

The implementation in practice of the EPBD: actual status and the services provided by the EPBD Buildings Platform

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1. THE CONTEXT

The Energy Performance of Buildings Directive (EPBD) lays down requirements as regards:

- the general framework for a methodology of calculation of the integrated energy performance of buildings;
- the application of minimum requirements on the energy performance of new buildings;
- the application of minimum requirements on the energy performance of large existing buildings that are subject to major renovation;
- energy performance certification of buildings; and
- regular inspection of boilers and of air-conditioning systems in buildings and in addition an assessment of the heating installation in which the boilers are more than 15 years old.

These requirements have to be implemented by the 25 EU Member States. The deadline for implementation was January 4 2006. Only for the 2 last requirements (certifications and inspections), Member States may, because of lack of qualified and/or accredited experts, have an additional period of three years (before January 2009) to apply fully.

Within these general principles and objectives, it is the individual responsibility of each EU Member State to choose measures that corresponds best to its particular situation (subsidiarity principle). However, it is clear that collaboration and information exchange can highly facilitate the implementation.

2. INDOOR CLIMATE, RENEWABLES AND THE EPBD

The official text of the EPBD is a relatively short document, whereby indoor climate and renewable energies receive some specific attention.

In article 3 (“Adoption of a methodology”), it is stated that the methodology must be based on the general framework set out in the annex. This annex gives the following specifications:

- The methodology of calculation of energy performances of buildings shall include at least the following aspects:
 - a. thermal characteristics of the building (shell and internal partitions, etc.). These characteristics may also include airtightness;
 - b. heating installation and hot water supply, including their insulation characteristics;
 - c. air-conditioning installation;
 - d. ventilation;
 - e. built-in lighting installation (mainly the non-residential sector);
 - f. position and orientation of buildings, including outdoor climate;
 - g. passive solar systems and solar protection;
 - h. natural ventilation;
 - i. indoor climatic conditions, including the designed indoor climate.
- The positive influence of the following aspects shall, where relevant in this calculation, be taken into account:
 - active solar systems and other heating and electricity systems based on renewable energy sources;

- electricity produced by CHP;
- district or block heating and cooling systems;
- natural lighting.

Furthermore, in Article 5 (“New Buildings”), the following requirements are specified:

“For new buildings with a total useful floor area over 1 000 m², Member States shall ensure that the technical, environmental and economic feasibility of alternative systems such as:

- decentralised energy supply systems based on renewable energy,
- CHP,
- district or block heating or cooling, if available,
- heat pumps, under certain conditions,

is considered and is taken into account before construction starts.”

3. EPBD RELATED SUPPORT ACTIVITIES BY THE EUROPEAN COMMISSION

A successful implementation of the EPBD is a huge challenge and requires often rather similar types of activities by the Member States. Therefore, the European Commission Directorate General for Transport and Energy (DG TREN) is supporting several actions.

3.1 EPBD Concerted Action

The EPBD Concerted Action (January 2005 – June 2007 – www.epbd-ca.org) aims primarily at information exchange between policy makers involved in the implementation of the EPBD in the EU Member States. The global objectives of the EPBD Concerted Action are:

- To enhance and structure the sharing of information and experiences from national implementation and to promote good practice concepts in activities required of Member States for EPBD implementation;
- To create favourable conditions for an accelerated degree of convergence of National procedures in EPBD related matters;
- To complement the work of the Energy Demand Management Committee and its ad-hoc group on CEN standards and Certification exercises.

In the course of this project, a total of eight

2-days meetings are foreseen during which representatives of all Member States (about 80...100 persons) exchange information regarding various EPBD matters.

3.2 EPBD related SAVE projects

In general SAVE projects in the frame of the Intelligent Energy-Europe programme are concerned with the improvement of energy efficiency and the rational use of energy, in particular in the building and industry sectors including the preparation of legislative measures and their application.

In 2005 a significant number of projects were started to directly support in practice the efficient implementation of the EPBD. The projects cover most subjects of the EPBD: Energy requirement for new and existing buildings, Energy certification, Inspection of boilers and air-conditioning system.

3.3 ManagEnergy and Sustainable Energy Europe

These two initiatives are funded in the frame of Intelligent Energy-Europe programme.

- **ManagEnergy** (www.managenergy.net) aims to support the work of individuals and organisations working on energy efficiency and renewable energies at the local and regional level. The main tools are training workshops and online events. Additionally information is provided on case studies, good practice, European legislation and programmes
- The **Sustainable Energy Europe 2005-2008 Campaign** (www.sustenergy.org) aims to raise public awareness and promote sustainable energy production and use among individuals and organisations, private companies and public authorities, professional and energy agencies, industry associations and NGOs across Europe.

3.4 The EPBD Buildings Platform

The EPBD Buildings Platform has officially started in January 2006 for a period of 2 ½ years (till June 2008).

The website www.buildingsplatform.org

The website is the central element in the whole

dissemination strategy of the EPBD Buildings Platform. In principle, all information which is generated in the context of the Platform should be found here. A first version of the website is operational since the beginning of April 2006. A more advanced version is planned for the autumn of 2006 and should include multi-language features.

The newsletter

In order to allow a regular and efficient information exchange with interested people, there is a monthly newsletter. This newsletter will only be distributed in electronic format. From the autumn of 2006, a database driven newsletter is foreseen allowing more providers of information and also contributions in different languages.

A free subscription to the newsletter can be done through the website.

The databases

An easy and centralised access to information is a key objective of the Platform. Therefore, databases play a key role in the dissemination strategy of the Platform.

The following databases are foreseen:

- The implementation of the EPBD is the topic of many workshops, conferences, training events, ... at regional, national and European level. The **events database** data-base will give an overview of these events.
- Information on relevant EPBD related publications will be compiled into the **publications database**. For each publication, there will be an abstract. For all free publications without copy-right restrictions, the full publication is also available in pdf-format.
- A **standards database** will contain information about the most relevant CEN standards in relation to the EPBD implementation.
- A **software database** of available tools contains also information on other building energy related tools.

Information papers

Information papers (IP) are relatively short papers (typical length of 2 to 8 pages). Its main purpose is to inform a wide range of persons of the status of work in a specific area. The following types of information papers are planned:

- Information papers on **EPBD implementation** are foreseen regarding implementation of the EPBD at national level (country reviews) as well as overall at European level (e.g. overall status regarding the energy certificates, inspection of boilers and air conditioning,...)
- It is foreseen to have twice a year an IP regarding the status and progress of those **SAVE projects** which support the implementation of the EPBD. These projects are managed by Intelligent Energy Executive Agency (IEEA).
- Information papers on **standardisation activities** describe the status, progress and planning of those CEN standards which are directly linked to EPBD implementation.
- Information papers on **EPBD related conferences** will present the highlights of those major European conferences where EPBD related aspects are a major topic on the agenda.

All documents will be available in English. In order to reach a wide range of practitioners, it is planned to have translations to other languages (up to 10 languages for certain IP's);

The helpdesk

An electronic helpdesk is part of the Platform. Answers on a wide range of EPBD related questions will be given there, whereby an increased amount of information will become available as function of time. In addition, national representatives and representatives from major associations will have the possibility to raise specific questions through a private part of the website. These questions and answers will in a later stage become available for all interested persons.

Also, there will be a list of possible contact persons in the Member States for handling specific questions.

3.5 EPBD related CEN standards dealing with indoor climate and renewable energy

3.5.1 General

The European Commission decided after consultation of the Member States experts, interest groups and CEN, that there was an urgent need for standards to support the EPBD. The aim is to offer within a short period (2004-2006) a clear and consistent set of standards as basis for the national procedures in the Member States. In

particular the Member States with a very limited experience in the field of the EPBD could benefit from this.

On the long term, harmonisation of the standards will also be attractive for all Member States. The maintenance and further development costs will be lower compared with the situation where all NSB's have to do this on their own. In addition, there is great advantage in having harmonised standards throughout Europe. The widescale implementation of new technical solutions, equipment and systems will become easier if the performance is calculated in a similar way. This means that the industry may have a bigger market throughout Europe which may also benefit their opportunities on the world market.

The development of CEN standards may lead to CEN-ISO standards. The ISO standards are widely accepted and may even increase the market opportunities of the European industry.

Regional differences in climate, building tradition and user behaviour in Europe will have impact on the input data and consequently on the energy performance. These differences will also lead to different choices when it comes to finding the optimum balance between accuracy and simplicity. The standards developed under the EPBD have to be flexible enough to accommodate these differences.

3.5.2 The set of EPBD CEN Standards

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

1. The building physics standards, e.g. describing the calculation of heat transfer by transmission and ventilation, load and summer temperature, solar transmittance and the calculation of the energy need for heating and cooling of the building.
 2. In the second group there are standards on the description and properties (classification) of ventilation systems plus cooling and air conditioning systems.
 3. The third group is focussing on the description of space heating and domestic hot water systems:
 - a. The generation efficiency.
 - b. The emission efficiency.
 - c. Domestic hot water systems.
 - d. Low temperature heating and cooling systems integrated in building elements (embedded systems).
4. A series of supporting standards on:
- e. Lighting systems for buildings (including the effect of daylight)
 - f. Controls and automation for building services
 - g. Classification of the indoor environment
 - h. Financial economic evaluation of sustainable energy applications.
5. A set of standards on inspection:
- i. Boilers and heating systems
 - j. Cooling- and AC systems
 - k. Ventilation systems.
6. And, last but not least, the 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.

3.5.3 Current status of the EPBD CEN standards and where to obtain?

Most of the EPBD CEN standards are currently available as drafts (prEN). Some are already finalised as EN or EN-ISO standards. The standards and draft standards can be ordered from the National Standards Body (see <http://www.cenorm.be/>).

The in total 43 standards or parts are available (the annex lists those standards with a direct or indirect link to indoor climate and renewable energy). The total set contains 2000 pages. It is expected that on the basis of the results of the public enquiry major changes will be made. Thus the standards, to be published for formal Vote by the beginning of 2007, may be different from the current prEN's. Some standards will be merged, definitions and expressions will become better harmonised in the coming months. Some of the informative parts will be deleted. But the core content will not change, so it is of interest to use the current set of prEN's to get a good idea of the final set to be published in 2007.

A substantial number of these standards directly or indirectly (thermal comfort criteria, use of daylight,..) deal with renewable energies.

4. INFORMATION ON VENTILATION, INDOOR CLIMATE AND RENEWABLE ENERGY

The increased use of renewable energies is a major challenge. However, in many cases, the most logical first step would be to avoid or heavily limit the use of energy for heating or cooling, even if this energy is generated by renewable energy sources.

Avoidance or minimisation of heating or cooling demand can be obtained by different ways:

- Use of appropriate indoor climate criteria
- Limitation of transmission and ventilation losses, optimal use of solar gains during the heating season (maximisation) and hot season (minimisation).

Collection and dissemination of information in relation to ventilation and indoor climate is a key area of work for the AIVC and for INIVE EEIG:

- The AIVC (Air Infiltration and Ventilation Centre – www.aivc.org) is one of the official information centres of the International Energy Agency. Since 1979, it informs the international building community about the role of ventilation whereby specific attention is paid to the energy issues. This is done through the website, newsletter, annual conference, technical notes, information papers and several databases, including AIRBASE which contains at present some 17.000 references and more than 2.000 full pdf documents. All information can be consulted through the website whereby part of the information is only accessible by citizens of participating countries in the dissemination activities and through an individual subscription.
- INIVE (International Network for Information on Ventilation and Energy Performance – www.inive.org) groups leading building organisations (BBRI (Belgium), CETIAT (France), CSTB (France), EMPA (Switzerland), ENTPE (France), IBP (Germany), NBI-Sintef (Norway), NKUA (Greece), TNO (Netherlands) and USACE (USA). Its activities include a wide range of technical and dissemination related activities.

5. CONCLUSIONS

- The national implementation of the EPBD will result in minimum energy performance requirements for all new buildings and for major renovations as well as an energy performance certificate for ALL buildings when constructed, sold or rent.
- The EPBD obliges the 25 member states of the European Union to take the positive influence of active solar systems and other heating and electricity systems based on renewable energy sources into account.
- For new buildings with a total useful floor area over 1 000 m², member states shall ensure that the technical, environmental and economic feasibility of alternative systems such as e.g. decentralised energy supply systems based on renewable energy is considered and is taken into account before construction starts.
- A whole series of support measures is set up by the European Commission.

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Part of the information in this paper are based on the Information papers N° 0 and N° 2 (author J. Hogeling) of the EPBD Buildings Platform. Both information papers can be downloaded from www.buildingsplatform.eu. The EPBD Buildings Platform has been launched by the European Commission in the frame of the Intelligent Energy – Europe, 2003-2006 programme. It is managed by INIVE EEIG (www.inive.org), on behalf of Transport and Energy DG. The information provided by the EPBD Buildings Platform is subject to a Disclaimer and Copyright Notice, see http://www.buildingsplatform.org/legal_notices_en.html

REFERENCES

- Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings, Official Journal of the European Communities, January 4 2003
- Wouters, P., van Dijk D., EPBD Buildings Platform: overall context and activities, EPBD Buildings Platform, Information Paper N° 0
- Hogeling, J., The set of CEN standards developed to support the implementation of the EPBD in the EU Member States, EPBD Buildings Platform,

Information Paper N° 2.

ANNEX: OVERVIEW OF CEN STANDARDS

WI 32 - Umbrella document, Overview of relations between EPBD standards - CEN Technical Report

W1 - *Energy performance of buildings – Methods of expressing energy performance and for energy certification of buildings*

CONTENT: Defines:

- a) Global indicators to express the energy performance of whole buildings, including heating, ventilation, air conditioning, domestic hot water and lighting systems. This includes the different possible indicators as well as a method to normalize them
- b) Ways to express energy requirements for the design of new buildings or renovation of existing buildings
- c) Procedures to define reference values and benchmark
- d) Ways to design energy certification schemes

Name of document: prEN15217

W2 - *Energy performance of buildings – Overall energy use, primary energy and CO₂ emissions*

CONTENT: Collates results from other standards that specify calculation of energy consumption within a building; accounts for energy generated in the building, some of which may be exported for use elsewhere; presents summary in tabular form of the overall energy use of the building. Specifies calculation of primary energy consumption and carbon dioxide emission for the building as a whole; gives general principles for the calculation of primary energy factors and carbon dioxide emission factors.

Name of document: prEN15315

WI 3 - *Energy performance of buildings – Assessment of energy use and definition of ratings*

CONTENT: Defines the uses of energy to be taken into account for setting energy performance ratings for new and existing buildings, and provides:

- a) A method to compute the asset rating, a standard energy use that does not depend on occupant behaviour, actual weather and other actual (environment or input) conditions.
- b) A method to assess the operational rating, based on the delivered energy.
- c) A methodology to improve confidence in the building calculation model by comparison with actual energy consumption.
- d) A method to assess the energy effectiveness of possible improvements

Name of document: prEN15203

WI 7 - *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 1: General*

CONTENT: Standardises the required inputs, the outputs and the structure of the calculation method for system energy requirements. Energy performance may be assessed either by values of the system efficiencies or by values of the system losses due to inefficiencies. Based on an analysis of the following parts of a space heating and domestic hot water system:

- the emission system energy performance including control;
- the distribution system energy performance including control;
- the storage system energy performance including control;
- the generation system energy performance including control (e.g. boilers, solar panels, heat pumps, cogeneration units).

Name of document: prEN15316-1

WI 8 - *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2.1: Space heating emission systems*

CONTENT: Energy performance may be assessed either by values of the heat emission system performance factor or by values of the heat emission system losses due to inefficiencies. Method is based on an analysis of the following characteristics of a space heat emission system including control:

- non-uniform space temperature distribution;
- emitters embedded in the building structure;
- control of the indoor temperature

Name of document: prEN15316-2-1

WI 9 - Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2.2: Space heating generation systems:

Part 2.2.1. Combustion systems (Boilers)

Part 2.2.2. Heat pump systems

Part 2.2.3. Thermal Solar systems (including DHW)

Part 2.2.4 The performance and quality of CHP electricity and heat (incl on-site and micro-CHP).

Part 2.2.5. The performance of quality district heating and large volume systems.

Part 2.2.6. The performance of other renewable heat and electricity.

Part 2.2.7. Biomass combustion systems

CONTENT: Provides methods for system efficiencies and/or losses and auxiliary energy. Consists of seven parts.

Name of document: prEN15316- 4-1 to 4-7

WI 10 - Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2.3: Space heating distribution systems

CONTENT: Provides a methodology to calculate/estimate the heat emission of water based distribution systems for heating and the auxiliary demand as well as the recoverable heat emission and auxiliary demand.

Name of document: prEN15316-2-3

WI 11 - Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 3. Domestic hot water systems:

Part 3-1-1 Characterisation of needs (tapping patterns)

Part 3-1-2 Distribution

Part 3-1-3 Storage and generation

CONTENT: Calculation of energy requirements for domestic hot water heating systems including control, for all building types. In three parts:

Name of documents: prEN15316- 3-1 tot 3-3

WI 12 - Ventilation for Buildings - Calculation of room temperatures and of load and energy for buildings with room conditioning systems

CONTENT: Defines procedures to calculate temperatures, sensible loads and energy demands for rooms; latent room cooling and heating load, the building heating, cooling, humidification and dehumidification loads and the system heating, cooling, humidification and dehumidification loads. Gives general hourly calculation method, and simplified methods.

Name of document: prEN15243

WI 13 - Energy performance of buildings – Energy requirements for lighting – Part1: Lighting energy estimation

CONTENT: Specifies the calculation methodology for the evaluation of the amount of energy used for lighting in the building and provides the numeric indicator for lighting energy requirements used for certification purposes. Also provides a methodology for the calculation of dynamic lighting energy use for the estimation of the total energy performance of the building

Name of document: prEN15193-1

WI 14 - Energy performance of buildings – Calculation of energy use for space heating and cooling –

CONTENT: Gives calculation methods for assessment of the annual energy use for space heating and cooling of a residential or a non-residential building, or a part of it. Includes the calculation of heat transfer by transmission and ventilation of the building when heated or cooled to constant internal temperature; the contribution of internal and solar heat sources to the building heat balance; the annual energy needs for heating and cooling; the annual energy required by the heating and cooling systems of the building for space heating and cooling; the additional annual energy required by a ventilation system. Building can have several zones with

different set-point temperatures, and can have intermittent heating and cooling. Calculation period is one month or one hour or (for residential buildings) the heating or cooling season. Provides common rules for the boundary conditions and physical input data irrespective of the chosen calculation approach

Name of document: prEN-ISO 13790

WI 16 - *Thermal performance of buildings – Sensible room cooling load calculation – General criteria and validation procedures*

CONTENT: Sets out the level of input and output data, and prescribes the boundary conditions required for a calculation method of the sensible cooling load of a single room under constant or/and floating temperature taking into account the limit of the peak cooling load of the system. It includes a classification scheme of the calculation method and the criteria to be met by a calculation method in order to comply with this standard. Purpose is to validate calculation methods used to evaluate the maximum cooling load for equipment selection and HVAC system design; evaluate the temperature profile when the cooling capacity of the system is reduced; provide data for evaluation of the optimum possibilities for load reduction; allow analysis of partial loads as required for system design, operation and control.

prEN15255

WI 17 - *Thermal performance of buildings – Calculation of energy use for space heating and cooling – General criteria and validation procedures*

CONTENT: Specifies the assumptions, boundary conditions and validation tests for a calculation procedure for the annual energy use for space heating and cooling of a building (or of a part of it) where the calculations are done on an hourly basis. Does not impose any specific numerical technique. Purpose of this standard is to validate calculation methods used to describe the energy performance of each room of a building; provide energy data to be used as interface with system performance analysis (HVAC, lighting, domestic hot water, etc).

Name of document: prEN15265

WI 19 - *Ventilation for buildings – Calculation methods for the determination of air flow rates in buildings including infiltration.* (The items 18 and 19 are merged)

CONTENT: Describes method to calculate the ventilation air flow rates for buildings to be used for applications such as energy calculations, heat and cooling load calculation, summer comfort and indoor air quality evaluation. Applies to mechanically ventilated buildings; passive ducts; hybrid systems switching between mechanical and natural modes; window opening by manual operation for airing or summer comfort issues

Name of document: prEN15242

WI 20 - *Ventilation for buildings – Calculation methods for energy requirements due to ventilation systems in buildings* (merged with 21)

CONTENT: Describes method to calculate the energy impact of ventilation systems (including airing) in buildings to be used for applications such as energy calculations, heat and cooling load calculation. Its purpose is to define how to calculate the characteristics (temperature, humidity) of the air entering the building, and the corresponding energy required for its treatment as the auxiliary electrical energy required.

Name of document: prEN15241

WI 22 - *Calculation methods for energy efficiency improvements by the application of integrated building automation systems*

CONTENT: Defines and specifies the performance of standardised energy saving and optimisation functions and routines of Building Automation and Control Systems (BACS) and Technical Building Management (TBM) systems and services. Summarises the methodologies to calculate/estimate the energy demand for heating, ventilation, cooling, hot water and lighting of buildings and expresses the results of energy saving and efficiency in buildings by the application of the different BACS energy saving functions.

Name of document: prEN15232

WI 23 - Review of standards dealing with calculation of heat transmission in buildings. – 1st set

- *Thermal performance of building components*
 - *Dynamic thermal characteristics – Calculation methods*
- *Thermal performance of buildings – Transmission and ventilation heat transfer coefficients – Calculation method*
- *Thermal performance of windows, doors and shutters – calculation of transmittance Part 1: General*

Name of documents: prEN-ISO 13786 – 13789 - 10077-1

WI 24 - Review of standards dealing with calculation of heat transmission in buildings. – 2nd set

- *Building material and products - Hygrothermal properties – Tabulated design thermal values and procedures for determining declared and design values*
- *Heat transfer via the ground – calculation methods*
- *Thermal bridges – Heat flows and surface temperatures – detailed calculations*
- *Thermal bridges – Linear transmittance – simplified methods and default values*
- *Thermal resistance and thermal transmittance – calculation method*

Name of documents: prEN-ISO 10456 – 13370 – 10211 – 14683 - 6946

WI 25 – *Ventilation for non residential buildings – Performance requirements for ventilation and room conditioning systems.* (revision of EN 13779:2003)

CONTENT: Gives performance requirements for ventilation systems. Applies to the design of ventilation and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. (Applications for residential ventilation are dealt with in prEN 14788.).

Name of document: prEN13779

WI 26 - *Design of Embedded water based surface heating and cooling systems:*

Part 1: Determination of the design heating and cooling capacity

Part 2: Design, Dimensioning and Installation

Part 3: Optimizing for use of renewable energy sources

CONTENT: Applies to water based surface heating and cooling systems in residential, commercial and industrial buildings, for systems integrated into the wall, floor or ceiling construction without any open air gaps. In three parts:

Part 1: Determination of the design heating and cooling capacity

Part 2: Design, dimensioning and installation

Part 3: Optimising for the use of renewable energy sources

Name of documents: prEN15377 - 15377-1 - 15377-2 - 15377-3

WI 27 - *Performance requirements for temperature calculation procedure without mechanical cooling.*

CONTENT: Specifies the assumptions, boundary conditions, equations and validation tests for a calculation procedure, under transient hourly conditions, of the internal temperatures (air and operative) during the warm period, of a single room without any cooling/heating equipment in operation. No specific numerical techniques are imposed by this standard. Validation tests are included

Name of document: EN13791

WI 28 – *Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – Simplified method.*

CONTENT: Specifies the required input data for simplified calculation methods for determining the maximum, average and minimum daily values of the operative temperature of a room in the warm period, to define the characteristics of a room in order to avoid overheating in summer at the design stage, or to define whether the installation of a cooling system is necessary. Gives criteria to be met by a calculation method in order to satisfy the standard

Name of document: EN13792

WI 29 - *Data requirements for standard economic evaluation procedures related to energy*

systems in buildings, including renewable energy sources.

CONTENT: Provides data and calculation methods for economic issues of heating systems and other systems that are involved in the energy demand and consumption of the building

Name of document: prEN15459

WI 31 – Criteria for the indoor environment, including thermal, indoor air quality, light and noise.

CONTENT: Specifies the parameters of impact and/or criteria for indoor environment and how to establish indoor environmental input parameters for the building system design and energy performance calculations. Also specifies methods for long term evaluation of the obtained indoor environment as a result of calculations or measurements. Applicable mainly in the non-industrial buildings where the criteria for indoor environment are set by human occupancy and where the production or process does not have a major impact on indoor environment.

Name of document: prEN15251.