



Concerted Action EPBD III

Cost-Optimal Regulation

Practical implementation of the framework

World Sustainable Energy Days
Stakeholder Meeting “nZEB – The vision for 2020”
Wels, Austria, 2 March 2012

Kirsten Engelund Thomsen
Danish Building Research Institute, SBi, AAU

CA EPBD III - CoreTheme 4 – Cost-optimum procedure



- > Energy performance requirements using the cost-optimum methodology
- > Questions relating to articles 4-6 of EPBD and Articles 3-8 as well as Annex I and III of the EPBD recast



EPBD recast – Article 2 and 4



- > The EPBD obliges Member States (MS) to: “assure that minimum energy performance requirements for buildings or building units are set with a view to achieving cost-optimal levels”
- > Cost-optimal level is defined as: “the energy performance level which leads to the lowest cost during the estimated economic lifecycle”
- > MS will determine this level taking into account a range of costs like investment, maintenance and operating costs

Purpose with comparative methodology – preamble 14



- > Detect gap between cost optimal level and the MS requirements
- > Accuracy and applicability differ in EU- and national level, so no harmonization of requirements
- > The performance of 15% or more between the cost optimal level and the requirements has to be detected
- > The purpose is not to compare across MS

Cost-optimal energy performance levels for Member States



CONCERTED ACTION
ENERGY PERFORMANCE
OF BUILDINGS



> LEGAL document

- > Based on CEN package of standards

> GUIDANCE document

- > Informative and guiding

- > Including minimum reporting requirements



Timeline and procedure



- > Delegated Act procedure (Art 290 TFEU): Commission to develop the non-essential elements of a legally binding measure; delegation given runs until 30 June 2012
- > Consultation of national technical experts and other stakeholders in two meetings on 30 March and 6 May 2011
- > Inter service consultation closed on 3 August 2011
- > Proposal adopted by the Commission: 16 January 2012
- > European Parliament and Council can object for 2 (+2) months or revoke the delegation
- > After objection period, publication in Official Journal

Energy calculation



- > Foundation: Annex I of EPBD recast and existing CEN standards for energy calculation
- > National energy performance calculation may be based on national standards (provided they are in line with Annex I of EPBD)
- > Primary energy factors set at national level
- > On site RES production shall be deducted from the energy consumption

Cost-optimal framework



- > Net present value concept in EN 15459, with adjusted definitions and calculation
- > **Commission determines** starting year, cost categories, calculation period, defines term reference building and sets rules for selecting measures/packages
- > **MS determine** estimated economic lifecycle, cost input data, discount rate, reference buildings and select measures/packages, climate data
- > Sensitivity analysis to be part of the calculation

Regulation



- > Cost-optimal benchmarks are to be calculated for both macroeconomic (societal) and microeconomic (private) level - but still MS prerogative to decide which perspective will be the final national benchmark
- > Macroeconomic calculation level includes “costs of greenhouse gas emissions”, excludes taxes and subsidies
- > MS shall determine the discount rate in the macroeconomic calculation level after having performed a sensitivity analysis with at least two different rates, one of which shall be with 3%

Steps of the methodology

1. Selection of reference buildings/systems
2. Establishment of sets of energy efficiency measures/packages/variants
3. Calculation of the energy performance
4. Calculation of the life cycle costs using net present valuation. Result is cost-optimal set of measures for optimising energy performance of a reference building in a given MS, in kWh/m² per year
5. Report to Commission on calculations and input data used
6. Comparison of results with current building codes →if needed then adjustment!

First report to Commission 30 June 2012



Key features



Number of reference buildings

MS has to establish at least 9 reference buildings (1 for new and 2 for existing buildings for single residential, multi-residential and office buildings)

Number of measures/packages/variants

No minimum number, but guidance document (and JRC test run) suggests at least 10

Cost categories

Obligatory cost categories: initial investment costs, annual cost (including energy costs, operation, maintenance and replacement)

Global cost calculation will include costs of greenhouse gas emissions for macroeconomic calculation

Cost-optimum procedures

CoreTheme 4 in CA EPBD III



A Working Group (WG) in Concerted Action EPBD 2 called "Cost-optimum procedures" was created in December 2010

Hans Erhorn & Heike Erhorn-Kluttig (Germany), Roger Hitchin (UK), Bart Poel (The Netherlands), Søren Aggerholm, Kim Wittchen & Kirsten Engelund Thomsen (DK)

Cost-optimal levels for energy performance requirements

Report available on: <http://www.epbd-ca.org> or
<http://www.buildup.eu/publications>

Results from the WG



- > Comparative framework can be a powerful instrument to guide MS and improve their energy requirements
- > Too rigid comparison methodology can have a negative effect on setting national requirements
- > To define reference buildings there is a distinction between new and existing buildings
- > The reference buildings shall become as representative as possible for the national building typologies and changes in building tradition

Reference buildings (existing)



- > There is hardly any experience in setting up reference building for the existing stock
- > In many cases there is no sound statistical bases for “reference buildings”
- > Should we create realistic buildings that are recognisable or should we focus on simplified schematic buildings reflecting some basic characteristics
- > How do we take into account the actual energy performance of the building (element) when applying measures