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Policy roadblocks: how regulation is holding back Europe's transition to net-zero buildings

A new paradigm for buildings

Widespread decarbonization of buildings means changing their role in Europe's energy system. No longer can European homes, businesses and public facilities only consume energy — they must produce it as well. Whether this energy comes directly from rooftop solar panels or by optimizing a building's heating demand, energy will be just as likely to flow out of the building as into it.

The ability of buildings to properly function in a sustainable and integrated energy system hinges on their "smartness". In other words, their options for tracking their energy demand and supply in real time are important, as this data allows the buildings to actively participate in the energy system. A 2023 <u>report</u> by ACER showed that flexibility in the European power system will need to double by 2030 and called on Member States to assess their flexibility needs and use their National Energy and Climate Plans (NECPs) to create common flexibility initiatives, such as smart buildings. In WeForming, a project funded by the EU's Horizon Europe Programme (Grant Agreement No. 101123556), we are focused on creating regulatory, technical, societal, and business pathways to support the widespread adoption of Intelligent Grid-Forming Buildings (iGFBs).





Understanding the challenges

As always, regulation is key. Smart buildings are currently facing a complex array of regulatory barriers, preventing them from achieving this uptake in Europe. These barriers exist both at the EU level in the numerous directives which influence the regulation of the energy sector, and at the national level where Member States are responsible for implementing such directives and developing their own policies and frameworks. We have evaluated the prevalence of these barriers and created a policy checklist to address them, briefly discussed here.

First, a handful of overarching issues set the scene for the regulatory barriers that we will discuss. These issues are relevant to smart buildings and to electrification in general. For one, electricity is too expensive in relation to fossil fuels. In many Member States, it is still cheaper per unit energy to heat using fossil gas or even fuel oil. Besides being problematic for the climate, this exposes energy consumers to financial risk due to volatile fossil fuel prices, as seen already in 2022. Moreover, the uptake of electrification technologies, such as heat pumps, is not progressing as quickly as needed. There is a lack of clear direction of travel on phasing out fossil fuel boilers and on market needs clarity for electrification technologies.







Within the buildings themselves, low energy performance can further limit their integration potential. If the building is leaky, it will lose heat rapidly thus limiting its window for residents to adjust their heating demand in response to price signals, for example. In other words, they require more flexibility to be flexible. These low-performing buildings need to be renovated. Finally, they are lacking the necessary devices to enable their integration with the energy system, notably smart meters.

Barriers and opportunities with existing legislation

The European Union has passed several pieces of legislation which frame the opportunities and barriers for the deployment of smart buildings. The Energy Performance of Buildings Directive (EPBD) deploys efficient infrastructure and sets requirements for building energy data disclosure, but it lacks minimum energy efficiency standards that would improve flexibility potential. The Electricity Market Design requires national flexibility assessments but does not establish roles for active consumers and aggregators, an ask which would clarify their positions and interactions in a next-generation energy system.

The Renewable Energy Directive (RED) mandates a 49% share of renewables in buildings by 2030, but lacks demand-side flexibility targets, an important suggestion made by the European Parliament during the RED's revision process which was not adopted. Although the Energy Efficiency Directive requires an energy savings obligation that encourages deploying smart buildings and electrification technologies, the Energy Taxation Directive still allows Member States to tax electricity at higher rates than fossil fuels, contributing greatly to the price imbalance.

At national level, progress varies. Key issues include a need to accelerate smart meter roll-out, a lack of proper legal frameworks for demand response, and low or non-existent incentives for flexibility. While some countries are leading on certain issues, such as a strong smart meter roll-out in Ireland and Spain, they are struggling on others, such as Ireland's lack of demand response framework and Spain's challenges on integrated distributed generation. Finally, most countries are falling behind implementing frameworks for demand response aggregation and flexibility and few have rolled out time-differentiated electricity tariffs.



Introducing WeForming's regulatory barrier checklist for policy makers

As a result, progress towards reducing the regulatory barriers has been inconsistent. WeForming partners have created a checklist for policy makers to assess the state of their regulatory and technical barriers to smart buildings and help overcome them. It recommends providing regulatory clarity concerning smart buildings and incentives for smart buildings to participate in energy markets, mandating the adoption of technical standards for smart buildings such as communication protocols and electrical standards as well as promoting the deployment of smart meters, providing financial incentives and supporting innovative business models.

Interested parties can read more about these issues and the full WeForming's recommendations in the project's deliverable 2.1 "State-of-the-Art analysis, barriers, regulatory framework and end-users' requirements", which will be published <u>here</u> over the course of the project.



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Duncan Gibb advises on the technologies, policies and data needed to switch to clean heating. He leads RAP's European work on the economics of heat pumps and has published multiple papers, notably on economics and policy, the Renewable Energy Directive and cold-climate heat pumps. Duncan joined RAP's Europe team in 2022 with more than 10 years' experience in energy research and policy analysis. He is an engineer by training, holding a Master of Science from the University of Freiburg and a Bachelor of Chemical Engineering from Dalhousie University in Halifax, Canada.

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