

# Assessing cost-optimal levels within the new Energy Performance of Buildings Directive



## Short introduction to methodology and challenges

*Presented by:*

### ***The Buildings Performance Institute Europe***

*The Buildings Performance Institute Europe (BPIE) is dedicated to improving the energy performance of buildings across Europe, and thereby helping to reduce CO<sub>2</sub> emissions from the energy used by buildings.*

*Its mission is to support the development of ambitious, yet pragmatic building related policies and programmes at EU and Member State level and to drive their timely and efficient implementation by teaming up with relevant stakeholders from the policy and research community, the building industry and consumer bodies.*

*Created in 2010, BPIE is a not-for-profit organisation under Belgian law.  
[www.bpie.eu](http://www.bpie.eu)*

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## Political background

Buildings are the biggest single contributor (about 36%) to European CO<sub>2</sub> emissions that amount to approximately 5 gigatonnes (Gt)<sup>1</sup>. Reaching the declared long-term target of reducing greenhouse gas (GHG) emission levels by 80–95% by 2050 will therefore need a major effort to improve building energy efficiency.

This is why defining minimum energy performance requirements for new and existing buildings represent a key element in European building codes. The European Commission has introduced requirements to set such standards in all Member States through the 2002 Energy Performance of Buildings Directive (EPBD) but did at that time not give guidance on the desired ambition level.

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<sup>1</sup> For all sectors.

The recast of the EPBD in 2010 now includes a provision that national energy performance requirements should be set with the view to achieving cost optimum levels by applying a harmonised calculation methodology (Directive 2010/31/EU, article 5 and Annex III a).

The Commission requests Member States to use and apply this methodology to calculate the required cost-optimal levels for their specific country and compare them with the national requirements they have set in their national building regulations.

The present flyer aims to raise awareness and create interest for this upcoming exercise.

*A longer, more detailed document has been developed (PDF available at [www.bpie.eu](http://www.bpie.eu)) to support the process, to cope with its ambitious timeline and to facilitate the correct and consistent understanding of all stakeholders involved in this process.*

## Cost-optimal energy performance

The new methodology links energy performance requirements to economic targets. This methodology supports the objective of minimising costs during a building's lifecycle, while maximising environmental benefits. Rising energy prices offer even more scope for improving current regulations, as the cost savings from reduced use of energy are higher and can justify higher upfront investments.

The methodology combines uniform calculation rules with national data to ensure a fair treatment of Member States' national conditions. The economic calculations will also foster competition; they are neutral regarding technologies and do not favour certain products or techniques.

The definition of reference buildings and technology packages is a crucial part of the process as they impact directly on the assessment and on the possibility of finding the true cost-optimal solutions that will allow the proper benchmarking levels to be compared with existing and planned national minimum energy performance requirements.

**Assessment at Member State level:** The Commission provides the general methodology and will also take care of joint issues and common input data, e.g. long-term international energy price developments.

Applying this methodology, Member States assess all the input data (e.g. climate conditions and investment costs) and calculate the results. The methodology and local data will then allow Member States to identify cost-optimal levels of minimum energy performance requirements for new and existing buildings. They should also compare the results of this calculation with their minimum energy performance requirements that are currently in effect or planned.

**Monitoring and reporting:** Member States must report their calculation results to the Commission, accompanied by the input data and assumptions made for these calculations. This needs to happen at regular intervals at least every five years, (first report due by June 2012). If the results demonstrate that the current minimum energy performance requirements are significantly less energy efficient (by more than 15%) than what has been identified as cost-optimal, the Member State need to provide a justification for this difference. If this difference cannot be justified, the respective Member State will be asked to develop a plan, outlining appropriate steps to reduce this gap.

The Commission will publish a report on Member States' progress in reaching cost-optimal levels of minimum energy performance requirements.

## The principle of cost-optimal requirements

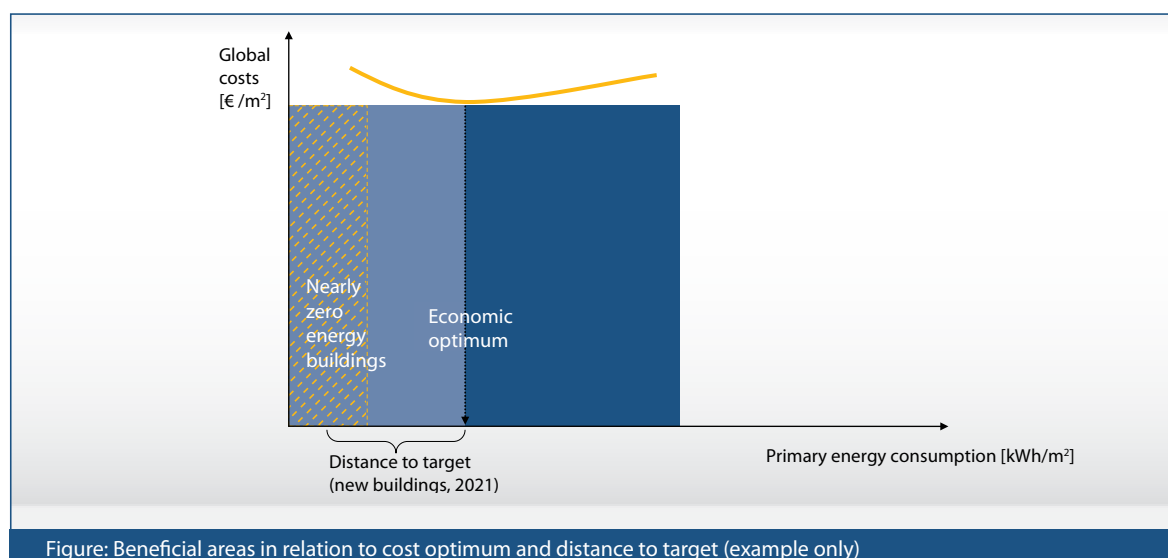
The EPBD recast requires the Commission to establish a comparative methodology by 30 June, 2011.

**Analysing economic and environmental benefits:** Regarding the costs of energy performance requirements, the EPBD recast prescribes that the whole lifecycle should be considered and not just the up-front investment. The cost-efficiency of different packages of measures (combinations of compatible energy efficiency and energy supply measures) can now be assessed by calculating and comparing the energy-related lifecycle costs.

**Defining the optimum from the cost curve:** From the variety of results, a cost curve can be derived. The lowest part of the curve represents the economic optimum for a combination of packages.

**Setting of minimum performance requirements:** The minimum energy performance requirements are represented by the area of the curve that delivers the lowest cost for the end-user/company. These requirements could prove to be more efficient than current requirements, at less or equal cost.

In the figure below, the area of the curve to the right of the economic optimum represents solutions that underperform in both aspects (environmental and financial). To prepare for higher energy targets, certain Member States might choose stricter requirements than the economic optimum (left area of the curve). In this graph, the distance to target for new buildings, so they are nearly zero-energy buildings as from 2021, is made visible.



*If packages create very similar costs, the package with the lower energy use should be selected. This package will lead to higher environmental benefits and reduce fuel dependence.*

## Benefits and outlook

### Benefits of the methodology

The EPBD recast requests that cost-optimal levels for minimum energy performance requirements incorporate a holistic lifecycle approach for buildings. The methodological approach is unbiased towards different technologies and delivers transparent results. National circumstances can be taken into account to ensure fair treatment of Member States. The process can be performed at low administrative cost.

### Exchange of experience

The assessments across Europe will provide a clear picture of the current situation and potentials if cost-optimal levels are applied. The exchange of national information will create a common understanding of opportunities and challenges regarding minimum requirements. The knowledge will provide guidance and drive the update of existing national building regulations.

### Further development and challenges

Alongside the basic framework of the methodology, further details are to be developed, for example:

- The Commission needs to provide guidance on energy price forecasts and their updates;
- The distinction between private and societal perspectives needs further elaboration;
- In addition, CO<sub>2</sub> emissions could be a useful additional indicator for comparison with greenhouse gas reduction targets.

*In this process of defining and agreeing on all the details of the methodology, it is very important that Member States and all other stakeholders are actively involved. This ensures that the different perspectives are taken into account to make the methodology a powerful tool for promoting smart and efficient buildings in Europe.*

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