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EU Building Energy Performance Standards

Paolo Bertoldi

Senior Expert

European Commission Joint Research Centre

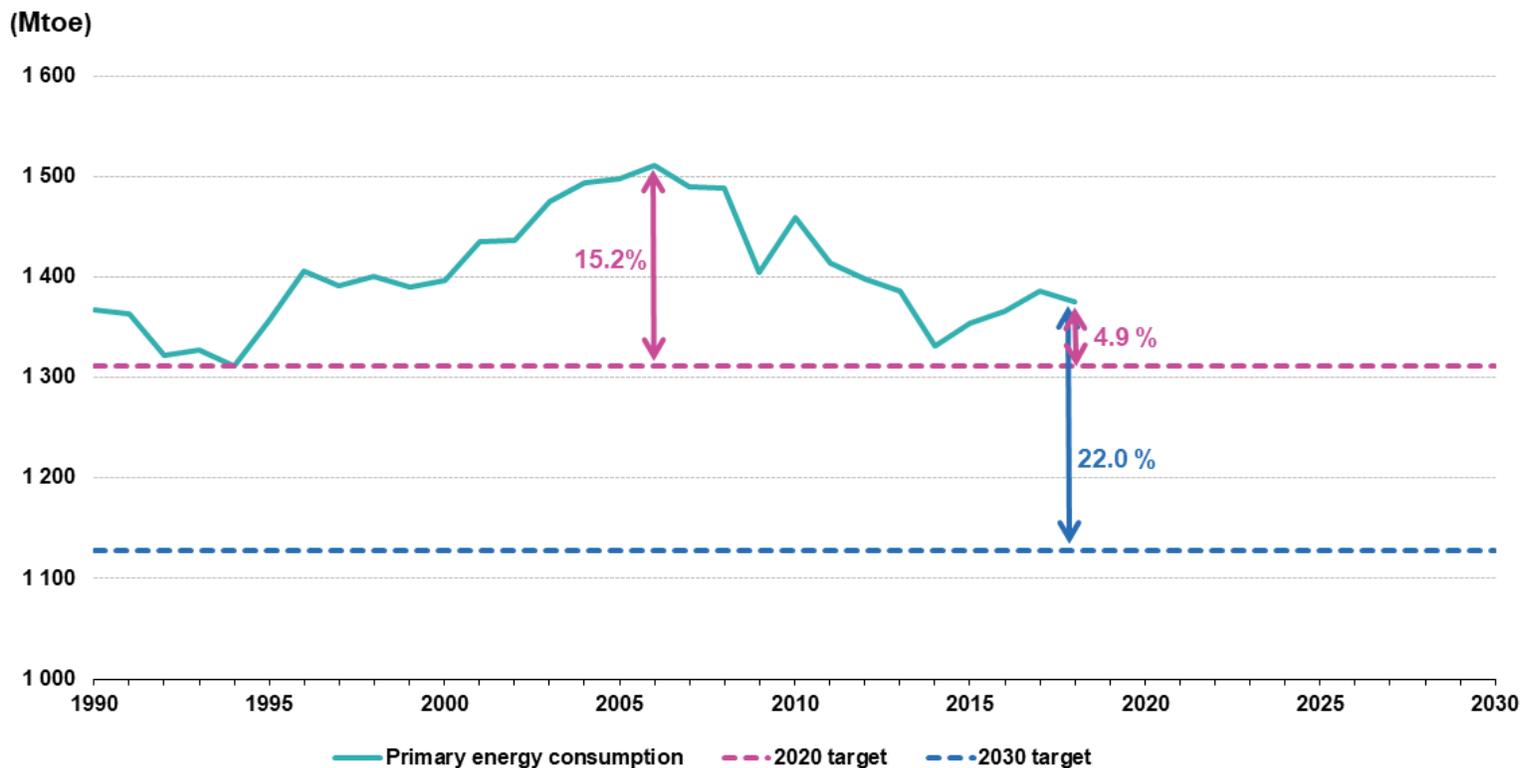
EU Climate Targets

- The EU submitted its long term strategy to the UNFCCC in March 2020, committing to **climate neutrality by 2050**.
- Climate neutrality by 2050 is in line with the Paris Agreement goals to keep climate change below 2°C while pursuing efforts to keep it below 1.5°C
- Commission proposed on 4 March 2020 a Climate Law, to enshrine this EU target legally. It established a climate trajectory to climate neutrality by 2050.
- Commission proposes recently to increase the GHG emission reduction target for **2030 from 40% to 55%** (compared to 1990).

EU 2030 Energy Efficiency Targets

- Energy Efficiency target for 2030 set at 32.5% compared to the BaU scenario

Distance to 2020 and 2030 targets for primary energy consumption, EU-27



- Buildings are responsible for around **40% of energy consumption** and **36% of greenhouse gas emissions in the EU.**
- 75% of existing buildings are energy-inefficient..

Main EU policies for Energy Efficiency in Buildings

- Energy Performance of Buildings Directive (started in 2002, last amended in 2018)
 - Building standards for new and existing buildings, from 2021 all new buildings must be nZEBs; Energy Performance Certificates; national Long Term Renovation Strategies; Smart buildings; Financing
- Energy Efficiency Directive (started in 2012, last amended in 2018)
 - National Energy Companies Obligations; renovation of Central Gov. Buildings; Audits; Smart Metering; Energy Performance Contracting; Financing
- Ecodesign Directive (started in 2005, last amended in 2009)
 - Most of building technical equipment and appliances are now covered
- Governance Regulation (2018)
 - National Energy and Climate Plans (before NEEAPs under EED)

EPBD Main Principles

- Establishes an EU common methodology for calculating the energy performances of buildings, e.g. kWh/m² year, to meet a certain level of services in the buildings.
- Based on the common methodology, it requests to MSs to adopt energy performance standards.
- Based on the common methodology establish an Energy Performance Certificate (EPC) for buildings sold or rented.
- Regular inspection of boilers and HVAC systems.

Energy Performances

'Energy performance of a building' means the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting;

EPBD Building requirements

EU MSs shall adopt minimum requirements to the energy performance of:

- new buildings and new building units ;
- existing buildings, building units and building elements that are subject to major renovation;
- building elements that form part of the building envelope and that have a significant impact on the energy performance of the building envelope when they are retrofitted or replaced;
- technical building systems whenever they are installed, replaced or upgraded;

EPBD Building requirements - Cost Optimality

- 'Cost-optimal level' is the energy performance level which leads to the lowest cost during the estimated economic lifecycle taking into account energy-related investment costs, maintenance and operating costs (including energy costs and savings).
- Minimum energy performance requirements for buildings or building units are set with a view to achieving **cost-optimal levels**. Cost-optimal levels shall be calculated in accordance with the comparative methodology.
- Different requirements between new and existing buildings and between different categories of buildings.
- Minimum energy performance requirements are set for building elements that form part of the building envelope and that have a significant impact on the energy performance of the building envelope, when they are replaced or retrofitted, with a view to achieving cost-optimal levels.

EPBD Building requirements New Buildings

MSs shall ensure that, before building construction starts, the **technical, environmental and economic feasibility of high-efficiency alternative systems** is considered and taken into account:

- decentralised energy supply systems based on energy from renewable sources;
- cogeneration;
- district or block heating or cooling, particularly where it is based entirely or partially on energy from renewable sources;
- heat pumps.

EPBD Building requirements existing buildings

- When a building undergoes **major renovation**, the energy performance of the building or the renovated part shall meet minimum energy performance requirements.
- When a building element part of the building envelope having a significant impact on the energy performance of the building envelope, is retrofitted or replaced, **shall meets minimum energy performance requirements.**
- Also building renovation shall take into account of high-efficiency alternative systems, as described in the previous slide.

EPBD Building requirements Technical Equipment

MSs shall set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the **technical building systems** which are installed in existing buildings.

Member States may also apply these system requirements to new buildings.

The system requirements shall cover at least the following:

- heating systems;
- hot water systems;
- air-conditioning systems;
- large ventilation systems;

Member States encourage the introduction of **intelligent metering systems**, the installation of **active control systems** such as automation, control and monitoring systems that aim to save energy.

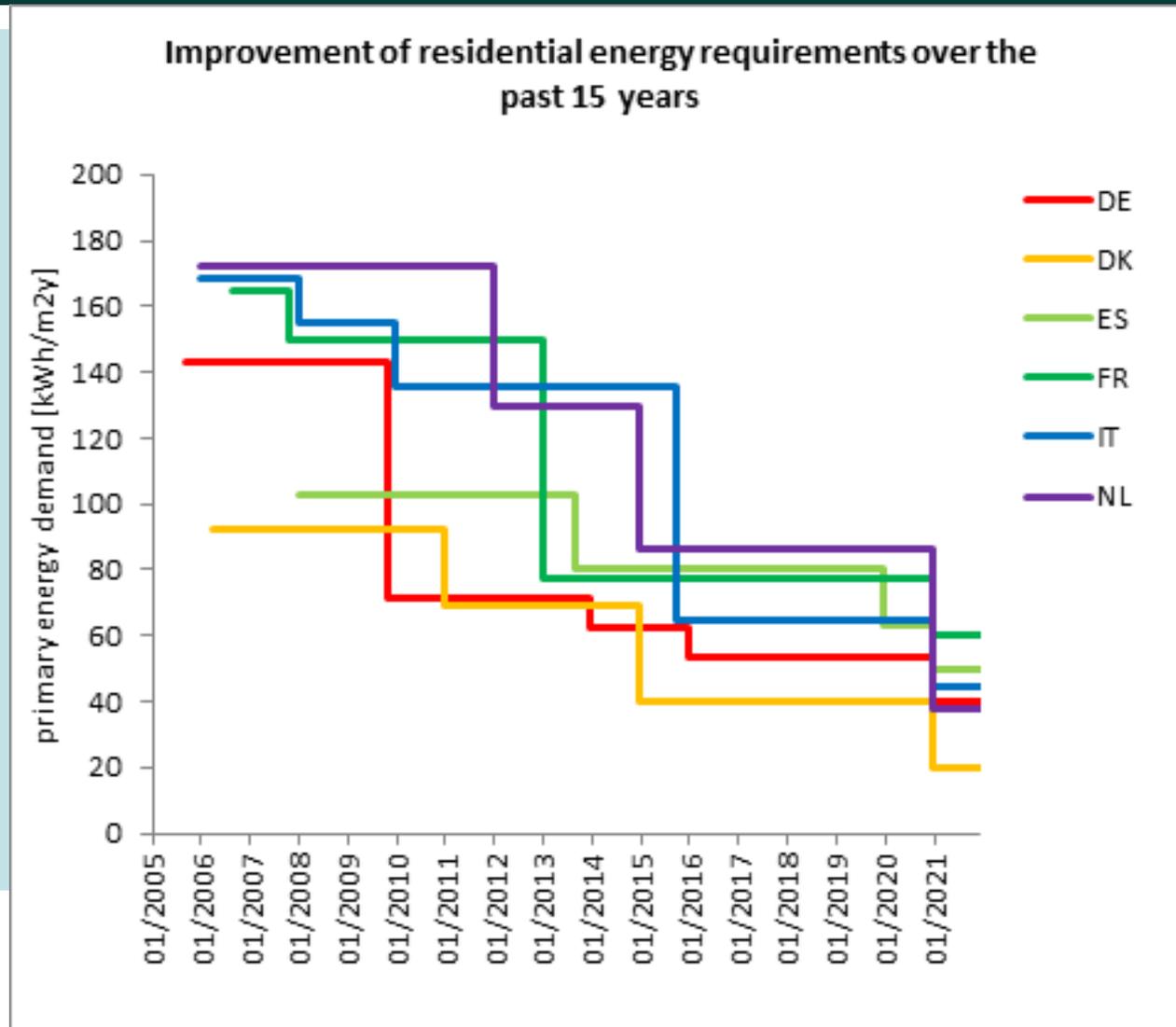
EPBD Building requirements Nearly zero-energy buildings

Definition:

'nearly zero-energy building' means a building that has a very high energy performance, as determined in accordance with Annex I. 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;

By 31 December 2020, all new buildings shall be nearly zero energy buildings; for new buildings occupied and owned by public authorities are nearly zero-energy buildings the deadline was 31 December 2018.

Impact of the EPBD



Building Renovation Wave

- **Existing buildings** are the major part of the building stock, many built before any building code or performance standard was in place, hence poor energy performances. Many of these building will be still in place by 2050.
- **Energy renovation** is around 1% per year of the existing building stock, it will take about 100 years to renovate these buildings.
- There is the urgent need to **increase the renovation wave >2%** per year and the depth of the renovation, towards NZEBs.
- The **EU Green Deal** has proposed the **Building Renovation Wave**. Key issue is removal of barriers and financing.

Conclusions

- Energy Efficiency in buildings is key for the de-carbonisation of the EU economy.
- The EU EPBD sets the frame for national building codes on energy performances of buildings.
- Building codes for new buildings are approaching NZEBs.
- To reach low energy consumption technological innovation is needed.
- Renewable energies plays an important role.

Thanks



Contact paolo.bertoldi@ec.europa.eu