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The CENSE project in a nutshell:

The aim of the project IEE-CENSE (October 2007 - March 2010) is to support the EU Member States and other target groups in the awareness and effective use of the European (CEN) standards related to the EPBD.

The use of the CEN standards to support the EPBD in the EU Member States

An overview and some typical examples.

This paper gives a short overview and a few typical examples of the (anticipated) practical use of the set of CEN standards to support the EPBD in national standards and/or national (regional) law or building regulations.

The overview is based on a questionnaire, prepared by ISSO in cooperation with TNO. The questionnaire was circulated in February and March 2008.

1 > Groups of the CEN-EPBD standards

The set of CEN-EPBD standards consists of 43 titles or parts and can be grouped as follows:

1. Two key standards on expressing energy performance and for energy certification of buildings, the overall energy use, primary energy and CO₂ emissions, the assessment of energy use and definition of energy performance ratings.
2. The building physics standards, e.g. describing the calculation of heat transfer by transmission and ventilation, heat load and summer temperature, solar transmittance and the calculation of the energy needs for heating and cooling the building.
3. Standards on the description and properties (classification) of ventilation systems plus cooling and air conditioning systems. Concerning ventilation systems, the standards describe the calculation of the air flow and the energy required for treatment.
4. The third group concerns the description of space heating and domestic hot water systems. This group of standards makes it possible to assess the energy needs of the systems (that is the input to generation systems), starting from the building energy needs. Systems are described as a series of subsystems including emission and control, distribution, optional storage and generation.
5. A series of supporting standards on:
 - ◆ Lighting systems for buildings (including the effect of daylight)
 - ◆ Controls and automation for building services
 - ◆ Classification of the indoor environment
 - ◆ Economic evaluation of sustainable energy applications.
6. A set of standards on inspection:
 - ◆ Boilers and heating systems
 - ◆ Cooling- and AC systems
 - ◆ Ventilation systems.

2 > Status of the CEN standards

Not mandatory in national/regional building regulations

The commission supported the development of the present CEN standard by giving a mandate to CEN to produce the standards needed to support the implementation of the EPBD.

It will be beneficial for Europe if all Member states use these standards as a reference.

However, building regulation is an area where the EU Member States claim their national privilege to formulate the national legislation. The EPBD adopted the subsidiarity principle in this respect.

Unlike e.g. for the CEN standards under the Construction Products Directive (CPD), the use of the CEN standards to support the EPBD in the context of national or regional building regulations is not mandatory.

Due to the differences in climate, user behaviour and market conditions, most of the CEN standards for the EPBD are formulated in such a way that direct practical use, without supporting national information (national annexes), may be difficult.

More information can be found in the Buildings Platform Information Papers on the CEN standards: P02, P40 and P60.

Although most Member States say they use the CEN standards as a basis, as these procedures are in accordance with the EPBD, most of the Member states do not require the direct use of these standards. In the following we present an overview of some practical solutions that have been applied and a few typical examples worked out in more detail.

3 > Practical use in the Member States

Different options in practical implementation

Different practical solutions are possible, for each CEN standard or group of CEN standards.

In some Member States part of the content will be found in national publications or regulations, in some other Member States using the EPBD standards is always an alternative solution.

We will illustrate the main options further on.

4 > Questionnaire

A questionnaire was sent to contact persons in 23 Member States.

20 Member States completed the overview.

Main question

For each group of CEN-EPBD standards we wanted to know if and how the CEN-EPBD standards most likely will be used in the national procedures (not at all, partially or fully) in the near future (e.g. in the next five years) and if the CEN-EPBD standards are likely to be used in the national (regional) laws and building regulations.

Near future

We are mainly interested in the near future situation/application of the CEN-EPBD standards in the EU Member States, because we are primarily interested in the near future needs and in many countries the current situation is not representative of the near future. For instance,

because most of the CEN standards have only recently been published (2007, 2008). Evidently, this required from the respondents an "expert's best guess" on the expected situation in the near future.

Building regulations versus standards

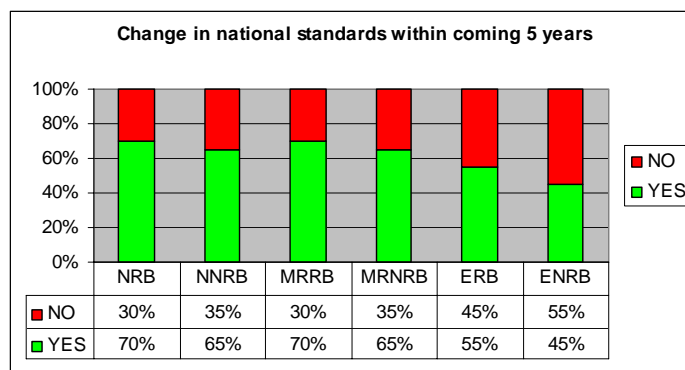
We are mainly interested in the application of the standards in the context of the national or regional building regulations, because we are interested in the use of CEN standards in the context of the implementation of the EPBD.

5 > Are any major changes expected in the Member States within the next five years?

The following two questions were included to get an impression of the expected changes in the Member States in the coming few years.

Question: Do you expect for the energy performance of buildings a significant change in the *national standards* within the coming five years?

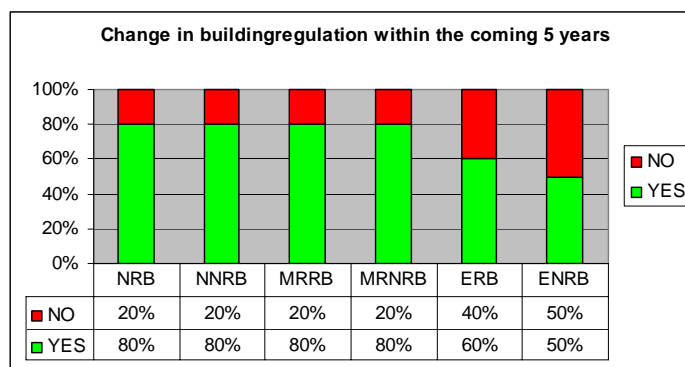
Result:



NRB New residential buildings
 NNRB New non-residential buildings
 MRRB Major renovation residential buildings
 MRNRB Major renovation non-residential buildings
 ERB Existing residential buildings
 ENRB Existing non-residential buildings

Question: Do you expect a significant change in the *national (regional) law and building regulation* of the energy performance of buildings within the coming five years?

Result:



Conclusion

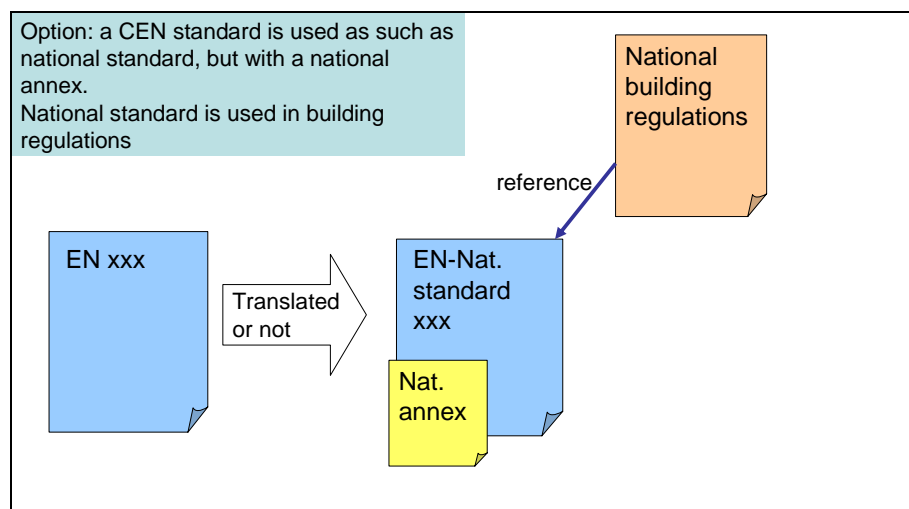
The response confirms that we should indeed try to get information on the near future situation, because in most Member States significant changes are expected within the next few years.

6 > The expected near future use of CEN standards: some examples from a few Member States

A number of questions focused on the use of CEN standards in national standards and in building regulations.

Before we give a brief overview of results, a number of typical examples will help to illustrate the different options.

Option 1: CEN standard, with or without national annex, used in building regulation



This option is the preferred option from the perspective of the CEN rules:

If relevant a national annex contains the relevant national choices, boundary conditions and input data.

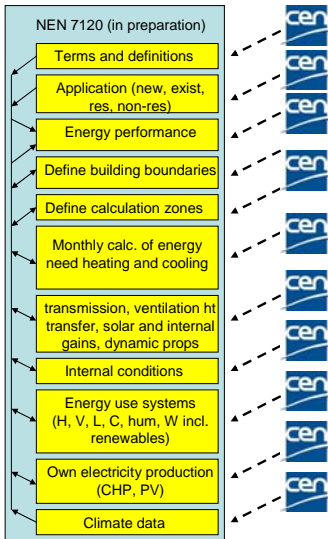
Example:

This option is most commonly used for specific standards to calculate the performance of building and system components.

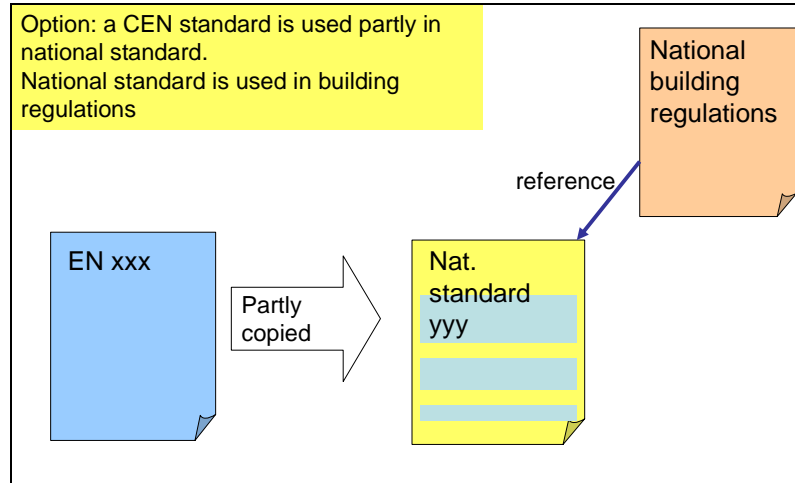
Option 2: National standard used in building regulation

Example option 2:

The Netherlands, draft structure of new NEN 7120 (in preparation) in which parts of the CEN standards are taken into account in one integrated national standard:



In each chapter of NEN 7120 it will be (briefly) explained in which way the relevant CEN standards are taken into account



This option is a practical but temporary way to implement the CEN standards. According to the CEN rules, this is only allowed if the scope of the national standard differs from the scope of the CEN standard. In the case of the CEN standards for the EPBD this can be regarded as a temporary practical solution.

Example: The Netherlands

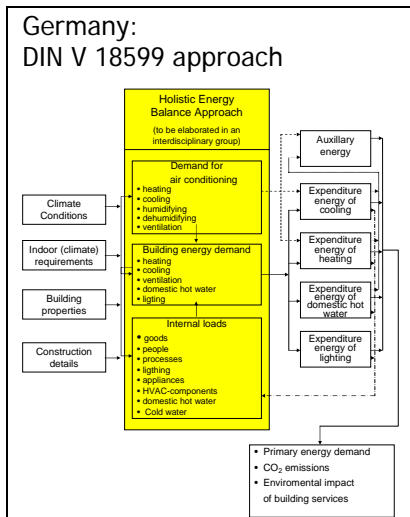
In The Netherlands a new version of the national standard for calculating the energy performance of buildings is in preparation, NEN 7120, integrating and replacing the existing national standards for new residential and non-residential buildings (*NEN 5128 and NEN 2916; in force since 1995 and already based on the same principles as EN 832, EN ISO 13790*), plus the current national documents for the energy label for existing residential and non-residential buildings (ISSO 82, ISSO 75) and at the same time incorporating as much as possible from the CEN standards.

The new national standard will comprise most of the calculation procedures in one standard, starting with the specification of the building boundaries and partitioning of the building in calculation zones and building functions (e.g. office, sports, ..) up until and including the presentation of the final results for delivered and produced energy, conversion to primary energy and conversion to a numerical indicator and EP classes. Only the calculation of thermal transmission properties and (probably) also the calculation of the air infiltration and ventilation is given in separate national standards (NEN 1068, NVN 8088). In turn, NEN 1068 covers the content of most of the EN ISO standards on thermal transmission. NVN 8088 intends to apply the "national statistical option" allowed for in EN 15242.

NEN 7120 will use the common symbols and (English) subscripts that are given in the so called "Umbrella document" (EN TR 15615), the common definitions (translated) from the same document and the general structure from EN 15603 (see chapter 9). This will support further harmonisation in the near future.

Example: Germany

In Germany, a new national standard for calculating the energy performance of buildings was introduced in 2005, the DIN V 18599. It is mandatory in the case of non-residential buildings and will replace the existing national standards for new and existing residential buildings (DIN V 4108-6 and 4701-10), and will incorporate at the same time as much as



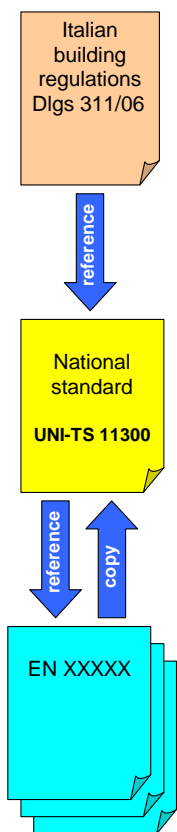
The German Standard is the national general application of selected options from the different EPBD related CEN standards. In the national (DIN) version of the relevant CEN standards a national annex mentions this relation.

Example option 2 - Italy

Italian regulation refers to UNI-TS 11300, which is a general overview of the building energy performance calculation.

In turn, UNI 11300 partially includes (translated, when not yet published) and partially refers to EN standards.

The future prospect is towards referencing EN standards, as long as they are published, in future versions of UNI-TS 11300.



possible from the content of CEN standards.

The national standard includes all the calculation procedures in one standard, starting with the specification of the building boundaries and partitioning of the building in calculation zones and building functions (e.g. office, sports, ..). The efficiency of the building service systems (accounting for the interaction of system behaviour with building use via the holistic calculation approach) is also included. Finally the presentation of the final results for delivered and produced energy is regulated, as well as conversion to primary energy.

DIN V 18599 used as far as possible the common symbols and (English) subscripts that are given in the so called "Umbrella document" (EN TR 15615), as well as the common definitions (translated) from the same document. It also conforms to the general structure of EN 15603. This will support further harmonisation in the near future.

Example: Italy

Implementation of EN standards started in 2003. CTI issued a "Recommendation" (known as "R03/03") which modified the UNI calculation procedure to align it with coming EN standards:

- For the building section, EN 832 and 13790 were already well known and stable, so the recommendation only provided guidance on using these EN standards (example: default calculation hypothesis, where to find climatic data, default U values for old structures, etc.).
- For the heating system section, since there were no published EN standards, some of the draft parts of EN 15316 were translated and copied into the recommendation R03/03.

The revision of the R03/03 was published in May 2008 as UNI-TS 11300 (UNI Technical Specification). UNI TS 11300 gives a complete overview of the energy performance calculation process in a single document and contains:

- A calculation hypothesis (i.e. internal winter/summer internal temperature)
- Reference to EN standards with specification of which method is to be used when alternatives are left open within the EN standard
- Copies of other standards which, at the time of drafting the UNI-TS, were not yet approved and published (example: EN 15316-4-1 about boilers).

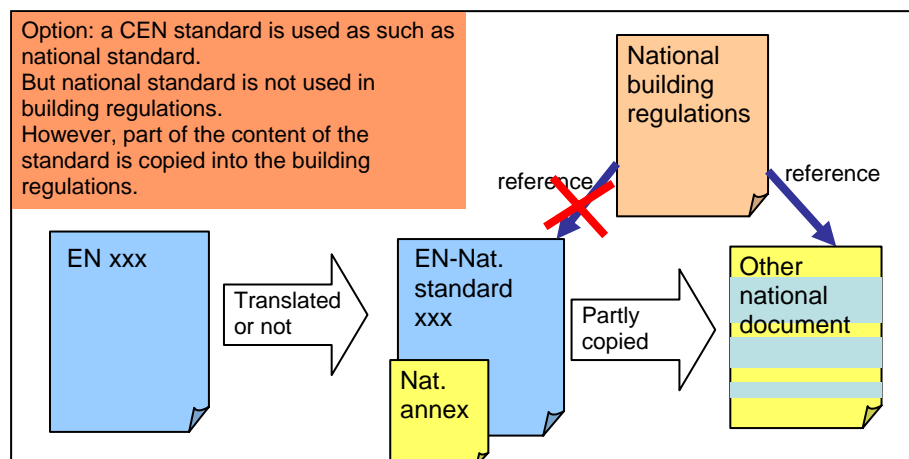
The first two parts of UNI-TS 11300 have been published. Building needs for heating, DHW and cooling, plus most common heating systems and domestic hot water systems are covered. Further parts will be developed about renewables, special generation systems (heat pumps, district heating), cooling systems, mostly by referencing published EN standards.

Copied text from EN standards should be removed and replaced by references to EN standards in further revisions of UNI-TS 11300.

Italian national regulation and most regional regulations require that the energy performance of buildings be calculated according to UNI-TS 11300.

Until now, only one Italian region has imposed its own calculation method, which is entirely specified in the regional law.

Option 3: Building regulations do not refer to national or CEN standards



Note that in this option it is not relevant for the national implementation of the EPBD whether or how the CEN standards are used as national standards.

But it is relevant if and which parts of the CEN standards are used in the national building regulations.

Example: France

In France, new calculation procedures were adopted by the Government in 2006 (decree of the 19th of July 2006 relating to the calculation procedures Th-C-E 2005). There are specific procedures for dwellings and for other buildings. For some parts, the national procedures use some of the content of the CEN standards. The preceding regulation on new buildings (RT2000) was already based on the same principles as (pr)EN ISO 13790.

The Th-C-E 2005 refers for the building components to the Th Bat Rules (insulation, inertia, solar factor), which are explicitly based on the CEN standards.

Even if not directly referring to the CEN standards, the Th-C-E calculation method reproduces the EN ISO 13790 hourly method for heating and cooling needs, summer comfort and ventilation CEN standards.

For system components, in general, reference is already made to the CEN standards.

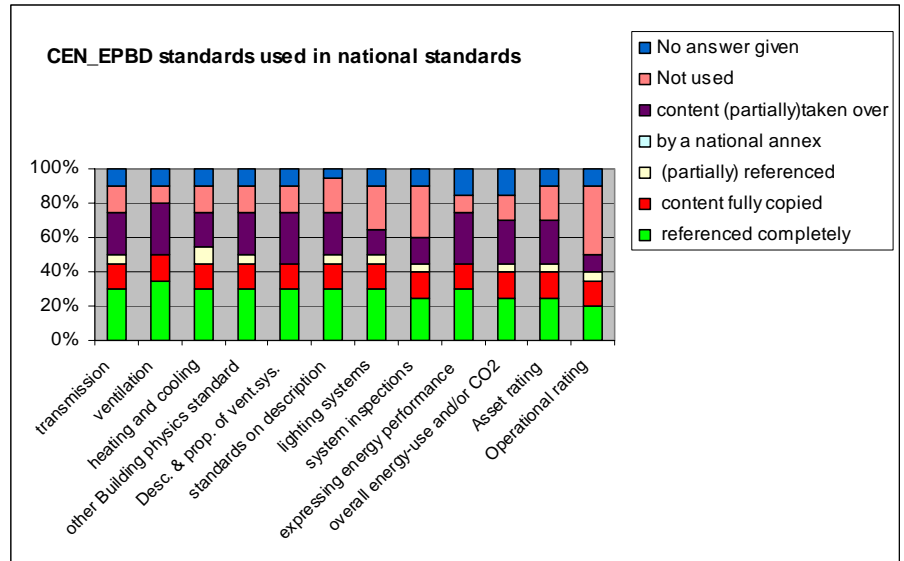
7 > The expected near future use of CEN standards: overview of the Member States

A number of questions concerned the use of CEN standards in national standards and in building regulations. In this chapter, following the examples from a few Member States, we give a brief overview of the findings.

Question 2.1

Are the CEN-EPBD standards used in national standards?

Result:



Explanation

This figure summarises how the Member States expect to use the CEN-EPBD standards in their national standards in the near future. Some of the Member States expect to use the CEN-EPBD standards but they do not refer to these in their law or building regulation, see next question.

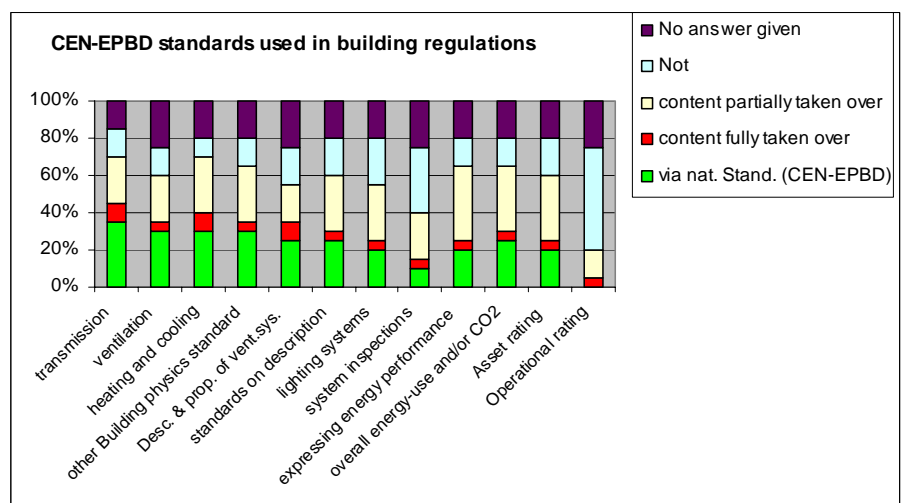
Conclusion

40% of the Member States (intend to) copy fully or reference completely all the CEN-EPBD standards in their national standards. For other Member States it depends on the group of the CEN-EPBD standards how they are used. For most of the groups they either transfer the content partially or refer to parts of it.

Question 2.2

Are the CEN-EPBD standards used in law and building regulations?

Result:



Explanation

This figure summarises how Member States expect to use the CEN-EPBD standards in their laws or national building regulations in the near future. The option "via national standards" means that the content of the national standards is based on the CEN-EPBD standards as mentioned in question 2.1.

Conclusion

Almost 25% of the Member States (intend to) use the national standards (based on CEN-EPBD standards) in their laws or building regulations. Some other Member States transfer the content of the CEN-EPBD either in full or partially in their laws and/or building regulations. Only about 10% of the Member States do not expect to use the CEN-EPBD standards in their laws and/or building regulations.

8 > Some typical remarks by representatives of the Member States

- *"Requirements and guidelines are given in national regulations (National Building Code), not in national standards. The national regulations give (typically general but in certain details also specific) references to existing standards - in practice this means references to European Standards (in some cases to ISO, if available)."*
- *"Traditionally, national regulations apply to new buildings - specific regulations for existing buildings are under discussion."*
- *"There are a number of regions in our country. In principle the national law applies only in the regions that do not have their own regulations."*
- *"First opinion was that the CEN standards are too complicated. The strategy is however to slowly take over all EN standards, but probably only after a revision of the standards."*
- *"I remember that according to the CEN rules CEN standards shall replace national standards. Therefore all CEN standards should be used in national standards."*
- *"There is no standardization activity going on in our country in the building field. The committees are focusing on adapting CEN or ISO standards as national standards by different means: translating the whole standard or the first page of it. Therefore, I assume that within five years most of the standards that are necessary will be adopted in such a way, and afterwards referenced into regulation. The regulation will allow different kind of simplifications, but only where they are envisaged by the standards."*
- *"According to CEN rules, CEN standards will replace national standards. Therefore all CEN standards will be used as national standards. But they are **not mandatory** and therefore the national buildings regulations are mainly based on national experimentally validated rules."*
- *"The responsible body for implementation of the building related CEN standards has - after some bad experience with a certain CEN standard (not CEN-EPBD) - decided in the case of energy and building to generally implement the content of CEN standards in the frame of own national standards (no contradictions, but not 1:1 implementing of CEN standards)."*
- *"When the building regulation was revised, the standards were not available as EN standards (the final version was not available). In our*

country the calculation method is orientated towards hourly methods. Many standards do not have hourly methods."

9 > Preliminary conclusions and next steps

The aim of the project IEE-CENSE is to accelerate the adoption and improved effectiveness of EPBD related building energy performance standards in EU Member States.

The main activities are:

- > To widely communicate the role, status and content of these standards and to provide guidance on their implementation.
- > To collect comments and good practice examples from Member States with the goal of removing barriers and to collect and secure results from relevant SAVE and FP6 projects.
- > To prepare recommendations to CEN.

The inventory and examples presented in this paper emphasise the need for such activities.

Some preliminary conclusions from this first general overview:

National laws and/or building regulations should preferably refer to CEN standards, with national annexes for national choices, conditions and input data. CEN rules state that after a transition period conflicting standards from national member bodies (AFNOR, DIN, NEN and others) will have to be withdrawn. However, instead of national annexes many Member States intend to copy into or refer to parts of the CEN standards in national standards or in their laws and/or building regulations. One of the next steps in CENSE will be to investigate, for each group of CEN-EPBD standards, what are the barriers to their adoption in national annexes. This could lead to the development of guidance documents on this aspect and/or to recommendations for improvement of the CEN standards.

It is clear that most Member States are very willing to take the CEN standards into account in one way or another, but perhaps not yet and perhaps not all at once.

Next steps

In a separate Information Paper we will therefore explain why a good starting point could be the use of the top level CEN standards which provide a general structure that could then gradually be augmented at national level with the appropriate (other) CEN-EPBD standards. In that paper we will also pay attention to rules and examples of national annexes (see Options 1 and 3 in chapter 6) and on related activities, in Europe (Ecolabel) and outside (ISO, ASHRAE, ..).

CENSE partners:

TNO (NL; coordinator), CSTB (FR), ISSO (NL), DTU (DK), Fraunhofer (DE), ESD (GB), FAMBSI (FI), EDC (IT)

Associated partners:

HTA Luzern (CH), BRE (GB), Viessmann (DE), Roulet (CH), JRC IES (EC)

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