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

ENPER-EXIST

Rating experiences in The Netherlands

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Content of the presentation

- Design rating new buildings
  - Mandatory national minimum overall EP requirements since 1995
  - Voluntary product labeling, link to EP regulations
- Asset rating:
  - From voluntary EP advice….
  - …towards EP Certificate

Design rating new buildings

- In The Netherlands: Overall energy performance regulations since 1995
  - Building types:
    - Residential
    - Non-residential
  - Energy aspects:
    - Heating, cooling, ventilation, hot water and lighting
    - Including system performances
    - Including renewables (heating, cooling, electricity)
  - Monthly calculation method

➔ Long-years experience

- Revisions each few years
  - Based on feed back, new developments
  - And due to tightened minimum levels each few years
    - Example for dwellings:
    - 1995: max. EPC = 1.4
    - 2006: max. EPC = 0.8
- Consequence:
  - Gradually: an increased number of techniques are appreciated in the method
  - ➔ several new techniques penetrated in the market
  - Method remained basically the same

Minimum EP regulations versus minimum product requirements?

- No!
  - Minimum *product* requirements stimulate application of new products until *minimum* level
  - Minimum *EP requirements* stimulate at product level also application of *more innovative* techniques
  - If good energy performing products are well-recognised in the calculation method: fast penetration possible
    - For instance via Product Labeling

Examples in The Netherlands

Experiences in e.g. NL with EP Regulations show for instance:

⇒HF Lighting became standard in Office Buildings

⇒High performance insulating glazings became standard

⇒Condensation boilers became standard in residential buildings

But (of course): level of requirements is important

Typical timeline (from experience in The Netherlands), in case of minimum EP-requirements

1. Introduction of innovative technologies on the market
   - No standard method yet => performance appreciated via "Principle of Equivalence"
2. Penetration grows slowly
   - More experience
   - Adoption of assessment method in standard procedures
   - (preferably in parallel) Set up of voluntary product labeling, linked to assessment method
3. Penetration grows rapidly
   - More experience in practice ➔
     - Optimisation: quality improvements
     - Further development: new labels
4. Tightened EP requirements

Conditions for product labeling

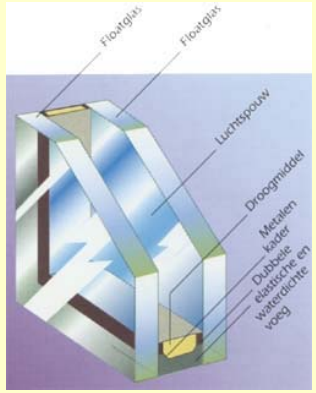
- Should characterize specific product
- Should categorize product performance in a clear way
- Should be developed by market
- Preferably: to be 1:1 recognised in EP calculation procedures
  - Limitation: national standard cannot refer directly to voluntary product labels: EU free market!
    - ➔ best if label is directly linked to output of a national or CEN standard

Examples

- **National label condensation boiler:**
  - **HR label ⇒ HR-100 label ⇒ HR-104 label ⇒ HR-107 label**
- **National label high performance glazing:**

  HR label ⇒ HR+ label ⇒ HR++ label
- **High Performance ventilation heat recovery units**
- **Heat pumps**

  Improved performance



Example of ventilation heat recovery systems

- **Product development**

  Efficiency increased from 60% to 75% - 90% with the development of High performance heat recovery units

⇒ **Penetration rate**

NL: in 2002 increase of 34% regard to 2001; 1 on 3 new residential buildings have balanced ventilation with heat recovery

⇒**Costs**

Reduced by increased penetration

⇒**Performance**

⇒Once penetration increased: further optimisation of EP and system quality

Conclusion: EP regulations DO cause changes in the building and technology market

EP regulations are an important market transformation mechanism, but the effectiveness depends on:

- **Level of requirements**
- **Level of maintainability & compliance**
- **Development of regulations in step with the development of technology**
- **…**

Asset rating existing buildings in The Netherlands

- Voluntary energy performance rating/advice
  - Residential
    - In operation since several years (EPA)
  - Non-residential
    - Partly in operation/preparation (EPA-U)

From EPA to EP certificate

- EP-certificate requires re-thinking of objectives
- Issues:
  - Accuracy (=appreciate techniques and improvements)
  - Reproducibility (= consistency in rating)
  - Time effort needed for inspection (=related to complexity of gathering input data)
  - ➔ Optimisation of cost effectiveness of inspection (data gathering) needed

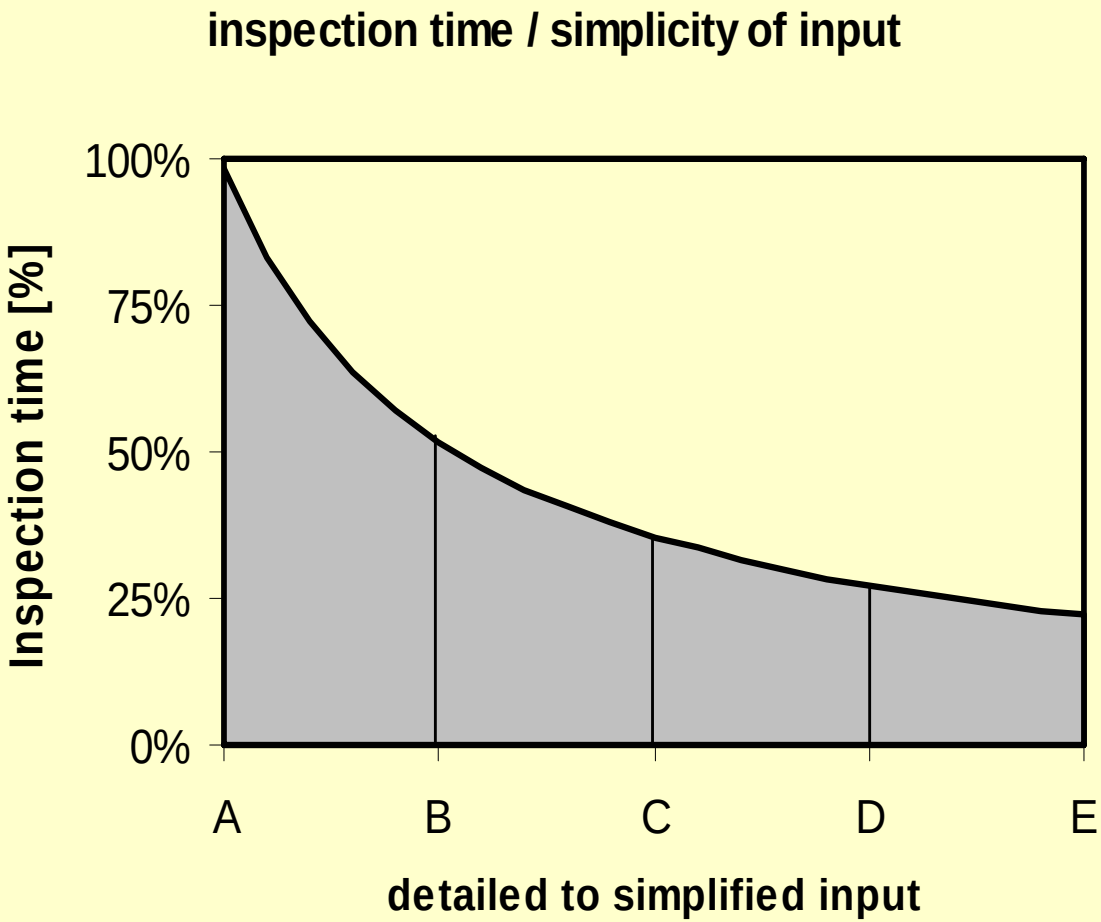
Recent study by EBM-Consult

- Five methods:
  - A-D: monthly calculation method:
    - A: detailed input
    - B: less detailed input
    - C: ..
    - D: ..
  - E: Set of reference buildings

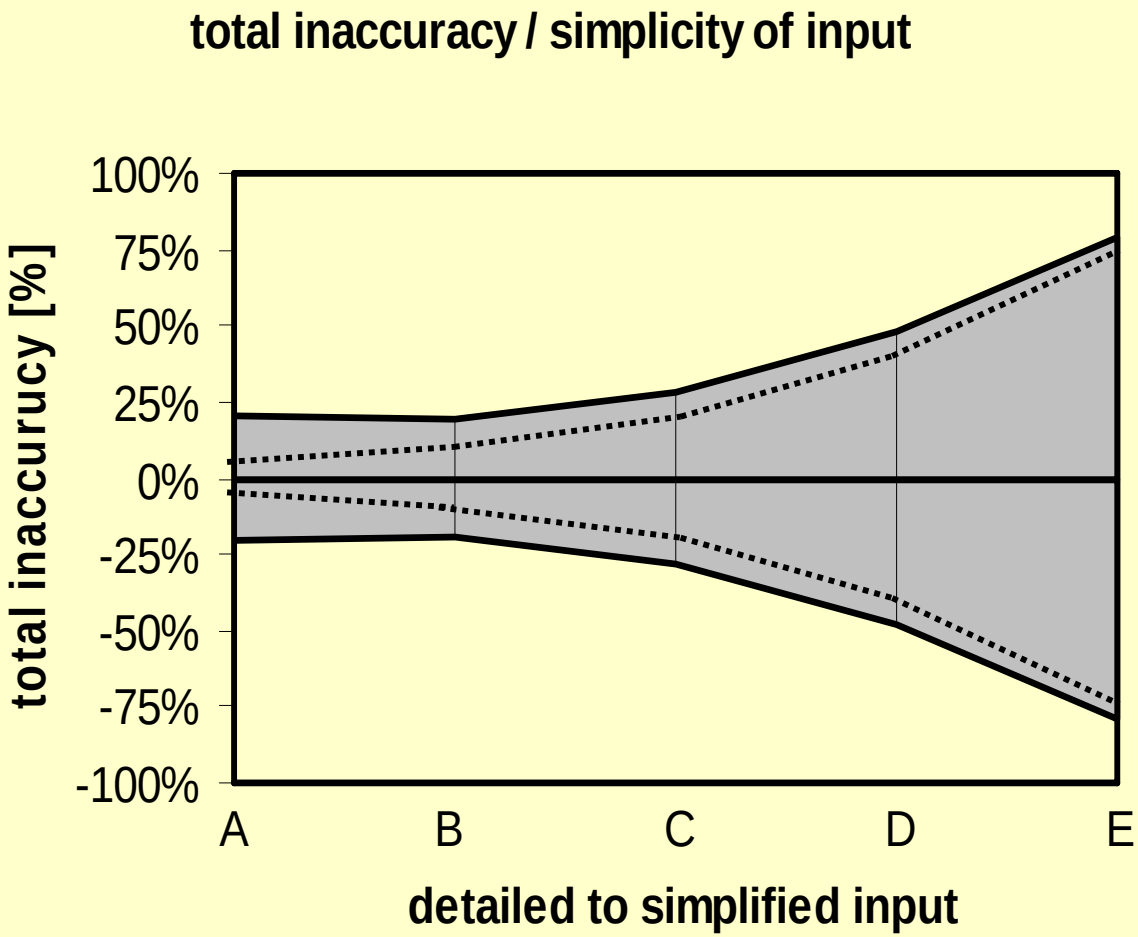
Recent study by EBM-Consult

- Large sensitivity study:
  - Effect of methods A-E on:
    - Inspection time
    - Inaccuracy (taking into account likelyhood of errors made in input (guesses, mistakes)
    - Reproducibility

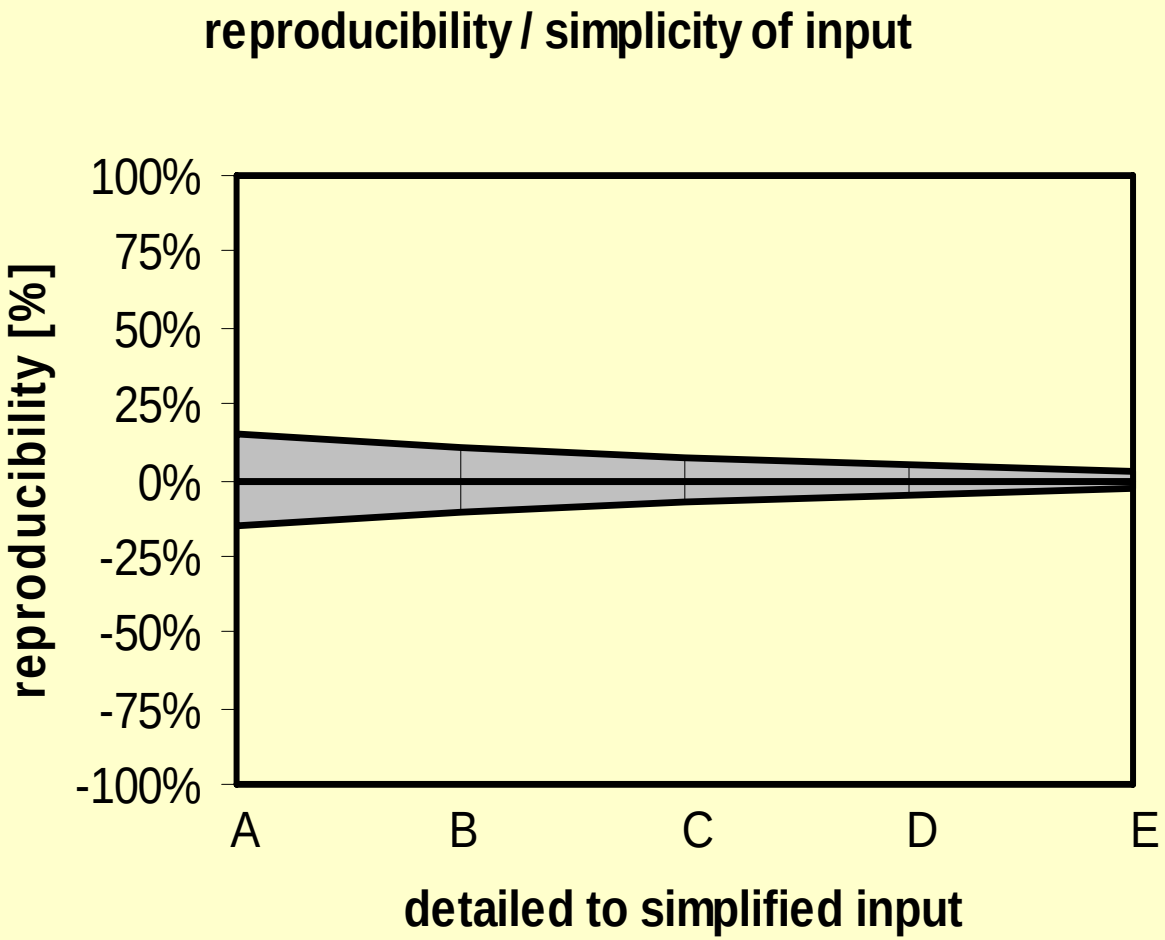
Results inspection time



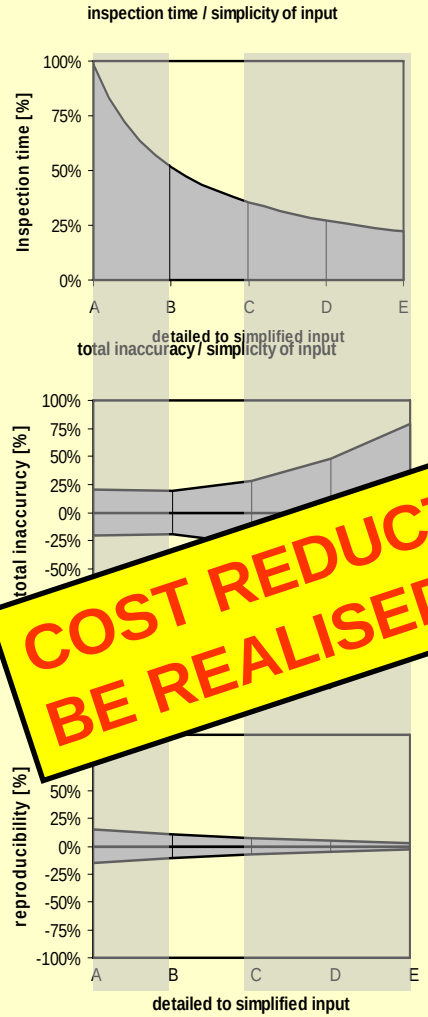
Results inaccuracy



Results reproducibility (study by EBM-Consult)



Conclusions



LEVEL OF SIMPLIFICATION IS B - C

- **Reduction of inspection [illegible]%**
- **Inaccuracy [illegible]**
- **[illegible] less than 7%**
- **[illegible]age of all common measures and most of the exceptional ones**
- **Modest level of expertise consultants**
- **Simplified quality control**

COST REDUCTION MAINTAINING THE QUALITY CAN BE REALISED FOR THE DUTCH BUILDING STOCK!

Conclusions

- New buildings:
  - Multi-year experience with national building regulations with minimum overall EP rating
    - Not too detailed monthly method is well-suited
    - Product labeling may be quite helpful for the user and the market
- EP-advice instrument is not automatically the optimum instrument for EP-certificate:
  - Cost-effectiveness can be significantly optimised by reconsidering the input data gathering

Bonus slide….

Anecdotic experience from operational rating

- If chosen to be corrected for climate, occupation, operation (from actual to standard conditions)
  - Sometimes complicated and doubtful correction factors introduced
  - With sometimes requiring the same input parameters as a (simple) calculation model would have required….
  - ➔ consider use of “validated modelling approach”