

Energy efficient buildings and decarbonization of heating systems in Europe

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AGENDA

1. Energy Efficiency Directive – EED
2. Energy Performance of Buildings Directive – EPBD
3. Activities in Denmark for buildings and heating





BACKGROUND

Around 75% of the buildings in the EU is energy inefficient; about 35 % of the building stock is more than 50 years old

Yearly renovation rate is only around 1%

Rate for deep renovations (60% reduction of energy consumption) is only around 0.2% yearly

85-95% of the buildings in the EU will still exist by 2050

With the current energy renovation rate, it will take many years before the building stock is climate neutral

To reduce GHG-emission, it is necessary to look at the existing building stock now!

EED articles:

Article 5: Renovation of public buildings

Suggestion: 1.7% reduction per year (discussion about what is a public building)

Article 7: Renovation of existing buildings

Suggestion: 3% of the building stock must be converted to NZEB every year (discussion about what is a NZEB and which buildings shall be included, shall low income buildings be included?).

Article 8: Energy audits and energy management systems

Articles 9-11: Metering; billing information; cost of access to metering and billing information

Article 14: Promotion of efficiency in heating and cooling

Article 14 - Promotion of efficiency in heating and cooling

Overall objective: to encourage the identification of cost effective potential for delivering energy efficiency, principally through the use of **cogeneration, efficient district heating and cooling** and the **recovery of industrial waste heat**

Efficient heating and cooling

Efficient heating and cooling includes:

- the use of heat from **cogeneration** and **renewable energy** sources,
- recovery of **waste heat** from industrial processes to meet demand for heating and cooling,
- in general all heating and cooling options that achieve primary energy savings compared to a baseline scenario.



Energy performance of buildings directive – EBPD

Established in 2012 and revised in 2018, the EBPD will help reach the building and renovation goals set out in the **European Green Deal**. The EBPD is under revision.

The new proposal aims to reaching the target of at least 60% emission reductions by 2030 in the building sector in comparison to 2015 and achieve climate neutrality by 2050.

The main measures in the new EBPD proposal are:

- Introduction of **minimum energy performance standards** for buildings to encourage faster renovation of the worst performing buildings. It is suggested that public and non-residential buildings shall as a minimum have EPC label F by 2027 and E by 2030 and that residential buildings shall as a minimum have energy label F by 2030 and E by 2033
- More ambitious vision for buildings to be NZEB, **Net zero-Emission Buildings**
- Enhanced **National Building Renovation Plans**
- Increased reliability, quality and digitalization of **Energy Performance Certificates**; with energy performance classes to be based on common criteria in all EU member countries
- Introduction of declaration requirement to a **buildings life cycle (LCA)**
- Increased requirements for efficiency of **heating, ventilation and cooling**

Proposed changes

- New demands on digitalization and data exchange (to make it easier to exchange data)
- All new build buildings shall be Zero-emission buildings by 2030
- Introduction of a renovation passport
- A better definition of deep renovation (60% energy savings?)
- Modernization of buildings and their systems, and better energy system integration (for heating, cooling, ventilation, charging of electric vehicles, renewable energy)

The proposed revision of the directive is being considered by the Council and the European Parliament.



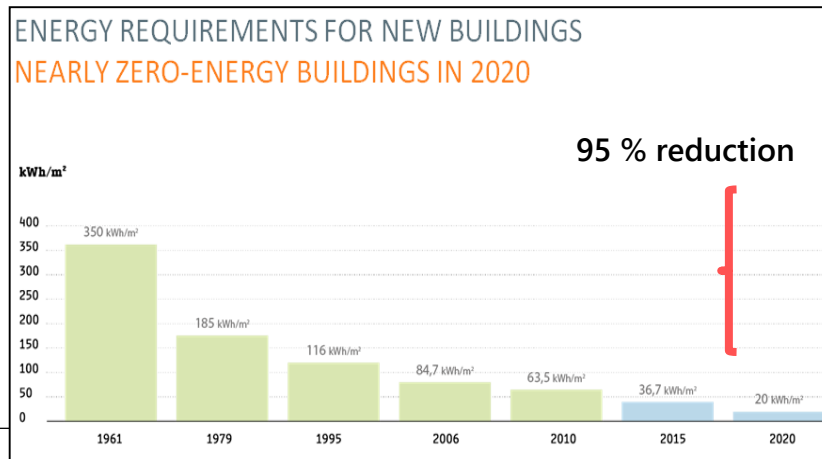
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The Development in Denmark

Energy building codes since 1961 – now both for new and existing buildings with performance based criteria (annual energy demand must be under approx. 30-40 kWh/m²), building code is revised every five year.

Next building code Jan. 2023:

LCA, embedded energy in building materials, energy for transport and construction, discussion on NZEB and deep renovation



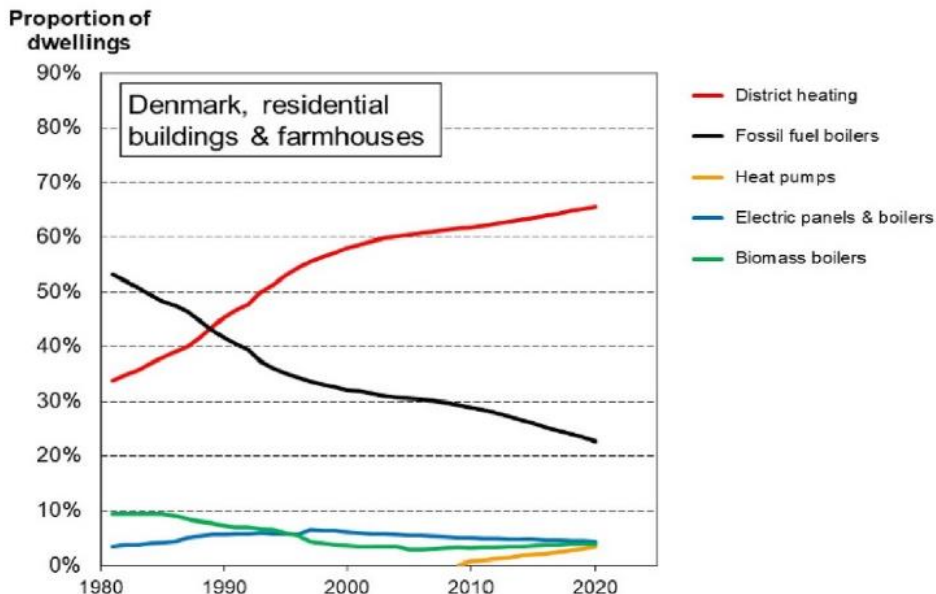
Future strategy, Denmark

- More district heating in cities
- Change oil and gas boilers to heat pumps
- New buildings are NZEB
- Increase the energy renovation of existing buildings
- Use Energy Performance Certificates even more
- Energy renovation of public buildings
- Digitalization



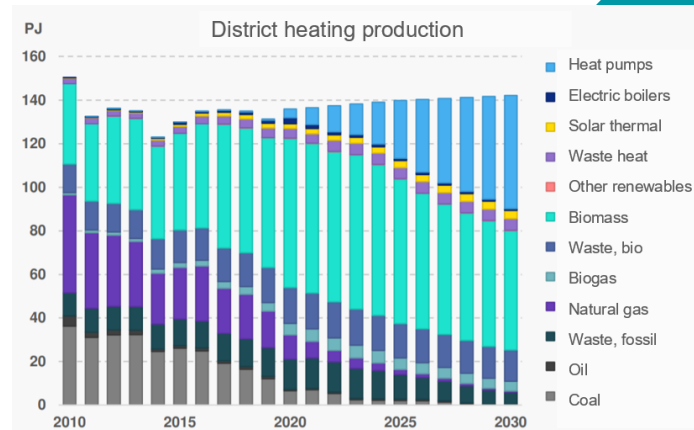
HEATING IN DENMARK

About 65% of all buildings in Denmark are connected to the District Heating Network



Outlook for district heating in 2030

- Phase out of oil, coal and natural gas for the production of district heating
- Reducing biomass
- Increasing utilization of large heat pumps in district
- Electricity for heat pumps is supplied by renewable energy (mostly wind energy)
- Analyzing the use of geothermal energy





Thank you
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