



CEN-CENSE-REHVA Workshop
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**CEN Standardization and
implementation at the national level of
the CEN standards for the EPBD**

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Outline of this presentation



- The CEN standards to support the implementation of the EPBD in the Member States
- Their current use in the Member States
- Why 2nd generation of CEN-EPBD standards?

The CEN-standards to support the EPBD

Prepared on the basis of:

European Commission **Mandate 343** to CEN
(Jan.2004):

*...the elaboration and adoption of standards for a methodology calculating the **integrated energy performance of buildings** in accordance with the **EPBD***

A variety of (related) subjects



- Overall energy performance
- Energy needs and energy use for:
 - Heating
 - Cooling
 - Ventilation
 - Lighting
 - Domestic Hot Water
- Inspection of systems (H, V, C)

CEN organisation

CEN TC 371, Project Committee on Energy Performance of Buildings. Chair: Jaap Hogeling (NL)

- **Five existing Technical Committees to develop the standards:**

- TC 89, Thermal performance of buildings and building components
- TC 228, Heating systems in buildings
- TC 156, Ventilation for buildings
- TC 247, Controls for mechanical building services
- TC 169, Light and lighting



The starting point... Tower of Babel
towards the CEN TR15615



Energy demand

Energy consumption

Required energy

Energy use

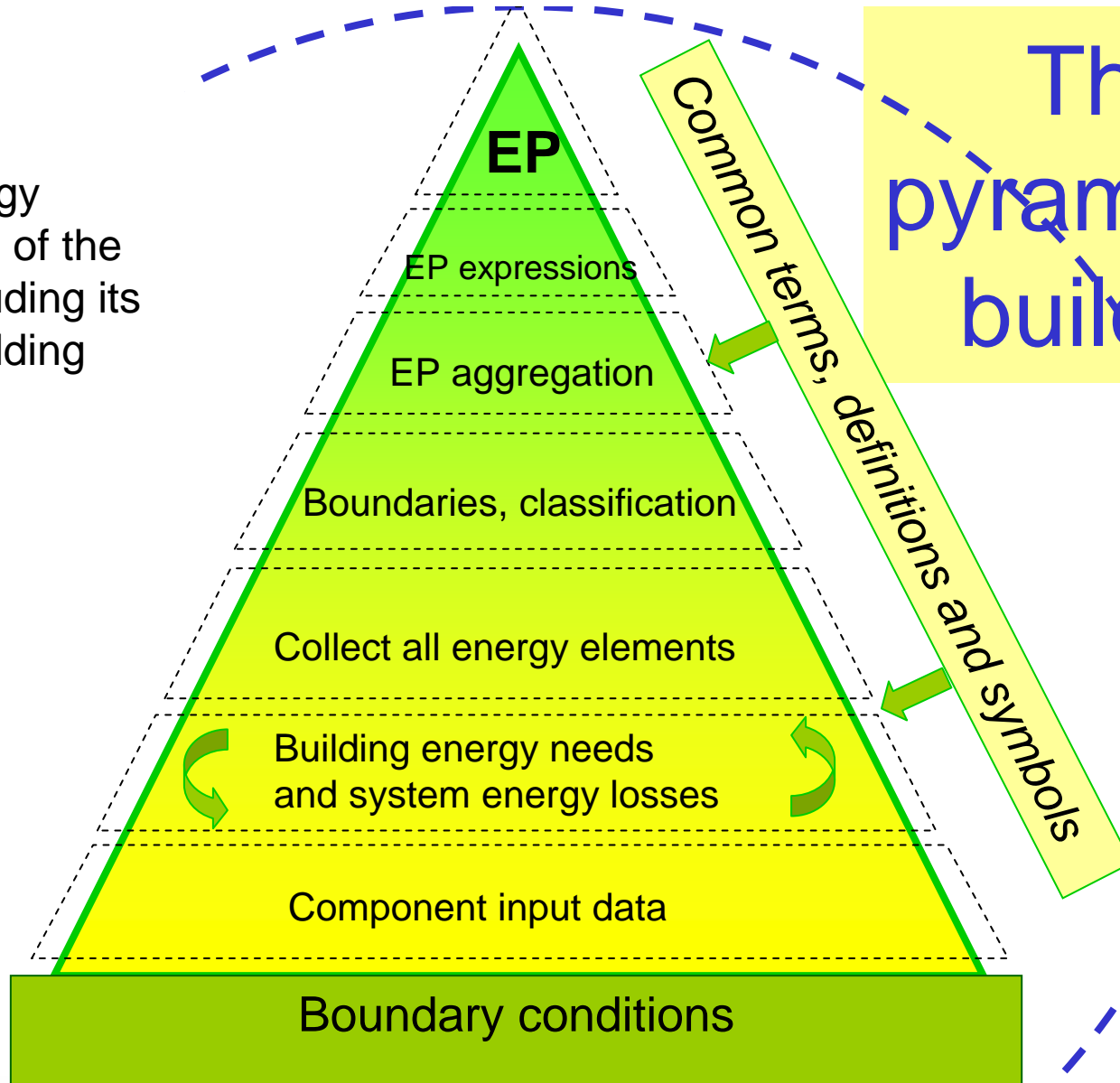
Net energy use

Delivered energy

Energy need

EP:

Overall Energy Performance of the building including its technical building systems



The pyramid to build...

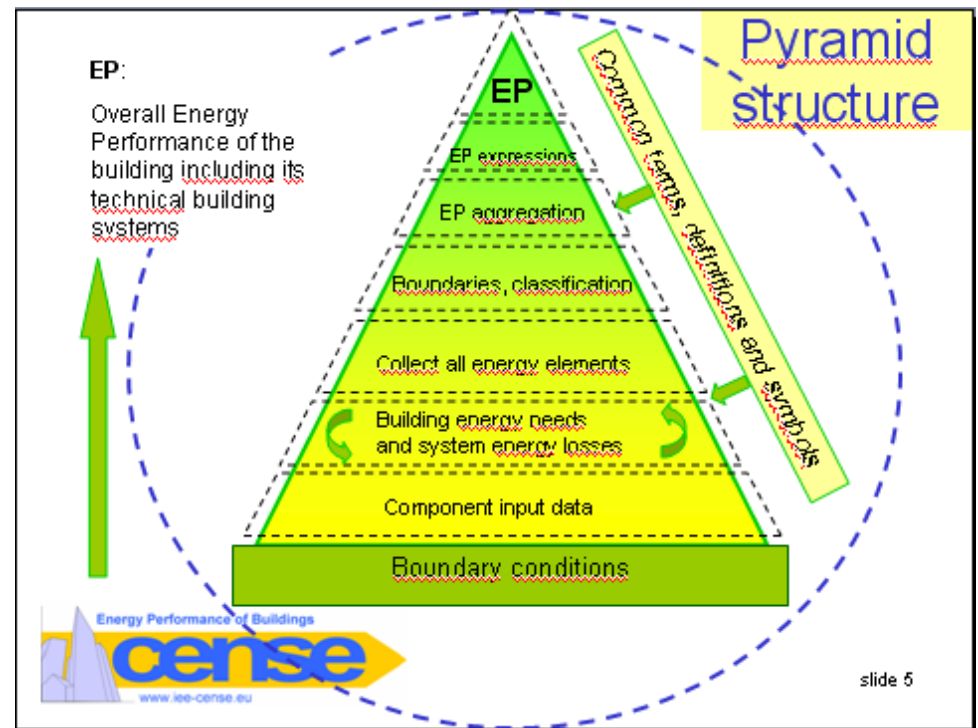
Common terms, definitions and symbols

Result

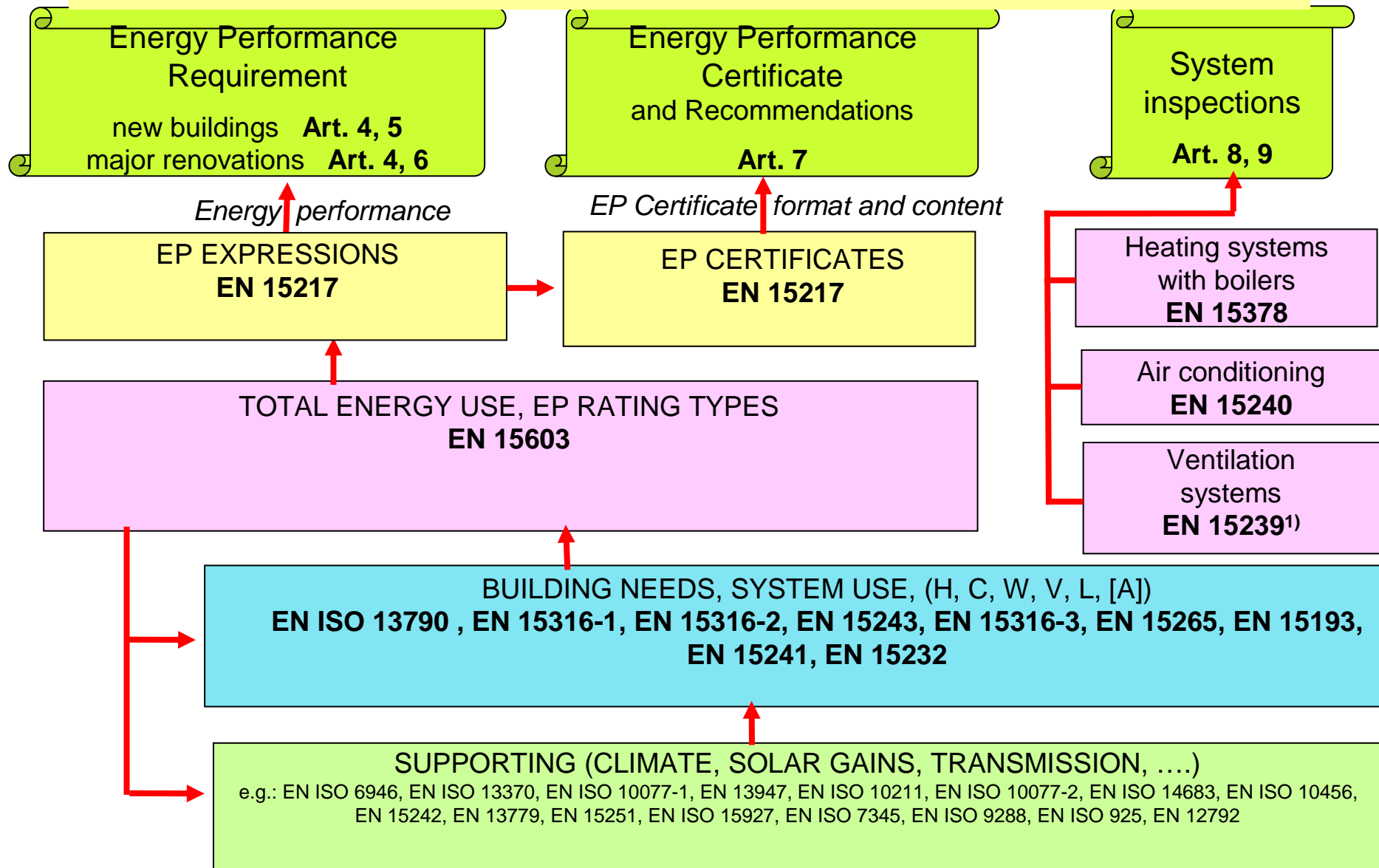
- Over 30 CEN-standards published (2007-2008)
- Most are used in many MS, but “in a practical way”



Energy Performance of Buildings



→ Clusters of standards covering different levels and topics



1): Not explicitly mentioned in the Directive

But: consistency (structure and levels of detail) not yet ideal

- Causes:

- Timeschedule was extremely tight: flying start required
- Not all work started from scratch
- Many MS had, at the time, no or little experience with overall EP requirements → various options needed to accommodate different expectations
- Subsidiarity principle in EPBD: implementation not mandatory



How are the CEN standards implemented in practice?

Actual situation

- CEN-EPBD standards are used in many EU Member States ; often in a “practical way”: by copying and/or completing parts of CEN standards into national standards or building codes

Some of the main reasons:

- Phase difference
- Need for (‘all-in’) national (or regional) document
- CEN-EPBD standards are not optimized as reference documents

→ Illustration:



Example: current standards often mix of common procedure and national choices

A building generally uses more than one energy carrier. Therefore, a common exp carriers shall be used to aggregate the used amounts, sometimes expressed in vari having various impacts.

According to this standard, the aggregation methods are based on the following impa have:

- Primary energy;
- Carbon dioxide emission;
- Parameter defined at national level.

NOTE Cost is a parameter that may be used

8.3.3 Primary energy factors

There are two conventions for defining primary energ

- Total primary energy factor. The conversion fact point of use (production outside the building s; primary energy conversion factor always exceed
- Non-renewable primary energy factor: The conve to the point of use but exclude the renewable er primary energy conversion factor less than unity

The primary energy factors shall include at least:

- Energy to extract the primary energy carrier;
- Energy to transport the energy carrier from the p
- Energy used for processing, storage, generatic necessary for delivery to the building in which the

The primary energy factors may also include:

- Energy to build the transformation units;

Example: current practical application of EN 13790 (Energy use for heating and cooling)

7.2.1.1 Energy need for heating

CEN: EN ISO 13790

For each building zone and each calculation step (month or season), the building energy need for space heating, $Q_{H,nd}$, for cooling, $Q_{C,nd}$, and for ventilation, $Q_{V,nd}$, is given by:

$$Q_{H,nd} = Q_{H,nd,cont} + Q_{H,nd,ht} + Q_{H,nd,gn}$$

where (for each building zone):

$Q_{H,nd,cont}$ is the energy need for space heating, expressed in kWh/m²·a, given by:

$Q_{H,ht}$ is the energy need for space heating, expressed in kWh/m²·a, given by:

$Q_{H,gn}$ is the energy need for space heating, expressed in kWh/m²·a, given by:

$\eta_{H,gn}$ is the efficiency of the heating system, given by:

5

5.1

DESCRIZIONE SINTETICA DELLA PROCEDURA DI CALCOLO

Italy: UNI/TS 11300-1

La procedura di calcolo comprende i seguenti passi:

- 1) definizione dell'edificio
- 2) definizione delle zone
- 3) definizione delle condizioni esterne
- 4) calcolo delle perdite per il riscaldamento
- 5) aggregazione dei risultati

Al punto 4) si calcola il riscaldamento raffrescamento

$$Q_{H,nd} = Q_{H,ht} + Q_{H,gn}$$

$$Q_{C,nd} = Q_{C,gn}$$

dove:

$$Q_{H,nd}$$
 è il f

7.1.2.1 Netto warmtebehoefte per maand per rekenzone [A]

Netherlands: draft NEN 7120

zi, in maand, mi, a

Met weglating van de indic...

$$Q_{H,nd,net} = a_{H,red} (Q_{H,ht} + Q_{H,gn})$$

Met als ondergrens: $Q_{H,nd,net}$

waarin (voor elke rekenzor

$Q_{H,nd,net}$ is de netto

$Q_{H,ht}$ is het total

$Q_{H,gn}$ is de totale

5.2.2 Bilanzgleichung für

Germany: DIN V 18599-2

den Ausnutzungsgrad miteinander mit der Anzahl der Teilbetriebstagen und Tagen mit

$$Q_{h,b} = Q_{sink} - \eta Q_{source}$$

Dabei ist

$Q_{h,b}$ der Heizwärme für Betriebstaa



In short: main difficulties for better use of current 1st generation CEN-EPBD standards

- Need for clear separation between *common procedures* and *national/regional choices and input data*
- Need for more consistency and transparency of the overall structure
- Too many options
- But: strong interest from target groups (European industry, building professionals and key actors from the Member States) in 2nd generation standards
→ Proposal (in next presentation)

About cooperation CEN – ISO (1)

- CEN operated at European level
- ISO operates at the global level
- In many cases standards are developed in cooperation → EN-ISO standards
- **Already several EN's are EN-ISO**
– Examples:



EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM	EN ISO 13790 March 2008	ISO 10211
ICS 91.120.10	Supersedes EN 832:1998, EN ISO 13790:2004	ISO 10077-1
English Version	ISO 15927-4 First edition	ISO 13370 Second edition 2007-12-15
Energy performance of buildings - Calculation of energy use for space heating and cooling (ISO 13790:2008)		ISO 6946 Second edition 2007-12-15

About cooperation CEN – ISO (2)

- Expected intensified cooperation CEN-ISO
- CEN standards used as basis
- Taking the recommendations for improvements into account
- With European experts retaining the initiative



ISO/TC 163/WG 4, Joint TC 163-TC 205 Working Group
Energy performance of buildings using holistic approach

Draft strategic view on the role of the JWG

This draft was prepared by
Jaap Hogeling (JWG Advisory Group Leader), Dick van Dijk and Essam Khalil



Impact of 2nd generation of CEN-EPBD standards (1)



- CEN standards more usable as direct reference & high transparency in national choices
 - Higher efficiency: at national level concentrate at the national specialties
 - ... and on active contribution to the improvement of the common procedures (“the physics”)
- Easier international knowledge exchange and shared research
- Increased circulation of products, services and property data
 - Towards more EU product data coupled to EP calculations
 - Towards less use of confusing national or non-EU labels...
- More uniform info on quality of building stock

Impact of 2nd generation of CEN-EPBD standards (2)

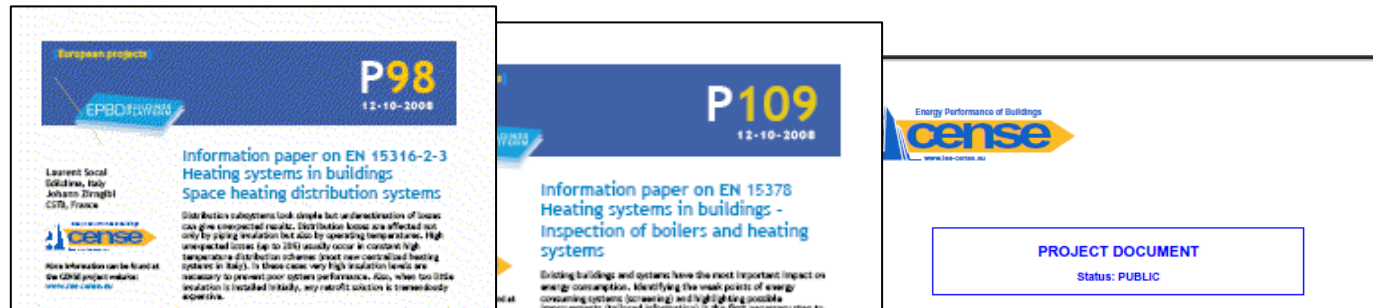


- Faster implementation of new solutions
 - Better comparable energy performance levels and impact of innovations
- Increased credibility of EU in the world
 - Retaining the initiative in the global arena
- EPBD Recast ready
(more in next presentation)
- >> High performance European tools leading to high performance buildings

**Current status: Under discussion
between CEN and DG ENER**

More in the next presentation

More information and downloads: www.iee-cense.eu



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