

PROJECT DOCUMENT

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CENSE Webinar, March 31, 2010

***Towards a 2nd generation of energy performance
calculation procedures in Europe***

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IEE-CENSE

***Leading the CEN Standards on Energy performance of buildings to practice
Towards effective support of the EPBD implementation and acceleration
in the EU Member States***

Supported by

Intelligent Energy  **Europe**

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NOTE: The presentations under Annex B are provided as separate pdf files from the CENSE website (www.iee-cense.eu)

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Moreover, since this is an interim report: the results are only preliminary and may change in the course of the project based on further feedback from the contributors, additional collected information and/or increased insight.

Acknowledgement:

With thanks to BBRI (B) (<http://www.bbri.be>) for their technical support that made this web event possible.

1 Executive summary

1.1 The aim of the seminar

A special Webinar was organised under the title ***“Towards a 2nd generation of energy performance calculation procedures in Europe (and subtitle) to increase the accessibility and efficiency of the energy performance calculation procedures in Europe”***.

The CENSE project has just been completed and at this webseminar the main results of the project are presented, in particular the packages with information on the set of CEN standards to support the EPBD and a series of recommendations regarding a second generation of these standards. This should also be seen in relation to the recently decided revision (Recast) of the EPBD.

The CENSE partners presented a series of recommendations regarding a second generation of the CEN standards to support the EPBD. These recommendations are based upon extensive feed back on the experiences with the national/regional implementation and the use of the current set of CEN-EPBD standards. The current CEN standards are used in many EU Member States, but often in a "practical way". E.g. by copying parts of CEN standards into national standards or building codes, mixed with national/regional choices and input data. A more direct use would be much more efficient and transparent. But at the same time room is needed for national/regional choices. The recommendations include ways to meet both requirements. The EPBD-Recast calls for a wider spectrum of application, which is also reflected in these recommendations.

This Webinar focused especially on members of the EPBD Concerted Action but also other involved groups like policy makers, consultants, building products and HVAC manufacturers, those responsible for writing building codes and educators were welcome.

1.2 The CENSE project

The objective of the IEE CENSE project (2007-2010) is to accelerate the adoption and improved effectiveness of EPBD related building energy performance standards from CEN in the EU Member States.

The IEE CENSE project initiates a number of international/regional workshops:

- to present their work plan and the interim results on information on the CEN standards
- to get feedback from the Member States or other target groups on possible obstacles to use of the standards and on good practice examples
- to identify together the ways for an increased convergence

1.3 The main topics of the seminar

The main topics of this seminar were:

- Experiences with the current set of CEN-EPBD standards and need for second generation
- Set of recommendations for second generation of CEN standards on energy performance
- Examples related to building performance (lighting, heating, ventilation and cooling).

1.4 Conclusions and recommendations

The webinar was well received by the participants. More than 70 persons have participated to the webinar. The overall content and quality of the workshop was assessed as good to very good.

The main final conclusions that could be derived from the webinar are:

- The production of a 2nd generation of CEN EPBD standards is very urgent needed. The update of these standards will have big advantages like more usable for the member states, easier to exchange knowledge, stimulation of circulation of products, faster implementation of new solutions, increasing credibility of EU in the words and make them ready for the Recast of the EPBD
- Start now with the upgrade of the CEN standards because now it's the momentum: for the EPBD Recast as well as the start of the development of the ISO standards for building energy performance. This gives Europe a leading role in the global arena!
- A number of general recommendation for the second generation of the EPBD-CEN standards have been prepared by the CENSE project (see chapter 6), as well as technical recommendations reported in dedicated CENSE reports.

2 The CENSE project

The aim of the CENSE project (2007-2010) is to support the EU Member States (MS) and other target groups in achieving better awareness and more effective use of the European (CEN) standards that are related to the EPBD.

The main activities in the project are:

- 1) to communicate the role, status and content of these standards as widely as possible, and to provide guidance on their implementation;
- 2) to collect comments and examples of good practice from the MS, so as to remove obstacles to implementation, and to collect and secure results from relevant SAVE and FP6 projects;
- 3) to prepare recommendations to CEN.

As part of the second type of activities, the IEE CENSE project initiates a number of international/regional workshops.

More information on the project can be found at the project website (www.iee-cense.eu).

3 Aim and programme of the workshop

3.1 Aim of the workshop

A special Webinar was organised under the title ***“Towards a 2nd generation of energy performance calculation procedures in Europe (and subtitle) to increase the accessibility and efficiency of the energy performance calculation procedures in Europe”***.

The CENSE project has just been completed and at this webseminar the main results of the project are presented, in particular the packages with information on the set of CEN standards to support the EPBD and a series of recommendations regarding a second generation of these standards. This should also be seen in relation to the recently decided revision (Recast) of the EPBD.

The CENSE partners presented a series of recommendations regarding a second generation of the CEN standards to support the EPBD. These recommendations are based upon extensive feed back on the experiences with the national/regional implementation and the use of the current set of CEN-EPBD standards. The current CEN standards are used in many EU Member States, but often in a "practical way". E.g. by copying parts of CEN standards into national standards or building codes, mixed with national/regional choices and input data. A more direct use would be much more efficient and transparent. But at the same time room is needed for national/regional choices. The recommendations include ways to meet both requirements. The EPBD-Recast calls for a wider spectrum of application, which is also reflected in these recommendations.

This Webinar focused especially on members of the EPBD Concerted Action but also other involved groups like policy makers, consultants, building products and HVAC manufacturers, those responsible for writing building codes and educators were welcome.

3.2 Programme of the workshop

Here the Webinar programme in detail:

1. Welcome and Introduction by Mr Dick van Dijk and Mr Berrie van Kampen, TNO (NL)
2. Experiences with the current set of CEN-EPBD standards. The need for a second generation, by Mr. Jaap Hogeling, ISSO (NL)
3. Set of recommendations for second generation of CEN standards on energy performance, by Mr Dick van Dijk, TNO (NL)
4. Examples related to building energy performance including lighting, by Mr Hans Erhorn, FhG-IBP (D)
5. Examples related to heating, ventilation and cooling systems, by Mr Johann Zirngibl and Mr Hicham Lahmidi, CSTB (Fr)
6. Questions, moderated by Mr Jaap Hogeling, ISSO (NL)

The full programme is given in **annex A**.

4 Content of the workshop

4.1 Presentations

Short summary of the presentations (See also **annex B**: copy of the presentations):

Welcome and introduction (by Dick van Dijk and Berrie van Kampen)

Presentation 1: The chairman and co-chair welcomed the participants (see **annex C** for attendance list and **annex D** for the results of the enquiry). The PowerPoint presentations are separately available on the CENSE website (www.iee-cense.eu) as mentioned in **annex B** to this report. A public version of this report will also be made publicly available on the CENSE website.

Presentation 2: Experiences with the current set of CEN-EPBD standards. The need for a second generation, by Mr. Jaap Hogeling, ISSO (NL)

Jaap Hogeling gave a description of the process to develop the more than 30 CEN-EPBD standards and explained the pyramid structure based upon. Most CEN standards are used in many Member States, but in a 'practical way', by copying and/or completing parts of the CEN standards into national standards or building codes. In the practice is noted that the consistency of the CEN standards is not ideal. Besides, there is a need for a separation between common procedures and national/regional choices and input data and a limitation of or better control on the available options. Mr. Hogeling stipulated that the production of a 2nd generation of CEN EPBD standards is very urgently needed. The update of these standards will make them more usable for the EU Member States, which will have big advantages, such as easier knowledge exchange, stimulation of circulation of products, faster implementation of new solutions, increasing credibility of EU in the world and offering procedures that are ready for the Recast of the EPBD.

Presentation 3: Set of recommendations for second generation of CEN standards on energy performance, by Mr Dick van Dijk, TNO (NL)

Dick van Dijk focused on the recommendations to the CEN EPBD standards as result of the feedback from the experts and specialists how are using the standards and implemented energy performance calculation procedures at national level.

- Recommendation 1: Make a clear separation and balance between common procedures and national/regional elements by introducing a National Annex to the standards with the national choices, boundary conditions and input data.
- Recommendation 2: Make the standards software proof and unambiguous by fully spelling out all equations (100% I/O consistent), adding a spreadsheet for validation and software calibration and for more uniformity in interpretation
- Recommendation 3: Shape all standards in a common format, use common term, definitions and symbols, include overview of I/O variables, flow charts and worked examples
- Recommendation 4: Make the CEN standards EPBD-Recast ready (for nearly zero energy buildings, alternative systems, inspection and component requirements, comparative methodology for cost-optimum calculations etc.)
- Recommendation 5: Create more harmony in the level of detail and reconcile differences (to avoid large discrepancies between simplified and detailed procedures), taking into account needs from the Member States
- Recommendation 6: Various technical improvements will be recommended, to be published in separate CENSE reports
- Recommendation 7: Start now with the upgrade of the CEN standards because (1) now it's the momentum: for the EPBD Recast and (2) the start of the development of a set of ISO standards for building energy performance provides a unique opportunity for Europe to retain the leading role in the global arena.

Presentation 4: Examples related to building energy performance including lighting, by Mr Hans Erhorn, FhG-IBP (D)

Hans Erhorn presented the main issues of building energy performance like heating and cooling needs, heat transmission and lighting. He recommends to integrate also innovative developments into standards like double skin facades, switchable glazing etc. He explained EN 15193 concerning lighting in a flow chart giving alternative routes for assessing the lighting energy requirements. He recommended for the 2nd generation of this lighting standard to review the structure and to edit the equations and to work out technical extensions of the standard methodology such as a simplified method for the installed power of new buildings, energy impact of sun shading systems and daylight-responsive control systems, all in close cooperation with the industry. Also 'old fashion' aspects such as night-time ventilation should not be neglected.

Presentation 5: Examples related to heating, ventilation and cooling systems, by Mr Johann Zirngibl and Mr Hicham Lahmidi, CSTB (Fr)

Johann Zirngibl focused on the energy performance of the HVAC systems. He emphasised the importance of the holistic approach of the CEN standards and the performance indicators for HVAC systems. Also more attention should be paid to the inspection of the installations. There is a strong need for highly qualified software proof tools and evaluation methods. In the roadmap towards low energy houses every detail and interaction between HVAC systems and the building envelope is important. Also the indoor air quality and comfort should be included in the revision of the HVAC

standards, especially in low energy buildings. There is an urgent need to develop harmonized European standards and to create the application field for the European methods.

4.2 Profile of participants

This Webinar focused especially on members of the Concerted Action Group but also others involved groups like policy makers, consultants, building products and HVAC manufacturers, those responsible for writing building codes and educators have participated (in totally more than 70 persons).

See also **Annex C**: List of participants and **Annex D**: Summary of the evaluation by the participants.

5 Questions and answers

After the presentation opportunity was given to raise questions (electronically submitted to the web seminar facilitator during the event and moderated by Jaap Hogeling).

Following is a record of the questions and answers:

Question 1: Do you expect some help or requirements from Member States for redevelopment of the CEN standards? Which type of cooperation between CEN and the Member States (MS) do you think could be possible?

Answer by Jaap Hogeling and Dick van Dijk:

Jaap: We could create a CEN-EC-MS consultation group to discuss and agree on the set of requirements to satisfy the need of the MS, with the aim to maximize the possibility for the MS to make direct reference to this future 2nd generation set of CEN-EPBD standards in their national/regional building codes, to overcome all the shortcomings we have reported also this afternoon and to make all the improvements we proposed also really work.

Dick: And if you ask why did this not yet occur during the preparation of the 1st generation of CEN-EPBD standards (the first mandate from EC to CEN, issued mid 2004), I can add from experience, that during the first mandate there was an extreme problem of timing; I am sure that if, at that time, we had first started with preparing and discussing the basic principles for the set of standards to support the EPBD, before starting the writing of the actual standards, then after two or three years time we would have reached agreement on the basic principles, but then we would have had no calculation procedure whatsoever. Now we are in a much better position, because (1) the MS now have much more experience with integrated energy performance requirements and certificates in the building codes than in 2004-2006 and (2) we now have a basic set of CEN standards which makes it much easier to discuss nationally and at European level to what extent this set fulfills the needs or not.

Question 2: How can the process of making the CEN standards be improved: in terms of transparency and involvement of key actors; for instance the actors in the MS who are active in implementing the methodology at national level.

Answer by Dick van Dijk and Jaap Hogeling:

Dick: What we proposed today when presenting the recommendations from the CENSE project, things like making a clear separation between the common procedures and the choices to make and input data to provide at national level, I hope that that will trigger more interest from the national level, because in that situation it is much easier to understand what will be done at European level and what is needed at national level and also to participate actively in making these kind of decisions, but of course, we like to hear also other suggestions of this kind, so if there are suggestions from the audience, please don't hesitate to send us an email to help us in shaping an optimal cooperation.

Jaap: One of the problems in the past was that the structure in CEN, where we discussed the documents, although we were very open in sending the (draft) documents out to everybody who was interested, was organized in such a way that people around the table were not always the same

people as the people who were involved in the national process. But now we can and should learn from this experience and beforehand we could and should discuss who to structure a better platform of exchange of information and experience to overcome that problem during the second mandate.

Question 3: The mentioned "validation" of calculation methods is about "validating" alternative calculation methodologies based on EN methods, but what about real, experimental validation? After many years of developing and using methods like the ones included in EN ISO 13790 (e.g. steady state energy balance with the most controversial gains/losses utilisation factors), have these methods been proved as valid by any controlled experimental work (real full size experiment)? If not, shouldn't be mandatory to check the validity of such methods before carrying on with them?

Answer by Dick van Dijk: Focusing on the monthly method in EN ISO 13790 (calculation of energy needs for heating and cooling): the gain utilization factor approach for heating was validated several years ago in outdoor test cells of the European PASSYS/PASLINK projects. But more in general the problem of validation is that if you use a full-size occupied building, you have so many (uncontrolled) parameters that you need to monitor that the noise which you get from the measurements is much bigger than the outcome that you are trying to validate. So what you do in most cases and what we did now with the new monthly calculation method for heating and cooling needs in EN ISO 13790 is to validate this method against validated detailed building simulation tools.

Jaap: Another issue regarding "validation" in general: When you mention the term "validated" we also use this term in the presentations today in another context: one of the main recommendations from the CENSE project is that if you write a standard, and in that standard you describe a calculation procedure, you have as a standard writer (more precise: as Standardization Committee responsible for this standard), to validate it in the sense that you must be sure that all the equations and procedures you describe are unambiguous and really work. One of the ways to do that is to add to the standard an Excel sheet in which you can show that the procedures really work as they are written down.

Question 4: How can be ensured, that if a CEN-EPBD standard is or becomes an EN-ISO Standard, that it will refer to EN Product Standards and not to ISO Product Standards?

Answer by Dick van Dijk: We have already a precedent, for EN ISO 13790 a normative Annex A has been developed which contains a list of all the references to other standards; this list contains two columns, one with references to CEN standards (for use within the "CEN area", the other with references to ISO standards or (if absent) open to national standards (for use outside the CEN area). One of the general recommendations from the CENSE project is to introduce such an annex in all EN ISO standards. But of course, as more standards will become combined EN ISO standards, the less differences will remain between the two columns.

Question 5: What is the link between Energy Labelling for Heating systems (EuP) and the 2nd generation of CEN-EPBD standards or more in general: with CEN standards? Is CENSE directly involved in the EuP developments?

Answer by Johann Zirngibl and Jorma Railio:

Johann: This is a very interesting question. Today this link still has to be established, it is not there yet. CENSE was of course not directly involved in the EuP development project, but some people who are working in CENSE are also working for the EuP. But I fully agree that something should be done to establish such link, perhaps initiated on a higher level in the European Commission, because it is a very very important issue for the HVAC systems.

Jorma: Johann made a very good point, there are big gaps and his presentation gave a good way to fill the gaps between product data and EPBD calculations. This should be taken up in the relevant CEN Technical Committees; from my experience, it should be well possible in CEN/TC 156 (Ventilation for buildings).

Question 6: In case specific errors are detected in one of the CEN standards. Is there a place established somewhere to announce these?

Answer by Jaap Hogeling: CEN has a procedure: If somebody reports an error, the CEN Technical Committee who is responsible for the standard has to look into it and produce and publish a correction sheet to the standard. This correction sheet should then be adopted and made available by the National Standardization Bodies. Of course we need the feed back from the active users of the standards.

If it concerns a bigger problem with the standard, then it will be an issue for the periodic revision of the standard (the maintenance schedule).

Question 7: Wouldn't it be interesting to agree in a format for exchanging data of HVAC-equipment/building materials? (data of design and operational behaviour)

Answer by Johann Zirngibl: This is a very nice idea; there are already some initiatives going on along these lines with respect to the building component and HVAC component descriptions. The idea is to have one common description and then connect it to several calculation methods. Especially for the HVAC equipment we have an initiative from Germany: Germany has an interesting standard, VDI 3805, about a database giving the description of the HVAC equipment performance, for example all the information you need for a boiler or a heat pump, and also other things like the geometric data or even the design for the systems. And for example in one of my slides I showed the outcome of the design coming from this database.

So, there is something ongoing and we have something practical already which is this German initiative VDI 3805 and it is now put also on the ISO level.

The answers to the next two questions were prepared in writing after the event and communicated directly with the person who raised the questions.

Question 8: Wouldn't it be interesting to agree in CEN in a minimum level of modellisation?.

Example

(http://www.mityc.es/energia/desarrollo/EficienciaEnergetica/CertificacionEnergetica/DocumentosReconocidos/OtrosDocumentos/Proced_%20simplificado.pdf)

Answer by Dick van Dijk: The example in the hyperlink looks interesting, but difficult to interpret without translation in English and without context.

Generally speaking it would indeed be interesting to agree on a framework with principles and conditions that is more detailed than the framework for the calculation methodology given in the EPBD & its recast. This is in line with the recommendation from CENSE to work out a set of basic common principles for the calculation procedures and to create a modular structure including the identification of the constituting elements, incl. timesteps etc. and to work this out digitally.

Question 9: Wouldn't it be interesting to suggest which output values (not the letter that could be very different among Member States) should be equal to allow comparison and harmonization?

Answer by Dick van Dijk: Actually, what we strongly recommend is to use the same symbols and subscripts in the whole set of CEN-EPBD standards, but also for related non-English national documents. This would be a first step towards harmonization and transparency. Of course, this requires that the quantities behind these symbols are the same, following the same definitions. But, as is suggested in the question, the values can still be different; take for

In order to allow comparison and harmonization the values should also be the same, indeed, but not so much the output values (they result from the calculation procedures and the input, but more the input values. Take for instance the value for the conditioned floor area: even if the definition is harmonized, it may still leave room for different values, because the definition is not specific enough. Even stronger: in most countries the size of the conditioned floor area is an important economic

value, for which detailed rules exist. I chose conditioned floor area as example, because also other input values often depend on this variable, like the assumed number of occupants (hence internal heat gains, hot water demand, ventilation needs, ..).

6 Conclusions and recommendations

The webinar was well received by the participants. More than 70 persons have participated to the webinar. The overall content and quality of the workshop was assessed as good to very good. Also the webinar itself as tool for dissemination was assessed positive.

The main conclusion derived from the presentations at the webinar is that the production of a 2nd generation of CEN EPBD standards is very urgently needed. The update of these standards will make them more usable for the EU Member States, which will have big advantages, such as easier knowledge exchange, stimulation of circulation of products, faster implementation of new solutions, increasing credibility of EU in the world and offering procedures that are ready for the Recast of the EPBD.

Summary of the recommendations from the presentations:

- Recommendation 1: Make a clear separation and balance between common procedures and national/regional elements by introducing a National Annex to the standards with the national choices, boundary conditions and input data.
- Recommendation 2: Make the standards software proof and unambiguous by fully spelling out all equations (100% I/O consistent), adding a spreadsheet for validation and software calibration and for more uniformity in interpretation
- Recommendation 3: Shape all standards in a common format, use common term, definitions and symbols, include overview of I/O variables, flow charts and worked examples
- Recommendation 4: Make the CEN standards EPBD-Recast ready (for nearly zero energy buildings, alternative systems, inspection and component requirements, comparative methodology for cost-optimum calculations etc.)
- Recommendation 5: Create more harmony in the level of detail and reconcile differences (to avoid large discrepancies between simplified and detailed procedures), taking into account needs from the Member States
- Recommendation 6: Various technical improvements will be recommended, to be published in separate CENSE reports
- Recommendation 7: Start now with the upgrade of the CEN standards because (1) now it's the momentum: for the EPBD Recast and (2) the start of the development of a set of ISO standards for building energy performance provides a unique opportunity for Europe to retain the leading role in the global arena.

Annex A- Workshop Programme

Towards a 2nd generation of energy performance calculation procedures in Europe *to increase the accessibility and efficiency of the energy performance calculation procedures in Europe*

At this web event, the CENSE partners will present a series of recommendations regarding a second generation of the CEN standards to support the EPBD.

These recommendations are based upon extensive feed back on the experiences with the national/regional implementation and the use of the current set of CEN-EPBD standards.

The current CEN standards are used in many EU Member States, but often in a "practical way". E.g. by copying parts of CEN standards into national standards or building codes, mixed with national/regional choices and input data.

A more direct use would be much more efficient and transparent.
But at the same time room is needed for national/regional choices.
The recommendations include ways to meet both requirements.

The EPBD-recast calls for a wider spectrum of application, which is also reflected in these recommendations.

The programme for this Webinar is the following:

1. Welcome and Introduction by Mr Dick van Dijk and Mr Berrie van Kampen, TNO (NL)
2. Experiences with the current set of CEN-EPBD standards. The need for a second generation, by Mr. Jaap Hogeling, ISSO (NL)
3. Set of recommendations for second generation of CEN standards on energy performance, by Mr Dick van Dijk, TNO (NL)
4. Examples related to building energy performance including lighting, by Mr Hans Erhorn, FhG-IBP (D)
5. Examples related to heating, ventilation and cooling systems, by Mr Johann Zirngibl and Mr Hicham Lahmidi, CSTB (Fr)
6. Questions, moderated by Mr Jaap Hogeling, ISSO (NL)

For more information on the project, please visit our website www.iee-cense.eu.

This event will be held on **Date and Time:**

March 31, 2010 2:00 pm, Europe Summer Time (Berlin, GMT+02:00).

Annex B– Presentations

The presentations are provided as separate PDF files at the CENSE website (www.iee-cense.eu).

