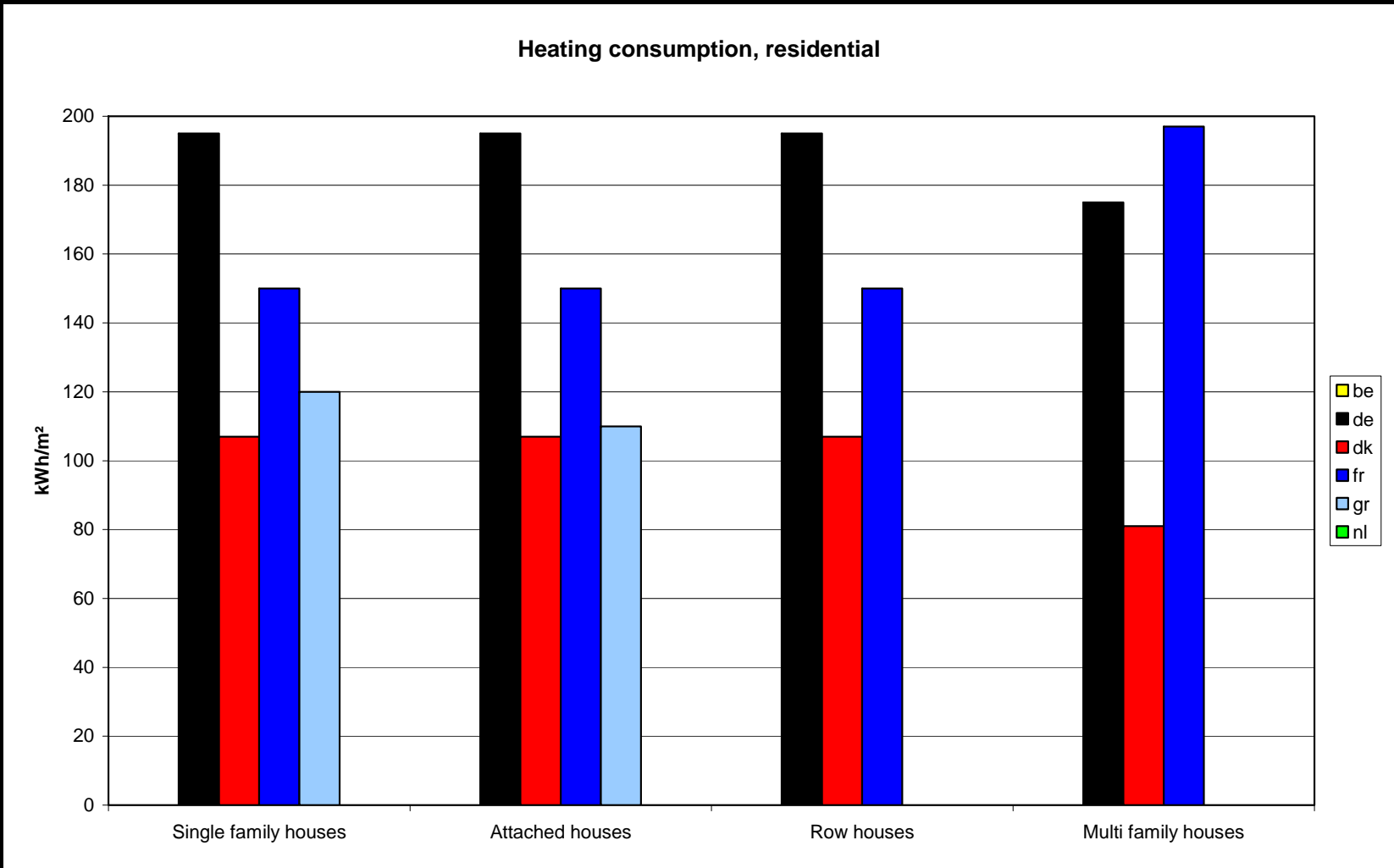
Wall U-values (indicative)
 W/m^2K



EU project ENPER EXIST

- To conduct a survey of the level of information available in the member states regarding the existing building stock to obtain a better knowledge of the potential of energy savings
- To make proposal on how to gain improved knowledge of the existing building stock using certification schemes

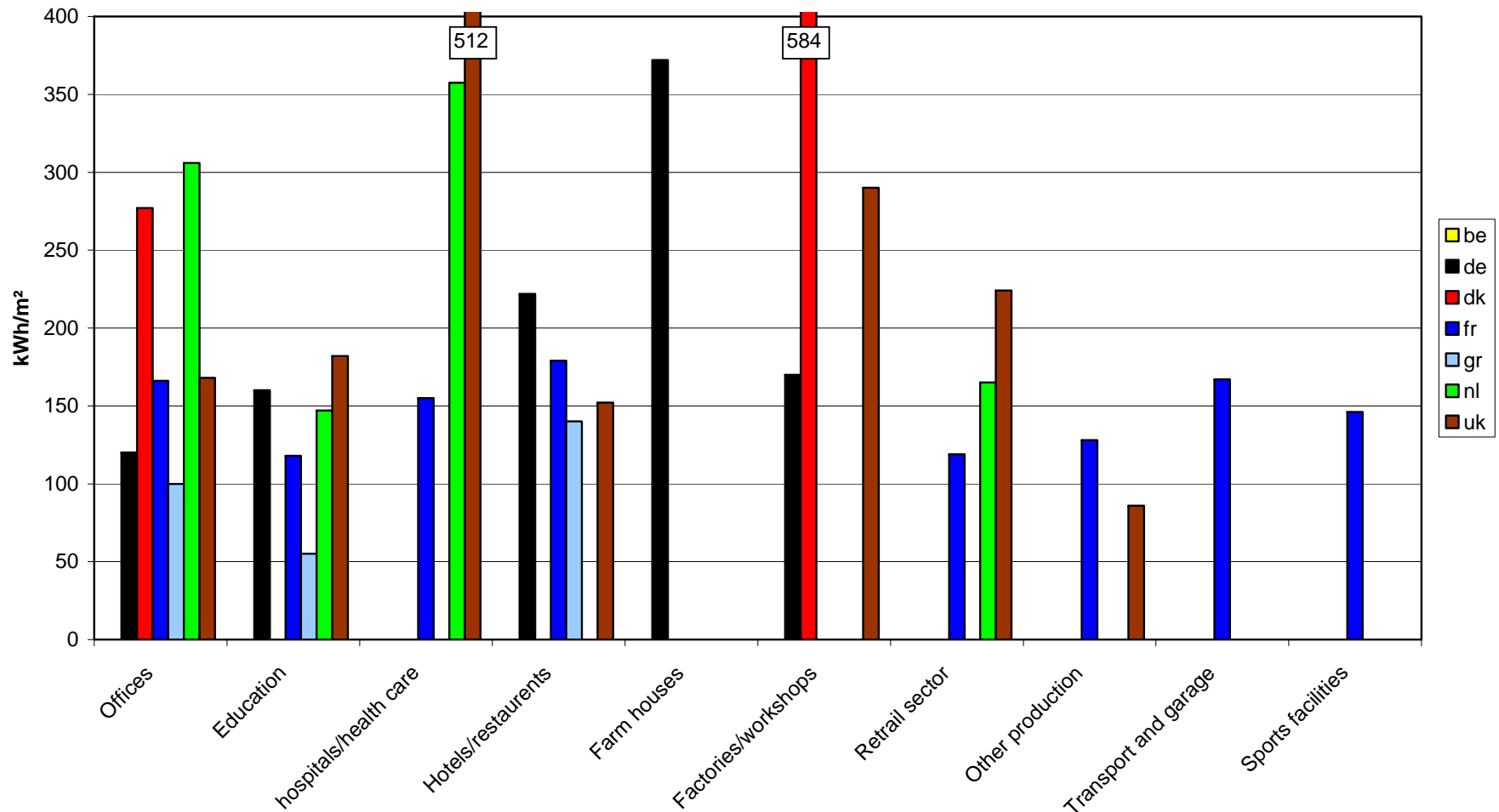
Heating consumption, residential



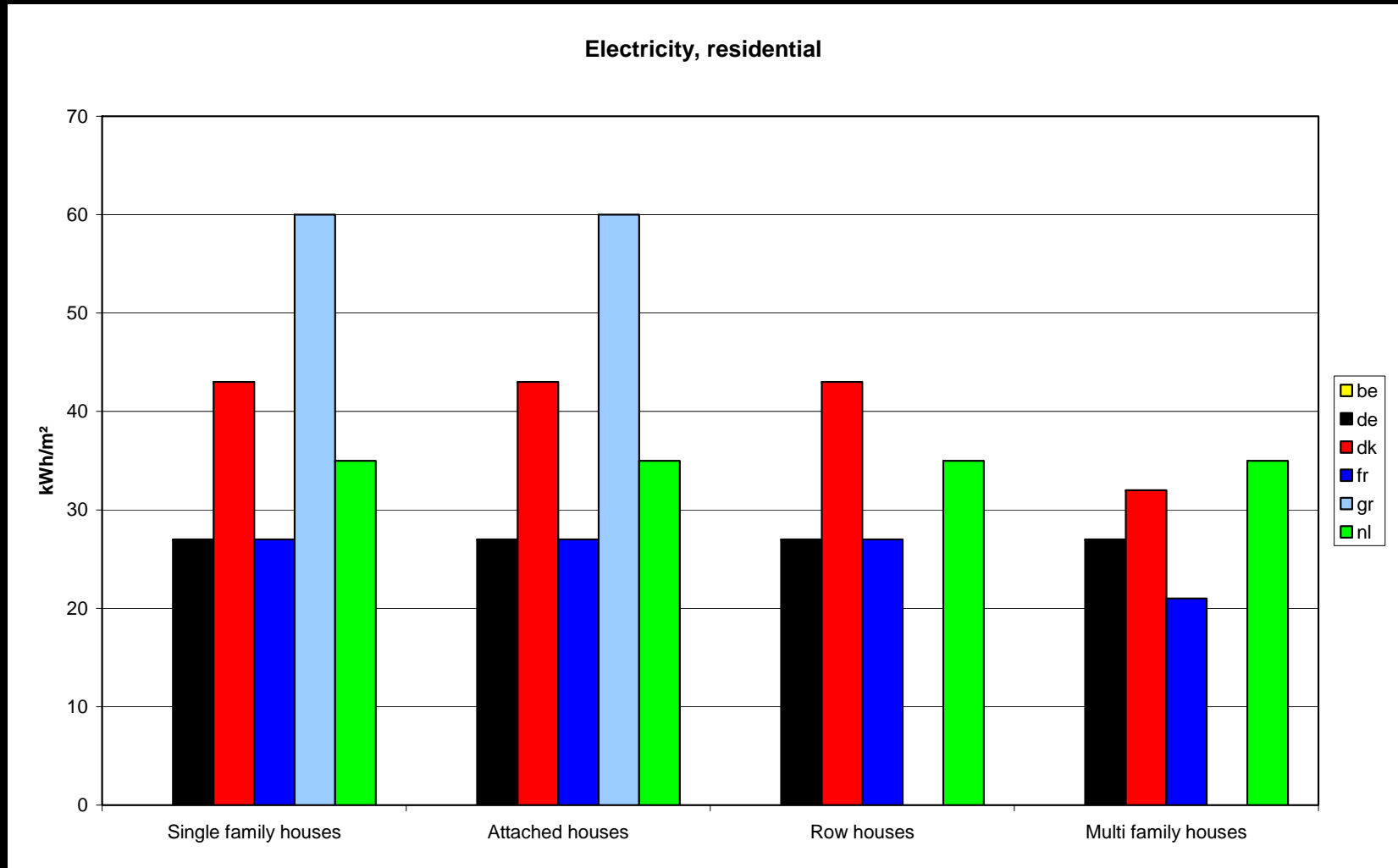
Heating consumption, non-residential



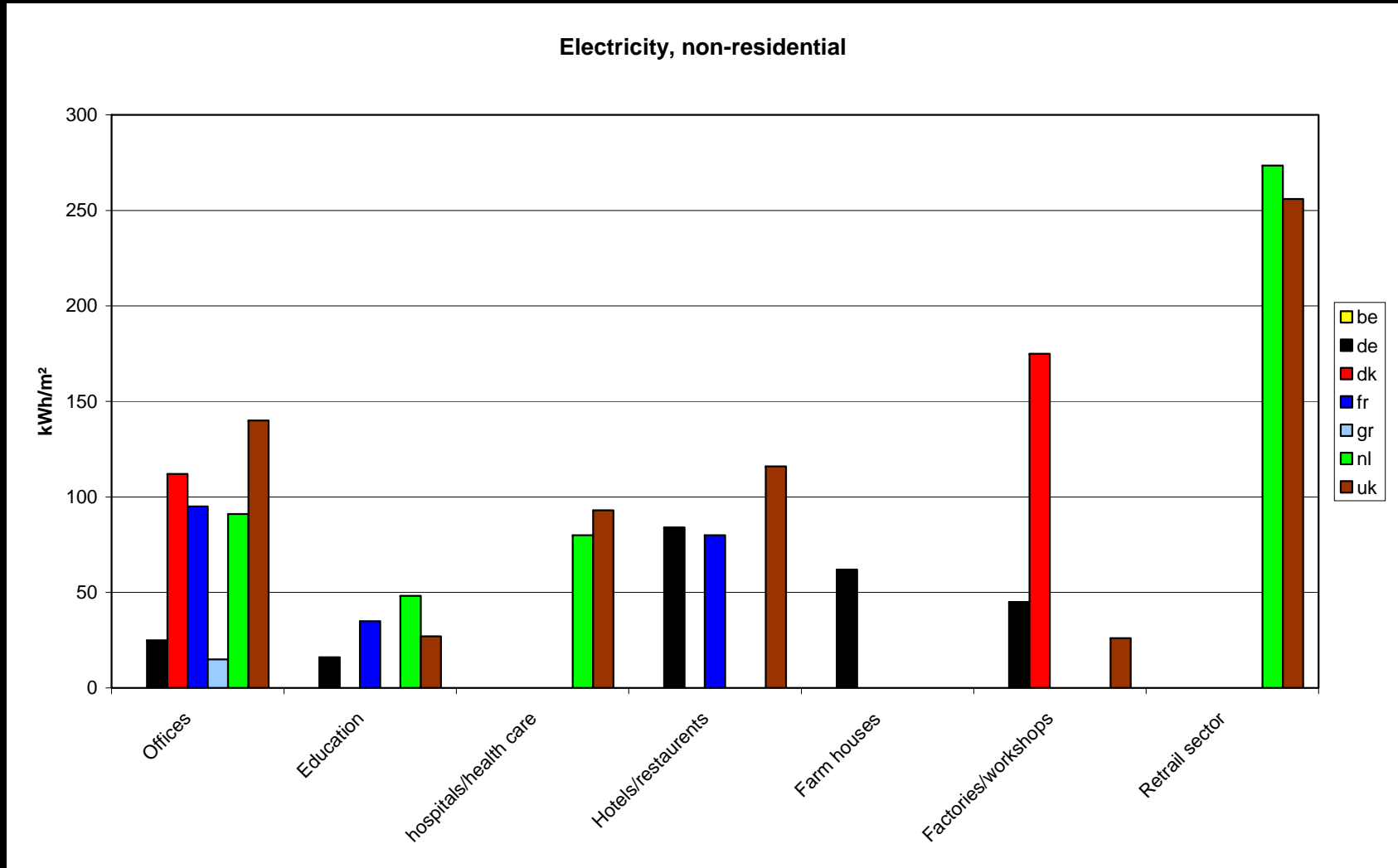
Heating consumption, non-residential



Electricity consumption, residential



Electricity consumption, non-residential



Building knowledge based on the Danish energy certification scheme



The objectives were to find the potential for heating savings for existing Danish dwellings

- Method and calculations
 - Data from BBR register (building stock register)
 - Data from EM-scheme (energy labelling scheme)
- Findings: The potential of energy savings



Grading into seven typical construction periods

Period

- Until 1930
- 1931 – 1950
- 1951 – 1960
- 1961 – 1972
- 1973 – 1978
- 1979 – 1998
- 1999 – 2003

Characteristics

- Dominated by massive brick constructions
- Hollow core masonry walls
- Hollow walls insulated
- BR61
- BR72 and energy crises 1
- BR78 and energy crises 2
- BR95/98



Data sources

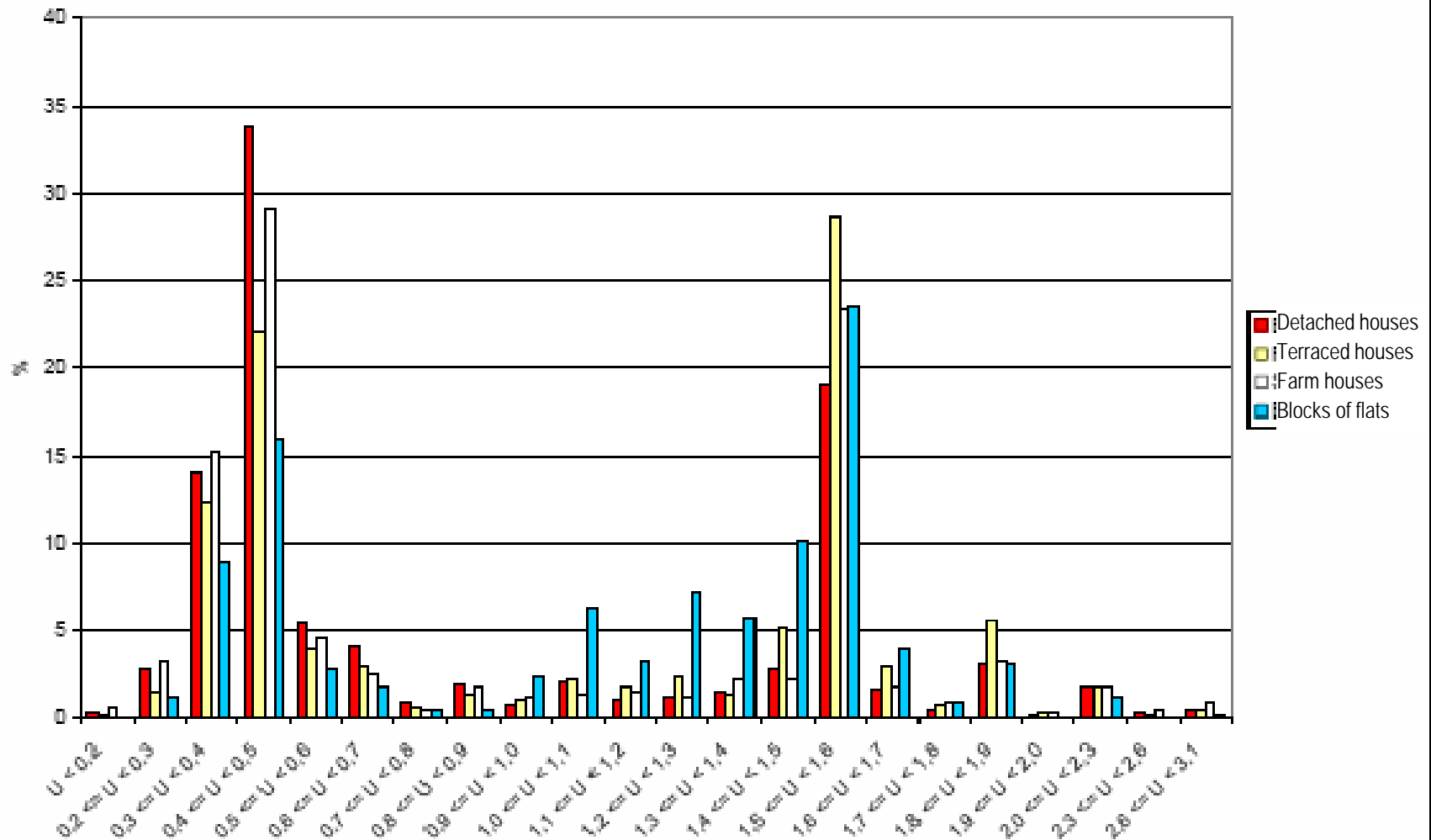
BBR register

- Information about the building stock, the area, the constructions, the sizes and the systems divided in different types of buildings

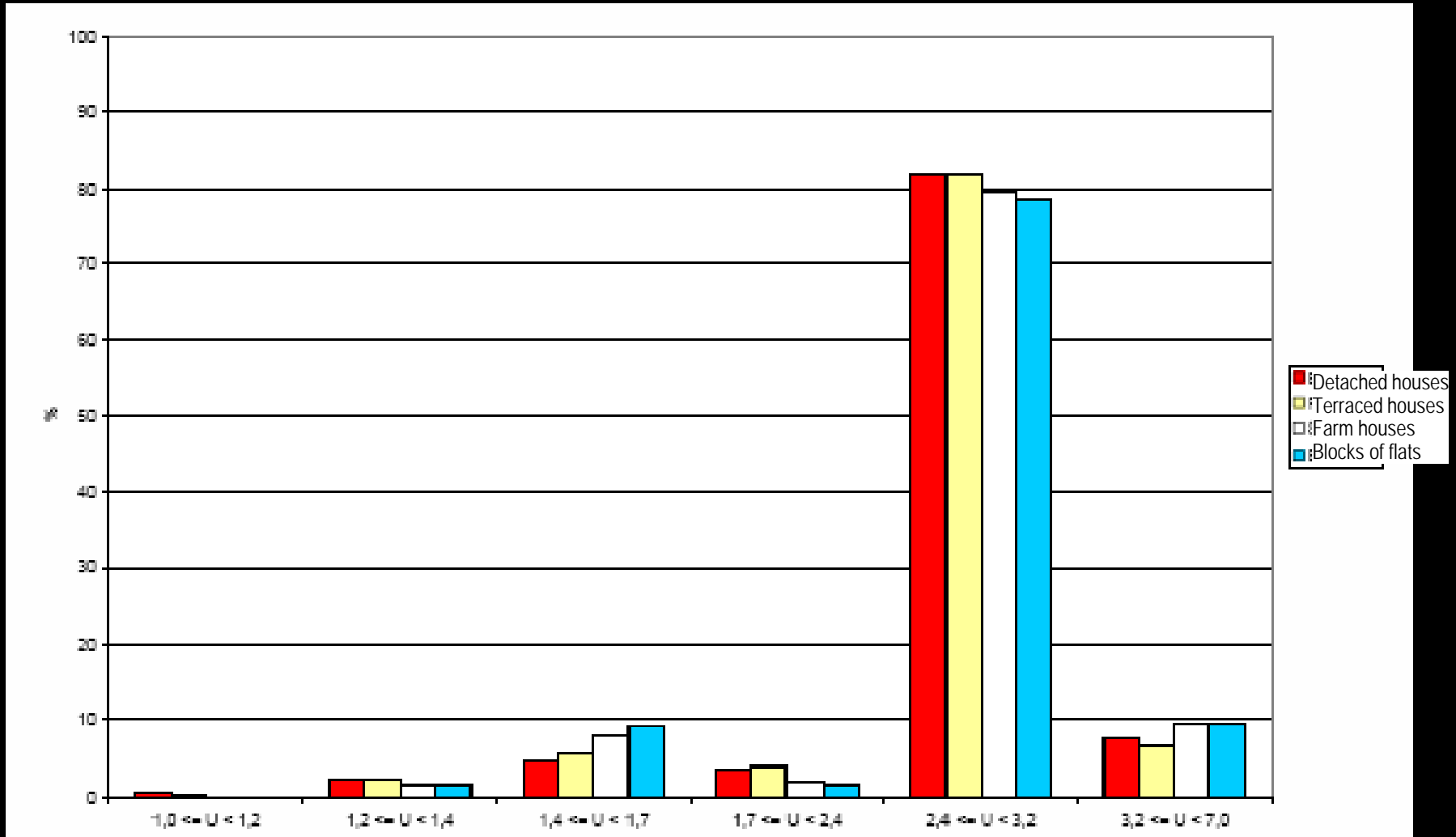
Labelling scheme (EM-scheme)

- Extract from database of approx 200,000 buildings in the period from 1999 to 2003
- Analyses of registred U-values diveded into different constructions and periods

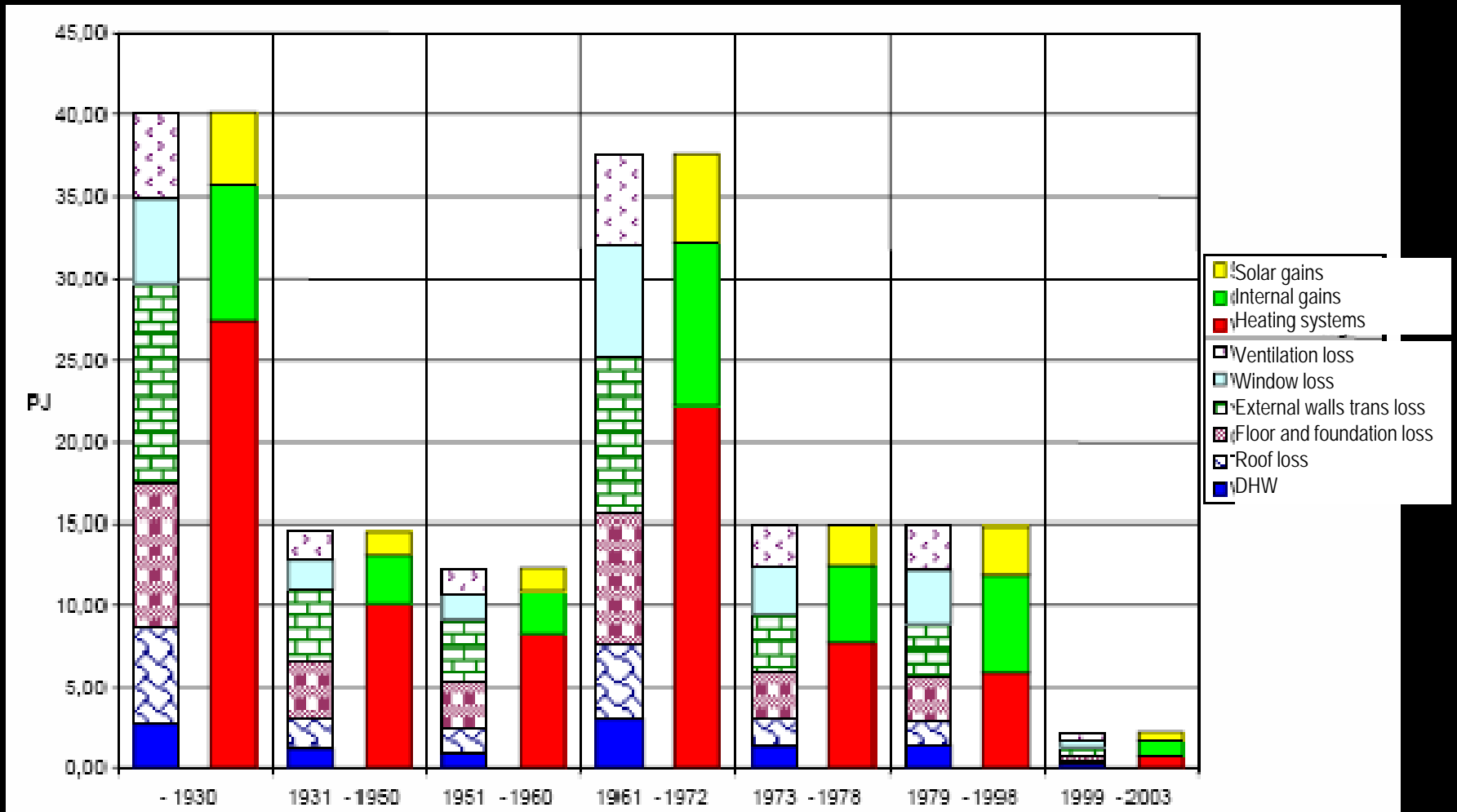
EM: Outer walls, before 1930



EM: Windows 1961-1972



Energy balance for single family houses

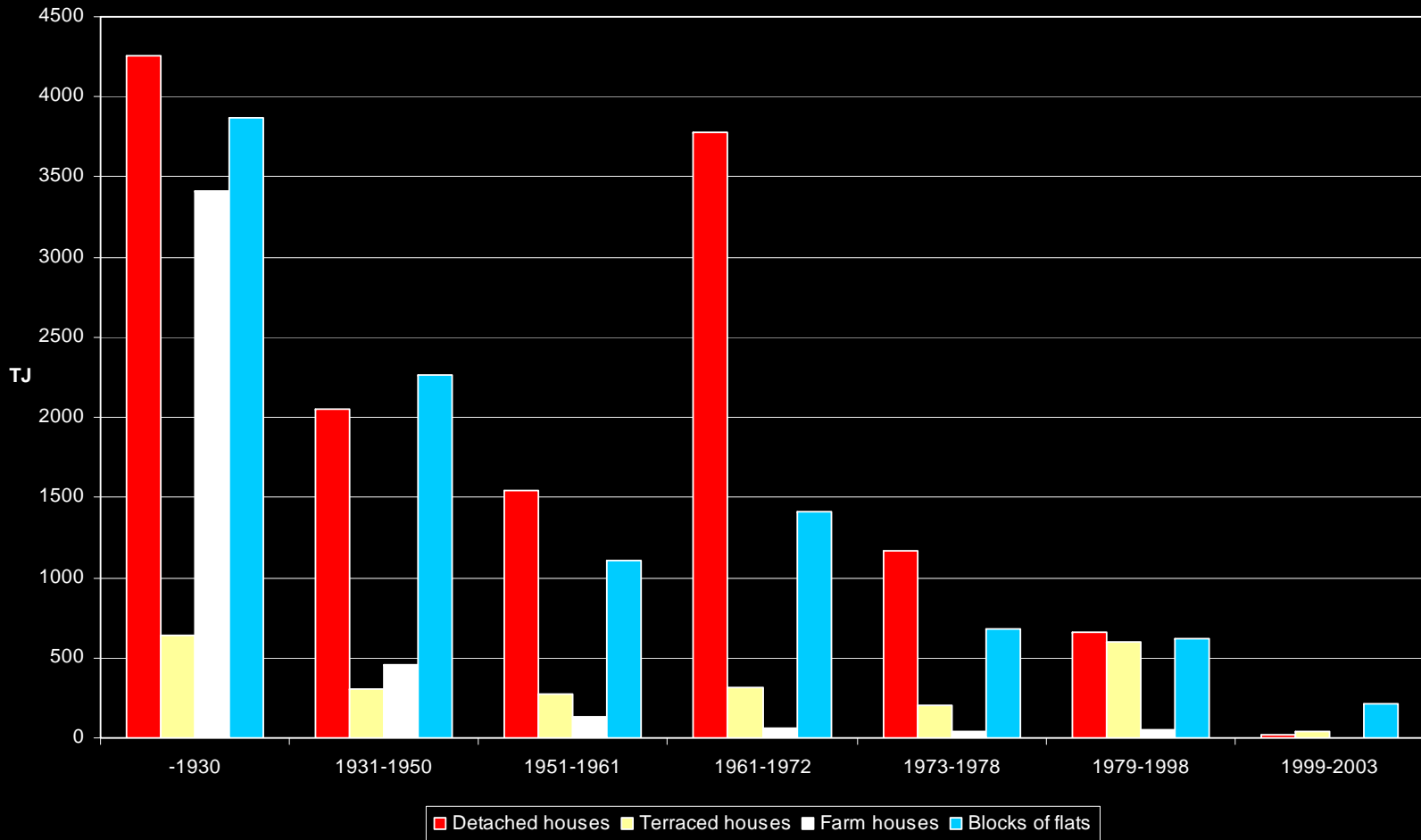




Assumptions

- 50 % of all external walls and floors with U-values at 1.0 W/m²K and above can be improved to a U-value of 0.45 W/m²K
- 50 % of all roofs with U-values of 1.0 W/m²K can be improved to a U-value of 0.35 W/m²K
- All windows can be replaced with windows of today's standard corresponding to an average U-value of 1.6 W/m²K
- All U-values of the improved U-values is the average U-value taking into account thermal bridges

Energy saving potential in TJ





Energy saving potentials

- One-third of heating consumption in dwellings can be saved
- More than 30 PJ ($30 \cdot 10^{15}$ Joule) per year can be saved in DK corresponding to 830 millions litre oil
- It is a conservative estimate, but on the safe side!

The new rules for certification



- ◆ When buildings are constructed, sold or rented out an **energy performance certificate** is to be made available to the prospective buyer or tenant
- ◆ **Public buildings** to set an example by being certified regularly and visibly
- ◆ All large buildings visited regularly by the public to **display energy certificate prominently**





Labelling scale for none-residential

kWh/m² år, A is the heated floor area

- $A < 70 + 1600/A$
- $B < 95 + 2200/A$
- $C < 135 + 3200/A$
- $D < 175 + 4200/A$
- $E < 215 + 5200/A$
- $F < 265 + 6500/A$
- $G > 265 + 6500/A$

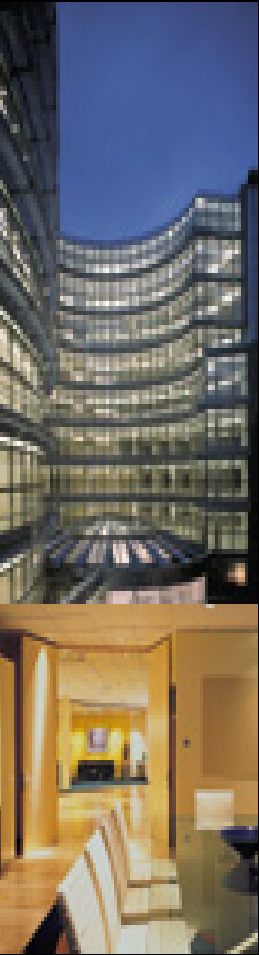
Inspections of boilers and air-conditioning systems



- Many MS have organised an inspection system following one of the two main approaches based on available experience:
 - as a proof of regular maintenance and random on site check
 - as regular inspection performed by, e.g. chimney-sweepers, normally in charge of safety checks
- Other MS have implemented or intend to organize information, promotion and advice campaigns to accelerate the replacement of old boilers or to improve servicing
- There are yet no consensual methods to assess the equivalence of the effects of inspections and information campaigns



Concerted Action - objectives



- To enhance and structure the sharing of information and experiences from national implementation
- To promote good practice concepts in activities required of Member States for implementation of the EPBD
- To create favourable conditions for an accelerated degree of convergence of national procedures
- To complement the work of the Energy Demand Committee (Article 14 of the EPBD) and its ad-hoc group on CEN standards and Certification



Concerted Action 2 - objectives

Work focuses on a series of specific, objective issues arranged in 5 core themes:

- Certification procedures
- Inspection of boilers and air-conditioning systems
- Specifications and training requirements for experts and inspectors
- Methods for procedural aspects for energy performance
- Information campaigns



- Home
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- 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 and Romania.

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

- Setting up mechanisms for the transfer of information between stakeholders;
- Helping to develop and disseminate best practice.



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]

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www.buildingsplatform.eu



Belgian Regions.



www.energiesparen.be/energieprestatie/alldownloads.php#software

Status of the EPBD Implementation in the Flemish Region (Belgium)

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Denmark

Implementation of the EPBD in Denmark: Status August 2006

Denmark has implemented the EPBD since January 1st, 2006. Denmark has for many years had fairly strict energy requirements in the building regulations, obligatory labelling scheme for buildings and obligatory inspection scheme for boilers. Denmark has now tightened the energy requirements in the building regulations further and developed new labelling and inspection schemes.

1 > Legal context

In Denmark the implementation of the Energy Performance Building Directive, EPBD is the responsibility of the Danish Energy Authority (Articles 3, 5, 7, 8, 9 and 10) and of the Danish National Agency of Enterprise and Construction (articles 3, 4, 5 and 6).

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www.buildingsplatform.eu



Implementation of the EPBD in The Netherlands: Status and planning

The Netherlands is very experienced. Due to the existing certification problems issuing an EPBD Energy The Directive is more difficult to building stock (built before 1997) building stock in the Netherlands

1 > Legal context

The implementation of the Energy Performance in the Netherlands falls under the responsibility of the Ministry of Spatial Planning and the Environment.

On November 1st 2005 the Dutch government Commission on the status of the implementation in the Netherlands. The Netherlands fully implement and strives for a full implementation of

The Dutch government aims at completing the Netherlands, from January 1st 2007 accreditation of assessors or inspectors the Energy Performance Certificate. Qualified inspectors, the Energy Performance mandatory for every transaction in the

2 > Status of the implementation

The Netherlands already meets the Di

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Implementation of the EPBD in Portugal: Status and planning

Portugal has adopted a series of measures to implement the directive into the national law: on 4 April 2006, the Government has adopted three Decrees that, together, constitute the transposition of the EPBD into national law.

1 > Legal context

On 4 April 2006, the Official Journal published three Decrees regarding the transposition of the EPBD in national law:

- Decree 78/2006 - It creates and defines the operational rules for the System for Energy and Indoor Air Quality Certification of Buildings

www.buildingsplatform.eu



Goals for amending the EPBD in 2009

- Mandatory targets for minimum energy efficiency requirements in all MS
- Moving limits towards what today is “passive housing” (or A, A+) standard (i.e. at least 50% better than today's minimum requirements)
- Lowering the threshold of applicability of energy requirements in major renovations below 1000 m²
- Imposing mandatory monitoring of results at MS level and common reporting formats to the European Commission



Main gaps of the EPBD

- Building regulations promoting better summer design and prevention of overheating may have a more important potential for producing energy savings than inspections of small air-conditioners, of doubtful cost-effectiveness
- New requirements set up by MS, especially for major renovations, often cause significant difficulties to building owners. Financial support schemes clearly desirable
- Information and awareness campaigns are essential and they should be addressed in a more systematic way
- Monitoring requirements and reporting contents are clearly needed.