Is the European residential building sector deviating from its targets? Insights from Monitoring and Modelling Approaches

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Introduction / background

The decarbonisation targets for the building sector are defined at the European level by the EPBD directive, which sets objectives in terms of energy efficiency gains and reductions in greenhouse gas emissions - for example, through Article 9(1) minimum energy performance standards (MEPS) for non-residential buildings, Article 9(2) reduction targets for residential buildings, the overall objective of achieving a zero-emission building (ZEB) stock by 2050, and the National Building Renovation Plans (NBRPs) as the frameworks for defining national objectives and roadmaps.

These targets are then transposed and adapted at the national level by Member States, but their expression varies considerably. They often take the form of input-based objectives, such as renovation rates or numbers of renovated dwellings (with or without specifications regarding renovation depth), equipment replacement targets, or improvements in the distribution of EPC labels. As an illustration, Italy has set explicit renovation rate targets to be achieved by specific deadlines. France and Belgium have done the same, while also establishing complementary objectives such as the progressive phase-out of fossil fuel heating systems and regulatory restrictions on the rental of the most energy-inefficient dwellings.

To effectively assess whether these objectives are being met, understand their impact and internal consistency, and draw meaningful insights, it is essential to rely on robust and consistent national statistics that are aligned with the way these objectives are defined. This requires, for example, the establishment of national observatories to track key indicators such as renovation rates, the stock of heating systems, or the distribution of dwellings by EPC class.

In practice, however, the available data is often insufficient: there is a lack of systematic monitoring, incomplete indicators, and heterogeneous methodologies. These limitations can hinder strategic planning and adjustment, both for public policies and for private-sector initiatives, in the medium and long term.

Methodology

This study proposes an analysis of the building sector based on two complementary approaches. The first is a monitoring and trend-analysis approach, which consists of analysing historical developments and comparing them with the announced objectives. The second relies on prospective modelling, aiming to assess the coherence and feasibility of the strategic decarbonisation targets.

This initial analysis covers five countries: France, Belgium, Germany, Italy, and Spain. It is structured around three main areas:

1. Mapping available national statistics and assessing their alignment with the formulation of building sector decarbonisation objectives.
2. Assessing the feasibility of achieving renovation and heating system replacement targets, considering recent trends in the renovation market and available financing mechanisms.
3. Proposing, where relevant, alternative scenarios to those outlined in national building renovation plans.

Results

This study presents, for each analysed country, a set of indicators and targets aligned with available data, to facilitate robust monitoring of decarbonization progress in the building sector. It highlights a widespread risk of delays in achieving medium-term targets, primarily due to slow implementation of public policies and financing mechanisms (see, for instance, the case of France in Figure 1). The study also presents several innovative examples of funding instruments and public policies, which could provide avenues to strengthen a shared European narrative focused on achievable and timely objectives.

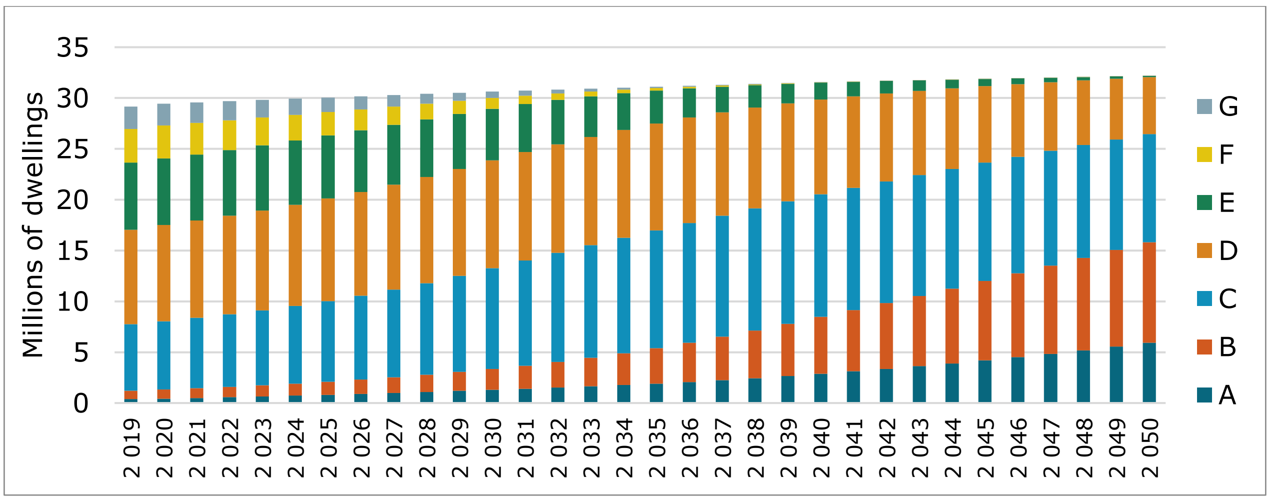

Figure 1: Evolution of the distribution of EPCs in France for residential buildings in a scenario of delayed achievement of the national low-carbon strategy objectives.

Conclusion & discussions

Our findings highlight the critical role of medium- and long-term transition indicators in supporting the transformation of the residential sector. This work represents a first step toward building a broader mapping at the level of the entire European Union, with the aim of identifying existing data sources, qualifying national decarbonisation targets, and assessing the plausibility of achieving them