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How ready is Europe for the "Smart Building Revolution"?

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Europe needs to accelerate the smart and sustainable energy transition





Buildings recognise, predict, and respond to needs, lifestyles, and habits of occupants

CHILDREN ARE NOT TO BE LEFT UNATTENDED WHEN ON THE BALCONY

PLEASE KEEP BALCONY DOOR CLOSED WHEN THE A/C IS ON

PLEASE DO NOT HANG TOWELS OVER THE BALCONY

Actual vs designed energy consumption BPIE

Monitoring designed and actual heat use of low-energy dwellings and the effect of user behaviour on the final energy demand



Source: Ghent University

Buildings are becoming micro-energy hubs

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Intelligent & User-friendly

Energy Efficiency

Renewable Energy Production



10 principles for smart buildings in a decarbonised energy system

- All principles important separately, but most effectively considered together
- Apart from principle 1, the sequence is not in order of importance







Defining a smart building



A smart building is highly energy efficient and covers its very low energy demand to a large extent by on-site or district-system-driven renewable energy sources.

A smart building:

- stabilises and drives a faster decarbonisation of the energy systems through energy storage and demandside flexibility;
- empowers its users and occupants with control over the energy flows;
- recognises and reacts to users' and occupants' needs in terms of comfort, health, indoor air quality, safety as well as operational requirements.



Mapping a smart-ready built environment





Indicator scoring for the Smart-Ready Built Environment

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Efficient and healthy buildings





Renewable energy uptake

- Share of renewable energy in gross final energy consumption
- More RES = incentives for storage, demand flexibility and a dynamic energy market
- No evaluation on the national renewable energy targets



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Demand response availability

Demand response market

- Indication of the authorisation of DR and aggregation of demand
- FI, FR and UK are the leading countries
- Reducing peak consumption to avoid grid imbalance
- Enabling security of supply, renewable energy and increased market competition

Commercially open Open to most actors Open to large industrial actors Very limited participation Closed

Smart meter deployment

- SE, FI and IT have completed their roll-out of smart meters
- Smart meters empower endusers with a better understanding and control over their energy consumption
- A two-way communication between the consumer and the utility company should be enabled
- Accurate measurement is a requirement to valorise demand response services



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Is Europe ready for smart buildings?

- No country is fully ready
- SE, FI, DK and NL are the leading countries
- Overall low score
 - Rigid regulatory frameworks, e.g. demand response
 - Lack of investments, e.g. building energy performance or smart meters
 - Recent market penetration of some technologies, e.g. building energy storage and electric vehicles



The Edge, Amsterdam **Smartness Indicator** ☑☆☆☆☆☆ ** ** Energy Efficiency ☆☆ ☆







Thank you...

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