



Better Energy Performance of Buildings in the European Union

Eszter Kantor
Louis Fredricks
03/2015
MR-146

Summary

Improving the energy efficiency of buildings is seen as a way to reduce EU energy consumption and to lower CO2 emissions. Furthermore, improved energy efficiency of buildings (this includes insulation, lighting, heating etc.) can help the European Commission in achieving its target of 20% energy savings by 2020. The European Commission adopted the Energy Performance of Buildings Directive (EPBD) in 2006. It sets minimum standards for the energy use of buildings in every Member State and introduces a certificate as a way to inform buyers or tenants of the energy performance of buildings. This Directive was reviewed and updated in 2010 broadening its scope and setting more ambitious goals.

The key goals of the revised [EPBD](#) are:

- Energy performance certificates need to be included in all advertisements for the sale or rental of buildings;
- EU countries must establish inspection schemes for heating and air conditioning systems;
- all new buildings must be nearly zero energy buildings by 31 December 2020 (public buildings by 31 December 2018);
- EU countries must set minimum energy performance requirements for new buildings, for the major renovation of buildings and for the replacement or retrofit of building elements (heating and cooling systems, roofs, walls, etc.);
- EU countries have to draw up lists of national financial measures to improve the energy efficiency of buildings.

What is the directive about?

The Energy Performance of Buildings Directive covers energy needs for the heating of premises, the production of hot water, cooling, ventilation and lighting for new and existing buildings, whether they are residential or not. Key changes in the revised Directive include:

- Extension to all buildings (irrespective of m² floor area) of requirement to set minimum energy performance levels when a major renovation takes place;
- All new buildings to be nearly zero energy level by December 2020 (December 2018 for public authority buildings);
- Requirement for Member States to list financial incentives in place to enable the transition towards nearly zero energy levels in buildings;
- Mandatory energy certification for all properties constructed, sold or rented out, and for all public buildings over 500m² or those frequently visited by the public;
- Enhanced heating and cooling system inspections and reporting requirements; and

- Requirement for Member States to establish penalties for non-compliance.

In March 2012, the European Commission (delegated act 244/2012) established a comparative methodology framework for calculating cost-optimal levels for buildings and building elements. Member States are required to use this methodology to calculate the cost-optimal levels of minimum energy performance requirements using reference buildings to represent the typical and average building stock in that country. Moreover, Member States are required to compare the results of these calculations with the minimum energy performance requirements currently in force. The results of the calculations and all input data and assumptions used must be submitted in a report to the European Commission every five years. National reports can be found here: <http://www.epbd-ca.org>.

For information on specific progress made by Member States and on national enforcement measures, please contact the U.S. Commercial Service located in those specific markets (www.export.gov).

State of Play and Future developments

To support EU countries and to provide a platform of information exchange, the Commission launched the [Concerted Action \(CA\) EPBD](#). The main objective of the CA EPBD is to assist the Member States in transposing and implementing Directive 2010/31/EU. Implementation and enforcement of the EPBD differs country-by-country.

In Italy, for example, regions have the power to set targets and create certificates for EPBD compliance. Germany and Scandinavian countries are ahead in setting targets, requiring higher energy performance through use of green technologies. The trend is towards zero energy using buildings. Progress is most obvious in new buildings, but not equally throughout the EU. Member states offer various incentives, and green procurement is being considered as a tool to foster use of green technologies.

Related to the EPBD Directive is the Energy Efficiency Directive (EED2012/27/EU) which was transposed by all Member States by the beginning of June 2014. The EED Directive establishes a common framework of measures for the promotion of energy efficiency within the Union in order to ensure the achievement of the Union's 2020 20 % target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date. It lays down rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020. For more information, visit <http://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive>.

Finally, one should keep in mind [Regulation 305/2011](#) or the [Construction Products Regulation \(CPR\)](#). It lays down harmonized conditions for the marketing of construction products and replaces the repealed Construction Products Directive (89/106/EEC). The CPR is designed to ensure that reliable information is available on construction products and that it is relatable to their performances. This is achieved by providing a "common technical language," offering uniform assessment methods of the performance of construction products. The provisions of the new Regulation seek to:

- Clarify the affixing of CE marking to construction products for which the manufacturer has made a declaration of performance.
- Introduce simplified procedures enabling cost reductions for businesses, especially SMEs.
- Impose stricter designation for organizations responsible for assessing the performance of construction products and verifying their consistency

What does EPBD mean for U.S. manufacturers of construction products and services?

The majority of construction products sold on the EU market are subject to the Construction Products Regulation (the CPR) 305/2011. To comply with this regulation, manufacturers of building products that are permanently installed have to use mandatory harmonized standards. Where relevant, these mandatory EU wide standards already address energy performance, for instance "U-values" for windows. The performance is rated and mentioned along with the CE marking. From 1 July 2013, it became mandatory for manufacturers to apply CE marking to any of their products which are covered by a harmonized European standard (hEN) or European Technical Assessment (ETA).

Building products which are outside of the scope of the construction products directive also carry CE marking, but not as construction products. They are covered by other CE marking directives which address safety and energy efficiency. Safety, for instance, is covered by the machine safety, low voltage or electromagnetic compatibility directives, as the case may be. Energy efficiency is addressed in a series of implementing measures to reduce energy consumption of "energy using products" such as boilers, air-conditioners, pumps, among others (for more details see our website <http://www.export.gov/europeanunion/>- under 'Energy Related Products').

U.S. architects and building contractors promoting and selling their projects in the EU would have to include detailed calculations on energy performance in accordance with the requirements of the EPBD and additional national requirements. U.S. manufacturers of log home kits, for instance, would have to calculate and demonstrate energy performance of their chalets in addition to showing compliance with the CPR. Using the standards to calculate performance would be an advantage as member states are likely to refer to them.

Importance of standards

One of the key elements of the EPBD is the calculation methodology, which has been addressed in EU wide standards, mandated by the Commission and drafted by the European standards organization CEN (www.cen.eu). According to the mandate, the standards should cover:

- energy demand for heating, cooling and ventilation of a building
- energy efficiency of heating, cooling and ventilation systems including integrated building automation and energy management
- lighting
- primary energy use, environmental impact and energy performance certificate
- a comprehensive description of the calculated methodology

It is expected that the use of these standards will increase the accessibility, transparency and objectivity of the energy performance assessment by facilitating the comparison of best practices and supporting the internal market for construction products. This development is based on an earlier developed set of EPB standards published in 2007-2008. This earlier set of 42 EPB standards consists of 30 EN (European) and 11 ISO (EN-ISO) standards. The current initiative (2012-2015) is to review and revisit this set of (2007-2008) EPB-standards and reformulate and add standards so that they become on the one hand unambiguous and compatible, and on the other hand a clear and explicit overview of the choices, boundary conditions and input data that need to be defined at national or regional level.

The EN standards are available from the national European standards organizations or through regular standards suppliers in the U.S. Some of the key standards - in numerical order - are:

- EN 832 – Thermal performance of building – Calculation of energy use of heating - Residential buildings.
- EN/ISO 13790 - Thermal performance of buildings – Calculation of energy use for space heating and cooling.
- EN 15217 – Energy performance of buildings – Methods for expressing energy performance and for energy certification of buildings (format of energy certificate is in the Annex).
- EN 15240 – Ventilation of buildings – Energy performance of buildings – Guidelines for inspection of air-conditioning systems.
- EN 15251 – Criteria for the indoor environment including thermal, indoor air quality, light and noise

The complete list can be found on CEN’s website (see link under “useful websites”).

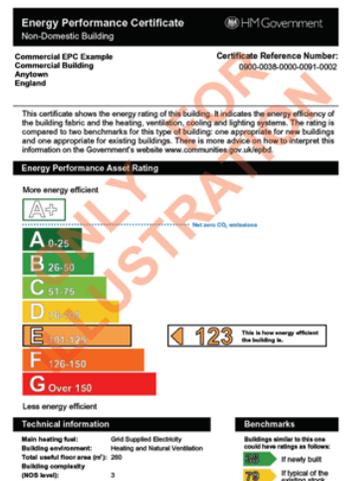
EU standards development only allows U.S. manufacturers based in the EU to participate directly. Manufacturers who do not participate in European standardization will have to pay attention when draft standards are published. Once the public inquiry period of the draft standard is closed, it is not possible to comment further on the draft standard.

Frequently Asked Questions

Is there a link between U.S. RESNET building certification and EPBD?
Not really. In the U.S., a comparable assessment and certification system known as Residential Energy Services Network (<http://www.resnet.us/>) exists, but there is no equivalency with EU requirements. The use of standards may be similar, but the certificate is different.

Energy Performance Certificate (EPC)

Countries in the EU are obliged to label all public authority buildings and properties bought, sold or rented for their efficiency standards under the (EPBD), so providing information about the likely range of future energy bills. EPC’s must contain details of the performance of the building or building unit and they must give reference values so that owners and tenants can compare performance with other buildings. They must also include more advanced recommendations for



improving the building's energy performance. These should include specific building elements to be improved as well as major renovations comprising multiple building elements and building systems.

LEED certification

LEED is a green building certification program developed by the U.S. Green Building Council. The certificate is based on third-party verification. The focus is on energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. LEED certification does not mean compliance with the EPBD. It is likely that LEED exceeds EPBD because LEED's scope is broader than EPBD. (<http://www.usgbc.org>)

Useful websites

Legislation:

http://ec.europa.eu/energy/efficiency/buildings/buildings_en.htm

<http://www.buildup.eu/>

<http://ukbcsc.org.uk/>

National Reports:

<http://www.epbd-ca.org/>

Where to buy standards:

<https://www.cen.eu/work/findYourWay/buyingENs/Pages/default.aspx>

<http://global.ihs.com/>

Stakeholder Network:

<http://www.buildup.eu/partners>

air filtration: <http://www.aivc.org/> , <http://www.inive.org/>

For More Information:

The U.S. Commercial Service at the U.S. Mission to the European Union is located at Boulevard du Regent 27, Brussels BE-1000, Belgium, and can be contacted via e-mail:

<http://www.export.gov/europeanunion/contactus/index.asp> or by visiting the website:

<http://www.export.gov/europeanunion/>.

For more information on CE marking contact Louis.Fredricks@trade.gov.

For more information on (renewable) energy contact Eszter.Kantor@trade.gov.

To know more about standards in the EU, please read our market research report on Standards and Product Certification in the European Union:

http://buyusainfo.net/docs/x_7938919.pdf.

One can locate the nearest U.S. Export Assistance Center or Commercial Service offices throughout Europe by visiting www.buyusa.gov and <http://export.gov/europe/>.

To the best of our knowledge, the information contained in this report is accurate as of the date published. However, The Department of Commerce does not take responsibility for actions readers may take based on the information contained herein. Readers should always conduct their own due diligence before entering into business ventures or other commercial arrangements. The Department of Commerce can assist companies in these endeavors.

INTERNATIONAL COPYRIGHT, U.S. DEPARTMENT OF COMMERCE, 2015. ALL RIGHTS RESERVED OUTSIDE OF THE UNITED STATES.