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Applying the EPBD to improve the Energy Performance Requirements to Existing Buildings

ENPER-EXIST

Challenges to calculate the ratings for existing buildings:

The experience of ENPER-EXIST (work package 1)

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Content of the presentation

- Short overview of aims
- Short explanation on CEN work
- Overview of work done and work in progress
- Results and findings

Objective of the task

- 1. Identify the gaps between CEN & practice for existing buildings
  - Which input parameters does the method use to describe the system or the procedure?
  - Which are the problems with data collection?
  - Are there influencing factors, specifically relevant for existing buildings, not taken into account?
- 2. Make recommendations (pro's and con's of different options)
  - Based on national experiences
  - To identify solutions for gaps found in first task

Short explanation of CEN work

CEN focus on existing buildings where relevant

Overall standards

Certificate

Total energy use

General procedures

Building standard

Energy needs for heating and cooling

Supporting standards

window

thermal bridges

Indoor climate

insulation

glass

climate

Focus ENPER-Exist on existing buildings

heating

cooling

ventilation

lighting

System standards

Why assessment of energy use is not the same for new and existing buildings?

- Different objectives
- Different level of input data

Different objectives

- New buildings:

  Main objective: enforce minimum energy performance level → **legal implications**

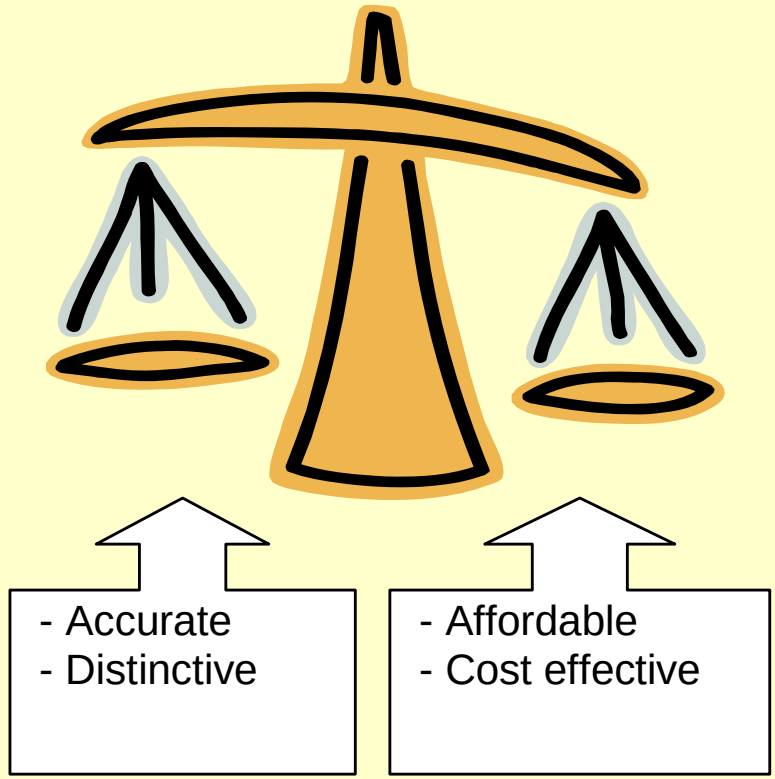
- Existing buildings:

  Main objective: enable correct evaluation of status of building and of recommendations → provision of **information**

Different balance in quality aspcts

Different balance between:

- Legally secure
- Objective
- Transparent
- Reproducible
- Verifiable
- Accurate
- Distinctive
- Cost effective (data acquisition)



Different level of input data

Different data acquistion proces:

New buildings:

→ Design/construction drawings,

versus product information, measurement details

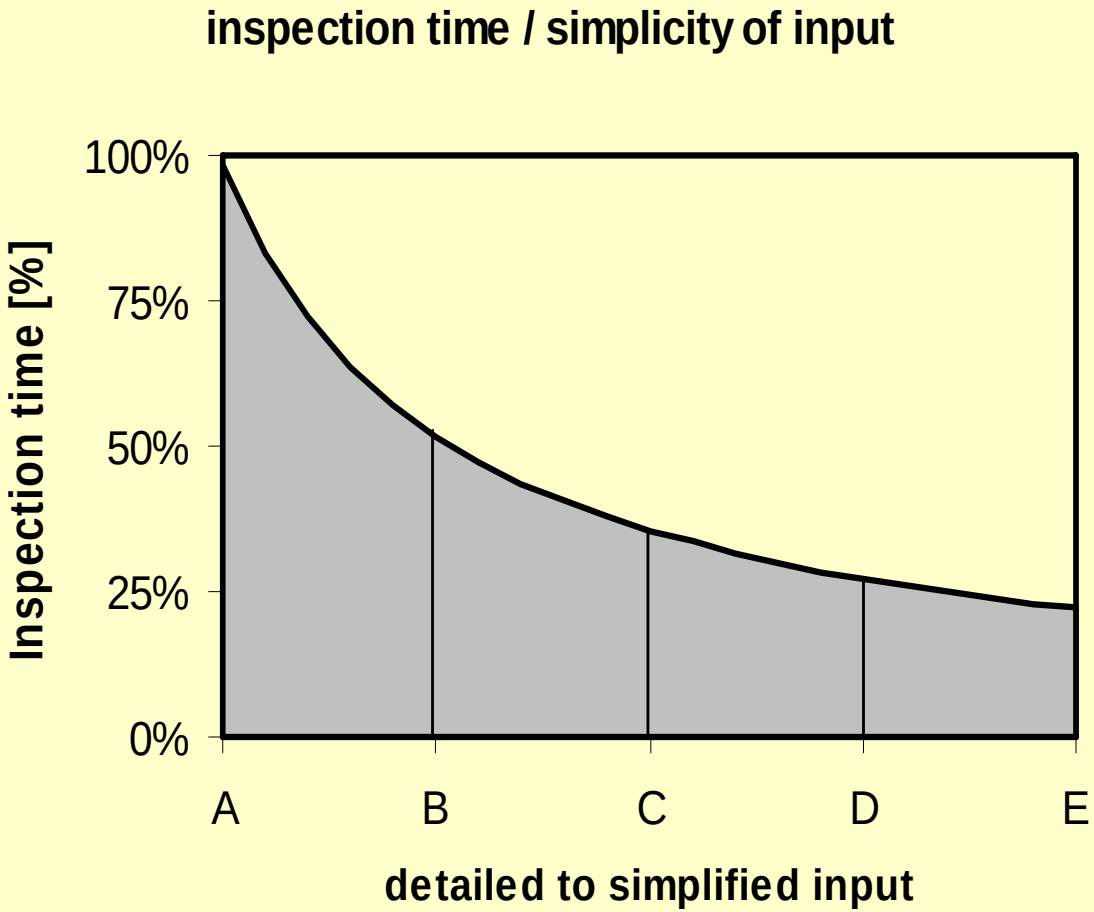
Existing buildings:

→ Visit to the building

Accuracy of calculation result:

→ Level of detail of method

→ Accuracy of input data

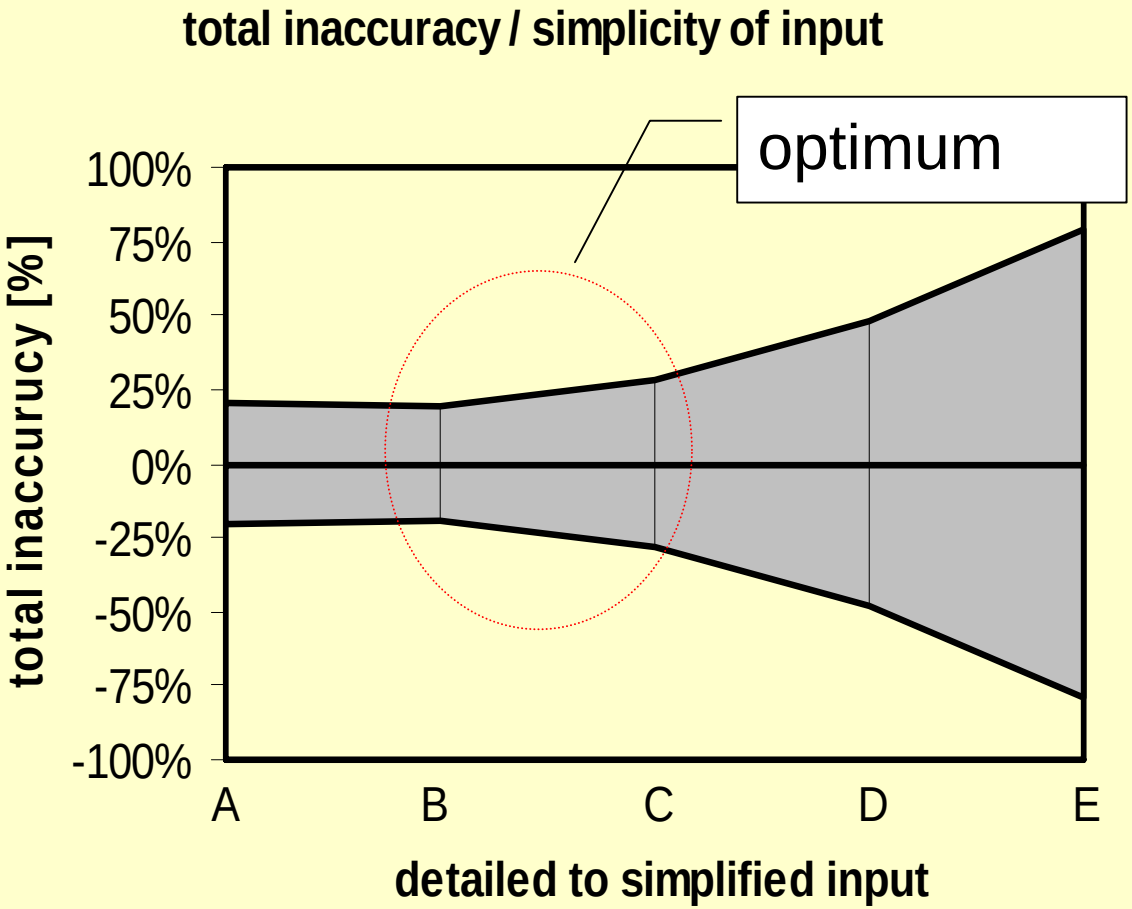


From A to E:

less detailed input ➔ less accurate, but also:

less errors in input ➔ Optimum: somewhere in between

Picture: Courtesy EBM-Consult (NL)



Balance between accuracy and quality of input for existing buildings with limited information

Picture: Courtesy EBM-Consult (NL)

Task: Assistance to bridge the gap

- Analyses of the relevant CEN draft standards (prEN's)
  - Aim: to give direct feedback to CEN
- Pilot study of the data collection
  - Aim: to test the data collection in practice
- Alternative solutions
  - Aim: to give pro's and con's of alternatives

Example of some concrete results (1)

- CEN agreed:
  - Simple methods needed to reduce data acquisition for e.g.
    - thermal bridges
    - sunspaces
    - unconditioned spaces
  - Annexes with examples of national values on e.g.
    - nocturnal insulation
    - air tightness
    - internal heat sources
    - internal heat capacity

Example of some concrete results (2)

- CEN takes over various advices
  - E.g. on problem with local heating in old houses:
    - poor thermal comfort
    - but low energy consumption: good energy performance
  - Suggestion which was taken over:
    - assume for the calculation as standard conditions: all spaces are *considered as* heated

Investigation of alternative methods

- An analysis of pro's and con's of various alternatives for existing buildings
- Based on (national) experiences: national methods and methods developed in e.g. EU projects

Investigation of alternative methods

- Some concrete examples (1):
  - Simple methods from various countries available for e.g.:
    - Thermal bridges
    - Sunspaces
    - Unconditioned spaces
    - External shading
    - Fan power
    - Duct lengths (concerning ventilation losses)
    - Air flow rates
    - Default values for boiler and DHW efficiencies

Investigation of alternative methods

- Some concrete examples (2):
  - Examples from countries regarding databases/libraries on:
    - Constructions
    - Materials
    - Boiler properties
  - Alternative methods:
    - Cooling load for non A/C buildings

More general: Some findings (draft) (1)

To apply CEN standards to existing buildings, we have to:

1. Select among the different options offered the option which is well adapted to existing buildings

- The standards contain different options, even sometimes simple ones
- But the different options are generally based on different national approaches, not on rational considerations regarding existing buildings
- There should be a statement in each standard to explain which methods are adapted to existing building

Some findings (draft) (2)

To apply CEN standards to existing buildings, we have to:

2. Define the input parameters necessary to describe the system

- The standards contain various input parameters which are difficult to obtain
- Simple options often rely on national annexes:
  - Gives a lot of flexibility and freedom to the countries
  - Gives a high burden on shoulders of countries
  - Gives no guidance to inexperienced countries
- Alternative approaches are:
  - Define European data base enabling to get values of the parameters (probably too difficult but a good opportunity for common work with the industry. Good opportunity for component labeling)
  - Define informative annexes in the standard which could be used if no national annex is available

Some findings (draft) (3)

To apply CEN standards to existing buildings, we have to:

3. Improve the standards on a series of points to facilitate application to existing buildings

- Enper-Exist points out specific issues to be improved
- This is a long term work because only few countries have experience with existing buildings

Summarising the results

Comments on how to improve the CEN standards for existing buildings

Test on the problem of data collection (by applying procedures to example buildings)

Comments on the advantages and drawbacks of the different options offered by several standards

Definition of strategy for further steps at the CEN level

Results

(Final) draft reports already available on:

www.enper-exist.com

Section: Results / Reports