

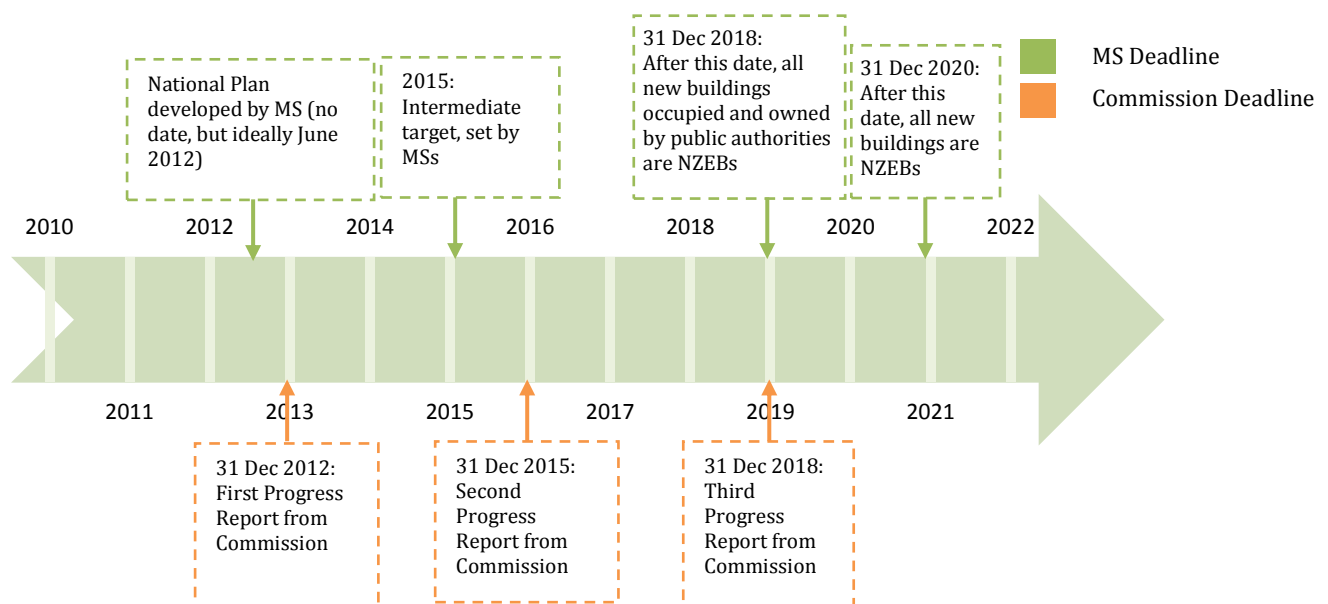
Factsheet on Nearly Zero-Energy Buildings

Other factsheets in toolkit: Cost-Optimality, Finance, Energy Performance Certificates, Training

Why Nearly Zero-Energy Buildings (nZEB)?

The overall objective in setting a target for nZEB is to ensure that new buildings do not place an additional strain upon energy resources, nor add to carbon emissions. Given the very significant impact of buildings on energy use within the EU, it makes sense to ensure that new buildings are constructed as efficiently as possible. The learning that will be achieved through the creation of nZEB will be of value to the additional challenge of turning the existing stock into nZEB, creating new skills, stimulating innovation, and driving down costs.

Description



Article 9 of the EPBD Recast requires that:

- by 31st December 2020, all new buildings are nearly zero- energy buildings; and
- after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

Article 2 defines a ‘nearly zero energy building’ (nZEB) as “a building that has a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.”

Member States must create a ‘national plan’ for increasing the number of nZEB (including existing buildings) that covers the steps and policies that will be required to meet the targets. The plans must include:

- A nZEB **definition** that includes a primary energy indicator in kWh/m²
- **Intermediate targets** for the energy performance of new buildings by 2015
- Details of the policies and measures adopted to **promote nZEB**, both new and existing

No deadline is given for the submission of these plans, but the Commission was due to publish a progress report by the end of 2012. The Commission Report published in July 2013 by which time 14 Member States had submitted their reports. In its report, the Commission highlights that none of the country reports are complete with either a practical definition of nZEB or an intermediate plan for 2015 missing. Non-compliant Member States are to be urged to submit their plans as soon as possible so as to complete the EU-wide picture on nZEB. Progress reports will be issued by the Commission every three years.

Key issues

The key issues for the most effective use of the nZEB elements of the Directive are the definition of nZEB adopted by Member States, and the ambition and urgency of the national plans.

Definition

The Directive does not clearly define what a 'nearly zero energy building' is, either for new build or for the refurbishment of existing buildings¹. Exactly what is meant by 'nearly zero or very low amount of energy required' and what constitutes a 'very significant' proportion of this energy to be met by renewable sources is left to national definitions. The Directive also states that renewable sources include energy 'produced on-site or nearby', but it does not specifically require that all renewable energy is generated on site or nearby.

There will be flexibility for Member States to define nZEB in different ways. **It is important that the definitions adopted are as ambitious as practically possible.** They should include the lowest heating and cooling demands – ideally matching the PassivHaus standard (maximum heating demand of 15 kWh/m²/year), with required energy use covered by on-site or nearby renewables. Within the definition energy demand from heating, cooling, ventilation, hot water and lighting must be accounted for. The more areas of energy use that are covered by the definition (e.g. appliances), the tighter the energy efficiency standards will need to be in order to meet the nZEB definition. As Exhibit A² illustrates a selection of existing targets set by Member States.

National Plan

The Directive requires that Member States produce a 'national plan' that sets out an nZEB definition, an intermediate 2015 target, and the policies and mechanisms that will be used to meet the 2018/2020 targets. No deadline for the submission of the plan is given.

Exhibit A – NZEB targets²

Norway: Passivhaus standards by 2017

Finland: Passivhaus standards by 2015

France: By 2020 new buildings are energy-positive

Ireland: Net zero energy buildings by 2013

Germany: New buildings are energy-neutral by 2020

Denmark: Energy for heating, cooling, ventilation and hot water limited to 20 kWh/m²/year by 2020

UK: New homes to be 'Zero Carbon Homes' by 2016.

Belgium: All new buildings in the Brussels Capital Region to be PassivHaus standard by 2016

¹ The Buildings Performance Institute Europe (BPIE) is currently undertaking a comprehensive study on principles for nearly zero-energy buildings. This is designed to provide guidance to national and EU policy makers and to all the key stakeholders involved in the implementation of NZEBs across the EU. The study should be available in November 2011. For more information, go to www.bpie.eu/nearly_zero.html.

² Commission (2009) *Low Energy Buildings in Europe: Current State of Play, Definitions and Best Practice*; ec.europa.eu/energy/efficiency/doc/buildings/info_note.pdf

The Commission was required to report on progress to the 2018/2020 target by the end of 2012, but the report has not yet been published (July 2013). The delay in preparing the report has partly been due to the small number of national reports submitted by the end of 2012 (just 9). Establishing the nZEB definition, intermediate targets, and supporting measures as early as possible will be helpful to industry, giving it sufficient time to adapt and prepare for future standards. An ideal solution would have been for national plans to be submitted alongside the methodology for calculating cost-optimal improvements, required by 30 June 2012, but this was not done.

National Plans should provide measures to ensure that the 2018 and 2020 targets are met in practice as well as on paper. A key risk of early announcement of tighter building codes has been identified in a number of Member States in which hugely increased numbers of building permissions are applied for preceding a tightening of standards. In these instances construction work is started to the extent required to prevent the permission from expiring but significant works and completion of the building extends into the new or even subsequent regimes, but built to now vastly out-dated performance standards. If not addressed, there is a risk that new buildings built after 2018/2020 will perform to lower than nZEB standards.

No guidance is given on the level of the targets required, but it is obviously better to set ambitions as high as possible from the outset. The Commission will review the national plans and make a recommendation where necessary.

Cost-optimality

The Directive links the 'cost-optimal' methodology (see Factsheet on Cost-optimality) to both the existing stock and new build. Differences between the two types of building are allowed within the comparative methodology framework.

New buildings are constructed within the context of carbon reduction targets, energy security concerns, and a drive to reduce energy demand. Cost-optimality calculations for new build should account for this context and should value benefits beyond immediate energy savings. Carbon savings, avoided generation capacity, impact from learning curves and new innovation should all be included within the comparative methodology framework for new build. This has particular relevance for nZEB.

The cost-optimal methodology is to be used to guide the minimum level of renovation requirements and should not be used to dilute the definition of nZEB. Member States are allowed to apply stricter requirements than what the cost-optimal methodology will show.

Exhibit B – UK- Early setting of intermediate targets:

In 2006 the UK set a target for all new homes to be 'Zero Carbon Homes' by 2016. This ten year target was accompanied by interim targets, with Part L of Building Regulations requiring a reduction in CO₂ emissions from the 2006 standard by 25% in 2010 and 44% in 2013. However, the UK approach has been criticized for a weak definition which excludes emissions from appliances and allows some of the carbon reduction to be met through activity away from the development. The UK's Committee on Climate Change reported in 2011 that the weakening of this definition [from including to excluding energy use from appliances] would "require up to an additional 6 TWh of electricity which would have to be met by low carbon electricity generation³."

³ Committee on Climate Change (2011) *Meeting Carbon Budgets – 3rd Progress Report to Parliament*, p. 121; hmccc.s3.amazonaws.com/Progress%202011/CCC_Progress%20Report%202011%20Single%20Page%20no%20bu%20tons_1.pdf

Resources

Guides to Nearly Zero-Energy Buildings

1. **Commission (2013):** Own report and country reports are available at:
http://ec.europa.eu/energy/efficiency/buildings/implementation_en.htm
2. The **Buildings Performance Institute Europe** (BPIE, www.bpie.eu) released a report on nZEB in November 2011. It has also issued country-specific reports on nZEB. For more information:
www.bpie.eu/pub_principles_for_n_zeb.html
3. **Commission of the European Communities** (2008) *Proposal for a Recast of the Energy Performance Of Buildings Directive - Impact Assessment*;
ec.europa.eu/energy/strategies/2008/doc/2008_11_ser2/buildings_impact_assesment.pdf
4. **Danish Building Research Institute** (2008) *European national strategies to move towards very low energy buildings*;
www.euroace.org/PublicDocumentDownload.aspx?Command=Core_Download&EntryId=107
5. **Danish Building Research Institute** (2009) *Towards very low energy buildings: Energy saving and CO₂ emission reduction by changing European building regulations to very low energy standards*;
www.euroace.org/PublicDocumentDownload.aspx?Command=Core_Download&EntryId=106
6. **ECEEE** (2011) *Steering through the Maze #2 - Nearly zero energy buildings: achieving the EU 2020 target*;
www.eceee.org/buildings/Steering-2-zeroBuildgs.pdf
7. **EPBD Concerted Action: Building Energy Performance under the EPBD – Taking Stock and Looking Forward**
<http://www.epbd-ca.eu/archives/610>

Basic guides to the EPBD recast

Accessible, short and direct guides to the new EPBD and some of the key questions around the recast:

- **ECEEE** (2010) *Steering through the Maze 1 Your guide to the EPBD recast*;
www.eceee.org/buildings/Mazeguide1_EPBDrecastRev090310.pdf
- **ECEEE** (2010) *Steering through the Maze 3 Your guide to FAQs on the EPBD recast*;
www.eceee.org/buildings/Mazeguide3-FAQ-EPBD.pdf