

**INCREASING ENERGY EFFICIENCY IN BUILDINGS
IN ROMANIA:
CHALLENGES, OPPORTUNITIES AND POLICY
RECOMMENDATIONS**

Executive Summary

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Globally, no less than 2 billion people live in precarious housing, often lacking access to energy and utilities. In the relatively prosperous Europe, about 50 million citizens live in under-heated and poorly illuminated homes. Nearly a third of the total housing stock in Romania, especially the buildings built before 1985, require major repairs and technical upgrades. Almost half of Romanians are heating their homes with firewood at low efficiency.

Energy poverty is a widespread phenomenon in Romania, and also across Europe. In the toolkit available to combat energy poverty, increasing energy efficiency in buildings through renovation is one of the most cost-effective methods. Yet the urgency of renovating the buildings stock has to do not only with improving living standards, but also with the need to reduce greenhouse gas (GHG) emissions. The buildings sector is a large energy consumer (40% of final consumption in the EU), and the energy sector is a large GHG emitter (36% of the total amount in the EU). The IEA shows that increasing energy efficiency in buildings is essential to reach the Paris Agreement's target of limiting average temperature rise to 2°C over pre-industrial times by the end of this century.

The EU energy efficiency target for 2020, adopted in 2007, is 20% (i.e. a 20% reduction in EU primary energy consumption) compared to 2005. For Romania, this indicative target is expressed as primary energy savings of 43 mt, respectively 30.3 mt of final energy consumption. The Commission's 2017 evaluation report shows that, although Romania is among the 15 member states that have achieved energy savings beyond the annual level needed to reach the target, the situation has deteriorated in the residential and transport sectors, which reflects the narrowing of energy consumption gap per capita compared to Western European countries.

For 2030, the EU target regarding energy efficiency, set in 2014 for all member states, was 27%. The figure was raised to 32.5% in 2018, by consensus between the Commission, the European Parliament and the EU Council, with a clause of additional revision to upgrade the rate until 2023. To sustain such growth, significant investment is required, supported by public policies and incentivized by favorable regulations.

Energy efficiency also has other positive effects: economic, by increasing employment; macroeconomic, by reducing trade imbalances as a result of decreased energy imports; public health, by reducing mortality and morbidity as a result of diminishing emissions – GHG and particulate matter; and social, by reducing energy poverty.

Energy efficiency in buildings is a priority of the European energy and climate change policies, along with policies regarding security of energy supply and the fight against energy poverty. The European regulation framework for energy efficiency in buildings is mainly defined by two major directives: the Energy Performance of Buildings Directive (EPBD) and the Energy Efficiency Directive (EED).

The EPBD, adopted in 2002, introduced energy efficiency requirements in national building codes. The 2010 revision brought the vision of buildings evolving towards *near-zero energy buildings* (nZEB). The directive also sets an EU-wide framework for a common methodology to calculate the energy efficiency of buildings and introduces minimum energy performance standards in buildings.

Thus, it made the requirement that, until 31 December 2020, all new buildings must be nZEB, and that from 31 December 2018 all new buildings owned and occupied by public authorities must be nZEB. It made mandatory that an energy performance certificate be issued every time a unit is sold or rented, and that energy audits for large companies be made at least once every four years. The most recent revision of the EPBD came with the 2016 Clean Energy for all Europeans Package, which brought new requirements in support of e-mobility infrastructure and implementation of smart technologies in buildings, while emphasizing the health and quality of life dimensions for the building users.

The most important energy efficiency funds of about €18 bn for the 2014-2020 period are allocated through the European Structural Fund (ESIF) – about three times more than in the 2007-2013 period – and the European Investment Fund (EFSI). In February 2018, the European Investment Bank (EIB) launched the *Smart Intelligence for Intelligent Buildings* initiative, to make it easier to invest in projects that increase the energy performance of buildings by using EU grants as a financial guarantee. The initiative aims to unlock a total of €10 bn by 2020 for investments in energy efficiency in buildings and renewable energy sources (RES).

The Energy Efficiency Directive (EED), adopted in 2012, required member states to adopt indicative energy efficiency targets for 2020. To achieve the ambitious target of 32.5% for 2030, new measures have been introduced through a reviewed EED. Among them, the obligation for distribution companies and energy suppliers to achieve savings of at least 1.5% of the current sales volume to end-users, or that the public sector only acquires buildings with high energy performance and energy-efficient products and services. Annually, the member states must increase the energy performance of administrative buildings by renovating at least 3% of the total buildings' area owned and occupied by public authorities.

There are about 8.2 million homes in Romania, distributed in 5.1 million buildings. In the urban area, 72% of the dwellings are in city blocks, while in the rural area 94.5% of the dwellings are single-family houses. The latter represents no less than 98% of the residential stock, while 37% of the homes in Romania are concentrated in just 2% of the residential buildings. The total living area has increased in Romania from 270 million m² in 2000 to 425 million m² in 2016. Most of the residential buildings were built between 1961 and 1980, in the absence of efficiency standards for the building envelope. About 53% of the residential buildings were built before 1970 and over 90% before 1989, with an energy performance level between 150 and 400 kWh/m²/year. In Romania, one in seven families face serious housing problems, most often regarding poor quality of walls, floors, and window frames.

Public administration, educational and commercial buildings account for about 75% of non-residential energy consumption, each with 20-25% of the total. Schools are the largest energy consumers (354 kWh/m²/year), with other sectors ranging from 200 to 250 kWh/m²/year. At the other extreme, new office buildings in urban centers have, to a large extent, green building certification, which certifies ecological performance throughout the building's life cycle.

In 2017, the Ministry of Regional Development, Public Administration and European Funds (MDRAP) published the *Strategy for mobilizing investment in the renovation of residential and*

commercial buildings, both public and private. The strategy presents an analysis of four scenarios for buildings renovation – structural (annual renovation of 1% of the built area), modest (slow renovation rate and small surface renovation), intermediate (average renovation rate and intermediate renovation route) and ambitious (average renovation rate and extended renovation route). The results show that the major energy savings are achieved in the ambitious renovation scenario – 61% less energy demand in 2050 than 2010 – and a corresponding reduction in GHG emissions – 89% less in 2050 than the emission level of 2010.

Moreover, the strategy identifies several types of obstacles that make it difficult to carry out building renovation programs: legislative (the existence of multiple authorities with responsibilities in the field and without a clear regulation framework), economic (insufficient funds for building renovation, high operating costs from the energy service companies (ESCO), the execution of low-quality renovation works etc.) as well as a lack of skills and training (shortage of skilled workers using energy efficiency technologies and systems, as well as RES integration).

The study sets out policy recommendations and priority actions aimed at facilitating the deep renovation of the real estate fund in Romania, including: establishment of programs financed from public funds for the renovation of buildings inhabited by people in energy poverty; achieving an annual renovation rate of 3% for public buildings; support for the installation of RES systems in buildings; introduction of an energy efficiency obligation scheme based on minimum standards; maximizing the absorption of European funds; developing the regulatory framework for ESCOs and the energy performance contracts; support for “green loans”; establishing a support scheme for the renovation of single-family houses, including a bonus for the use of heat-insulating materials and other performance-enhancing solutions; additionally to the cost standards, the introduction of quality standards into the criteria for funding under the Regional Operational Program.