**Renátó Ritter*:**

Making homes more energy efficient is key to Hungary's energy independence

Appetite for building new homes in Hungary has been too slow to help the country in its efforts to wean itself off energy imports. Since 1991, the annual renewal rate of the total housing stock has exceeded 1 per cent only once which leaves Hungary's housing stock more obsolete than the EU average. Substandard properties are associated with higher energy consumption. It means Hungary will not move towards energy independence before households speed up constructions of their home. However, recent improvement seen in the top 15 per cent of energy-certified housing stock is a cause for hope.

Improving the quality of Hungary's housing stock can make a major contribution to improving Hungary's energy independence. The share of households in the final energy consumption has always been high, ranging from 34–40 per cent in the last 30 years since the change of regime, while in the European Union it has been much lower (26–29 per cent). According to 2019 data, 71 per cent of the final energy consumption in households was related to heating, but the amount of energy required for this depends largely on the energy characteristics of the property.

**Evolution of the domestic final energy consumption by sector**
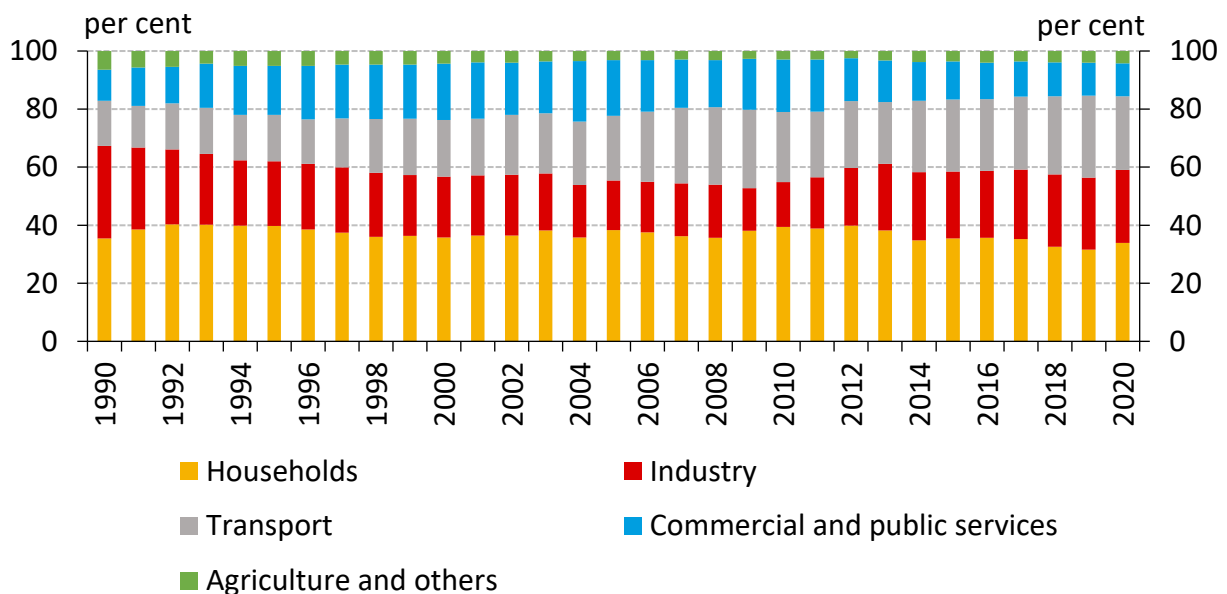
Source: Eurostat

According to the Ministerial Decree 7/2006 (V. 24.) TNM (minister without portfolio), from 1 July 2022, the minimum energy rating BB will be a prerequisite for the occupancy of residential buildings, which is expected to contribute greatly to reducing the energy consumption. However, the rate of renewal of the housing stock does not paint a promising picture of a significant improvement in its energy quality. The renewal rate shows how many years the total housing stock would need to be fully replaced, depending on current building construction figures. On this basis,

a value of 1 per cent would mean, for example, that 100 years would be needed to renew the total housing stock.

In the last 30 years, the annual renewal rate has exceeded 1 per cent only once, and in the last 10 years it has reached even half a per cent only once, which indicates a significant obsolescence. As the number of handovers of new buildings is influenced by many macroeconomic factors and regulatory actions are relatively slow to take effect, it is also worth looking at the renewal rate using a 10-year moving average. Its value has been falling steadily since 1995, except for the last two years. In 2021, the renewal rate was 0.33 per cent, only slightly higher than the low of 0.30 per cent in 2019. This means that the total housing stock would take 303 years to fully renew based on the 2021 values.

The evolution of the renewal rate of the housing stock*
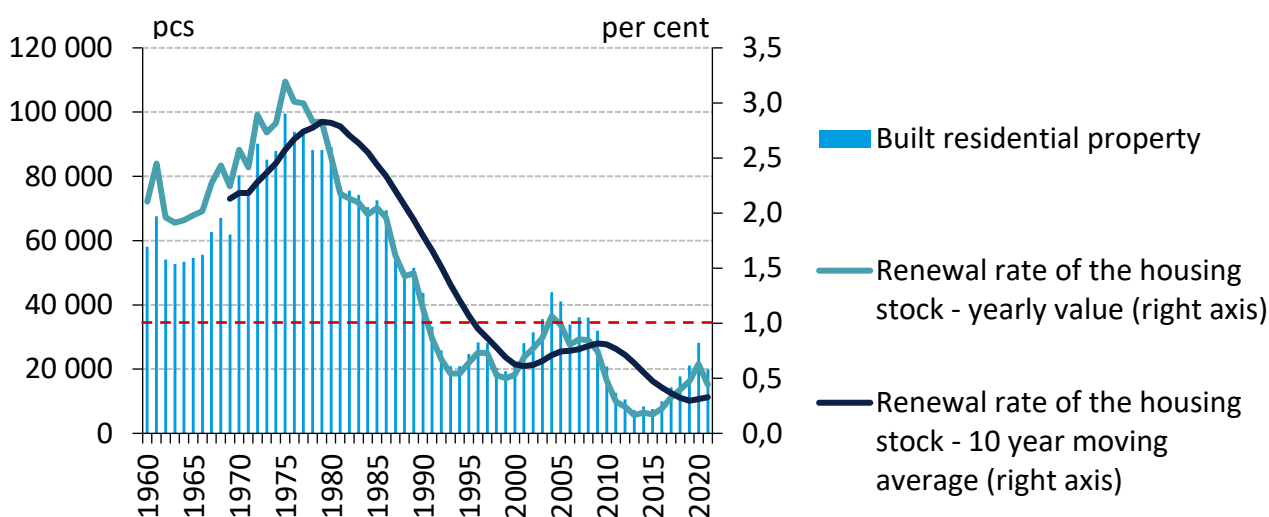

Sources: HCSO, MNB
* Data on the total housing stock between 1960 and 2000 are only available in 10-year increments, so the annual construction data for the years before 2000 have been divided by the housing stock data for the corresponding decade in the calculation of the renewal rate. The red line indicates the limit of the 100-year renewal rate, above which the building stock would be renewed within 100 years and below which it would be renewed beyond 100 years.

It is worth noting that increasing the number of new homes is only one possible way to achieve energy efficiency targets. The deep renovation of outdated residential properties could be another key to increasing the share of energy-efficient properties, bearing in mind that a deep renovation is typically more cost-effective and uses fewer natural resources than building a new dwelling. According to a 2021 study by the Hungarian Energy Efficiency Institute, 3.7 million homes in Hungary need to be renovated to meet the 2050 climate neutrality targets, which means 100–130 thousand homes per year.

The weak outlook for improvements in the building stock also underlines the need for the MNB's energy efficiency programmes. Under the green mortgage bond purchase programme, the MNB has purchased nearly HUF 61 billion of green mortgage bonds to finance green real estates. Under the Green Home Programme, HUF 200 billion of preferential loans have been made available by credit institutions, the amount of which was further increased by HUF 100 billion in April 2022 by the central bank. The MNB has granted preferential capital requirements to credit institutions for HUF 10.5 billion of green housing loans under the green preferential capital requirement programme. The latter will be extended later this year to include energy renovations.

Information on the quality of the housing stock can be obtained from the distribution of energy performance certificates that must be issued when a property is occupied, sold or rented, where the minimal energy need (AA++) rating is the best and the extremely bad (JJ) rating the worst. Based on the more than 900,000 energy performance certificates issued since 2016, there is a significant gap in the energy quality of the total housing stock: almost 65 per cent of the total stock had an energy rating below close to modern (DD) at the end of 2021.

Distribution of energy certificates issued by classification
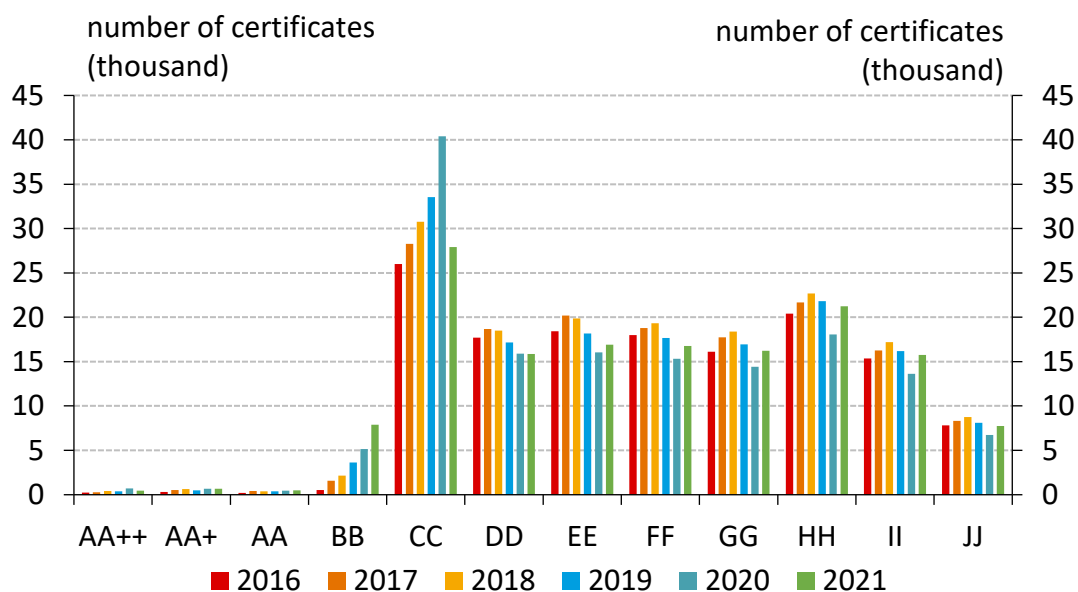
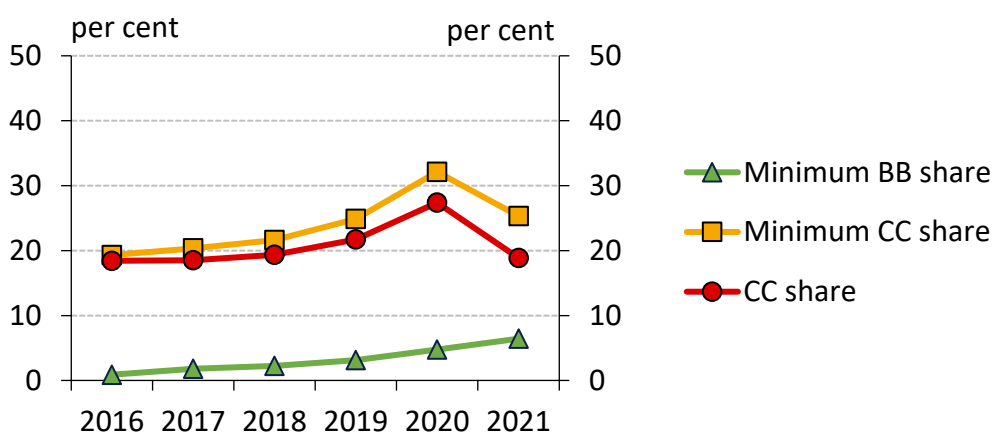*Sources: Lechner Knowledge Center, MNB*

The European Union's Taxonomy Regulation, which regulates sustainable investments, and its supplementing Regulation, which defines the mitigation and adaptation activities in respect of the climate change, determines that the financing of which residential property is considered sustainable financing, aligning with the EU Taxonomy.

Under the Regulation, the primary energy demand for new buildings must be at least 10 per cent lower than the threshold for nearly zero-energy (BB) buildings (90 kWh/m^2a). This criterion also applies to residential properties eligible for the Green Home Programme. The Regulation provides differently for the purchase of immovable properties and their financing. For buildings constructed after 31 December 2020, a property that meets the requirements for new construction (90

kWh/m^{2}a) is considered a Taxonomy-aligned financing, while for buildings constructed before 31 December 2020, it is sufficient to meet the primary energy requirement of the top 15 per cent of the existing building stock.

Based on the available certificates, 24 per cent of the total housing stock achieves at least the CC rating, which is the first class that is considered state-of-the-art. Looking at the annual composition data, the steady increase in the share of properties with a minimum CC rating in a given year stalled in 2021, mainly due to a decrease in the share of properties with a CC rating in 2021. The falling back to the 2016–2017 levels could be explained by the decline from the high number of new dwellings built in 2020 to the average level of previous years. On the positive side, the share of properties with a BB or superior rating is steadily increasing: their value is 3.2 per cent of the total stock, while these high-level energy certificates accounted for 6.4 per cent of the certificates issued in 2021.

Annual evolution of the share of housing with minimum modern rating

Source: Lechner Knowledge Center, MNB

The top 15 per cent of the building stock showed a steady improvement over the 2016–2019 sample, with the threshold for entering the top 15 per cent being [118 kWh/m^{2}a](#) primary energy demand over the four years, and buildings with lower energy demand could reasonably be considered to be in the top 15 per cent. The database of the Lechner Knowledge Center on which the calculation is based is transaction-based, but no energy efficiency data is available for the total housing stock. Adding two more years to the previous results of the analysis, the overall stock continues to show a positive trend for the top 15 per cent in terms of energy demand.

Distribution of primary energy demand of residential buildings rated CC and above within all energy certificates issued*
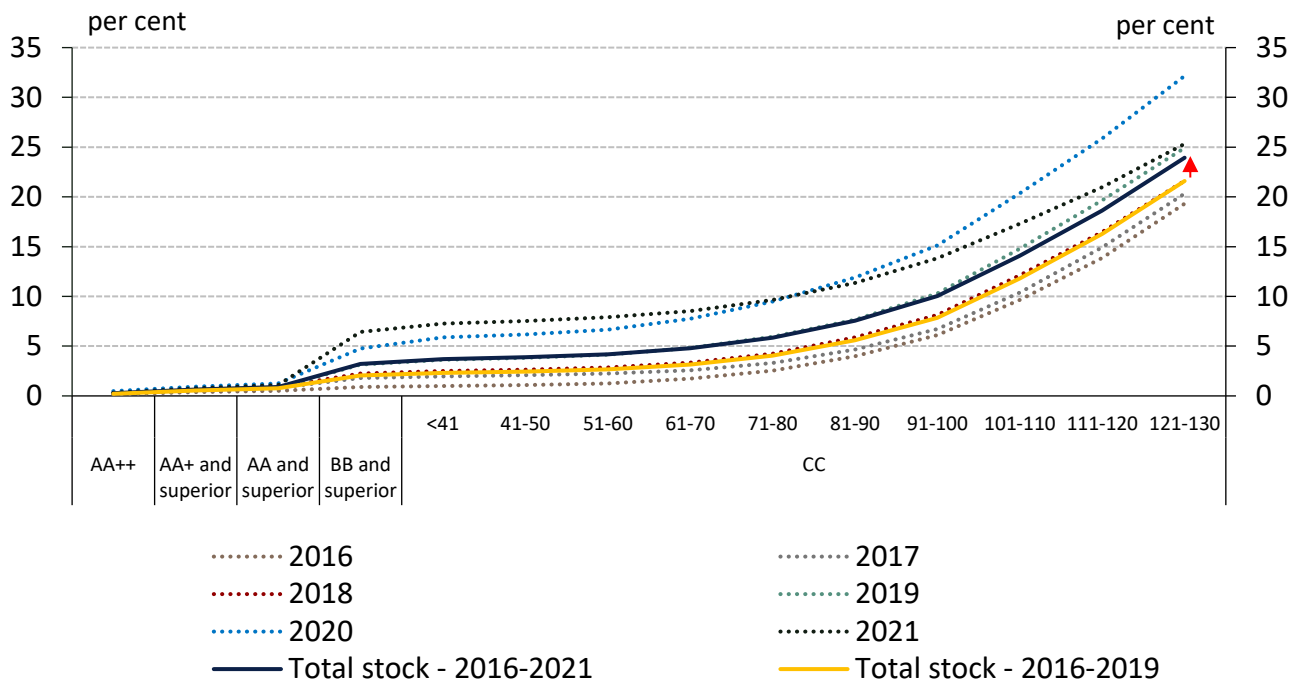
Source: Lechner Knowledge centre, MNB

* The energy demand threshold for the CC category is officially between 100–130 kWh/m²a, but other criteria must also be met to achieve better ratings, for example, to be of BB rating, at least 25 per cent of the building's energy needs must be met by renewable energy (expected to change).

Each line in the figure above measures the cumulative evolution of the amount of primary energy demand in kWh/m²a according to the energy certificates issued in a given year, as a percentage of the total housing stock. Based on the results, the primary energy demand of buildings in the top 15 per cent showed a steady improvement between 2016 and 2020, but the 2021 values show a decline compared to the values in 2020 which was an outstanding year. Compared to the previous 2016–2019 values, however, the 2016–2021 time series indicates a significantly better quality top 15 per cent, resulting in a decrease in primary energy demand.

Annual energy demand threshold for the top 15 per cent of residential buildings and the number of certificates issued

| Year	Threshold value (kWh/m²a) based on the primary energy demand of the top 15 per cent	Number of total certificates issued
2016	123	141,083
2017	121	152,688
2018	117	159,125
2019	111	154,453
2020	100	147,498
2021	104	147,956
2016–2021	**113**	**902,803**

Source: Lechner Knowledge Center, MNB

The steady narrowing of the CC class in the top 15 per cent results in a decreasing primary energy demand of the annual housing stock. The exception is the 2021 data point mentioned earlier, but this also shows considerable improvement compared to 2019. While in 2016, more than 76 per cent of the CC class was compliant for the top 15 per cent, in 2021 only 45 per cent complied.

The average annual improvement in energy demand between 2016 and 2021 was 4.6 kWh/m²a, indicating an acceleration in the rate of improvement compared to the 4 kWh/m²a calculated between 2016 and 2019. The entry threshold for the top 15 per cent is 113 kWh/m²a based on the 2016–2021 housing stock, an improvement of 5 kWh/m²a compared to the previous value of 118 kWh/m²a. During the 2016–2021 period, 20 per cent of the total housing stock had been certified, mainly marketable properties. The sample is therefore skewed, as it is likely that the lowest quality properties do not have energy certification, which may result in the top 15 per cent of the housing stock having higher energy demand than shown.

The Climate Bond Initiative (CBI), one of the most important green certification bodies, has a rating system that, like the Taxonomy Regulation, considers the top 15 per cent of the building stock to be green. The relevant threshold was also set by the CBI in January 2021 for Hungary with the contribution of the MNB. The criteria for the top 15 per cent of the Hungarian building stock to achieve climate neutrality by 2050 determined an energy efficiency improvement trajectory pathway. Based on this trajectory, an average annual improvement rate of 4 kWh/m²a is expected. The housing stock threshold exceeded the target, with a primary energy demand threshold of 113 kWh/m²a instead of 114 kWh/m²a for 2021.

CBI certification compliant residential buildings' projected energy efficiency improvement trajectory until 2050
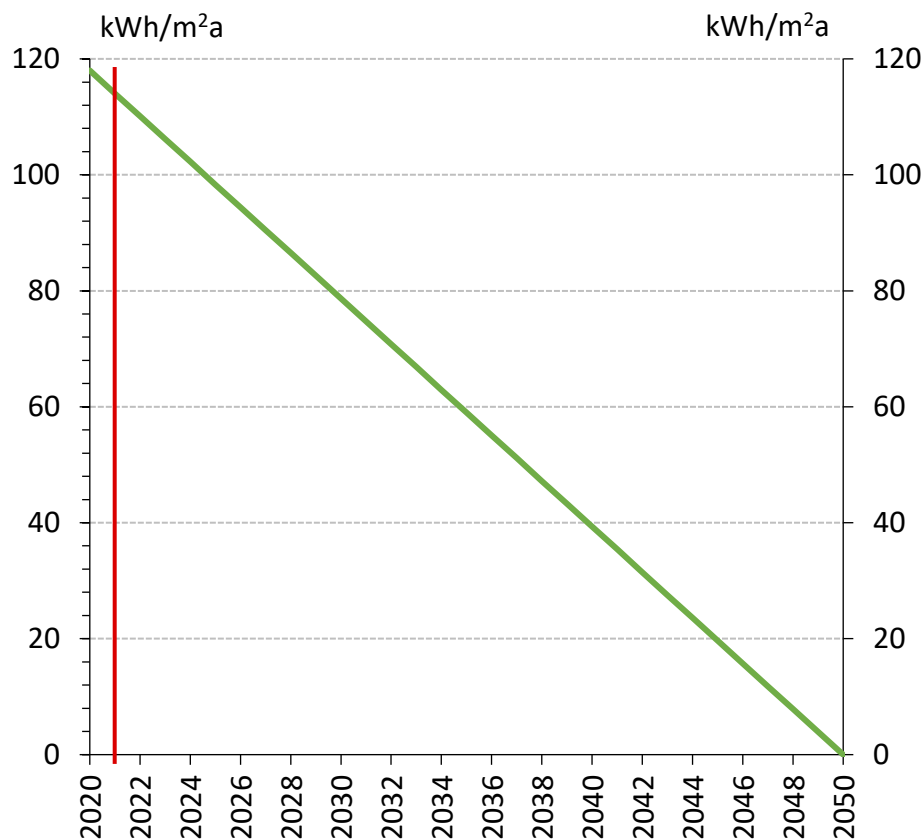

Source: Climate Bond Initiative, MNB

Note: The annual actual threshold expected by the CBI is the intersection of the green and red lines and was 114 kWh/m²a for 2021.

The lowest rating sufficient to reach the top 15 per cent may differ in some regions, which may justify spatial differentiation when developing new regulations and subsidies. A good illustration of the situation is the variation between regions in the classification of the lowest energy quality properties to be included to reach the top 15 per cent. It is mainly in the Northern Hungary and Northern Great Plain regions that the gap in terms of the energy efficiency of the housing stock is most severe, with even 32 per cent of the DD class in the former being sufficient to reach the top 15 per cent. In contrast, the best performing county is Pest County, where only 34 per cent of the CC class is in the top 15 per cent, followed by Budapest with 46 per cent.

Energy certification classification sufficient to reach the regional top 15 per cent*
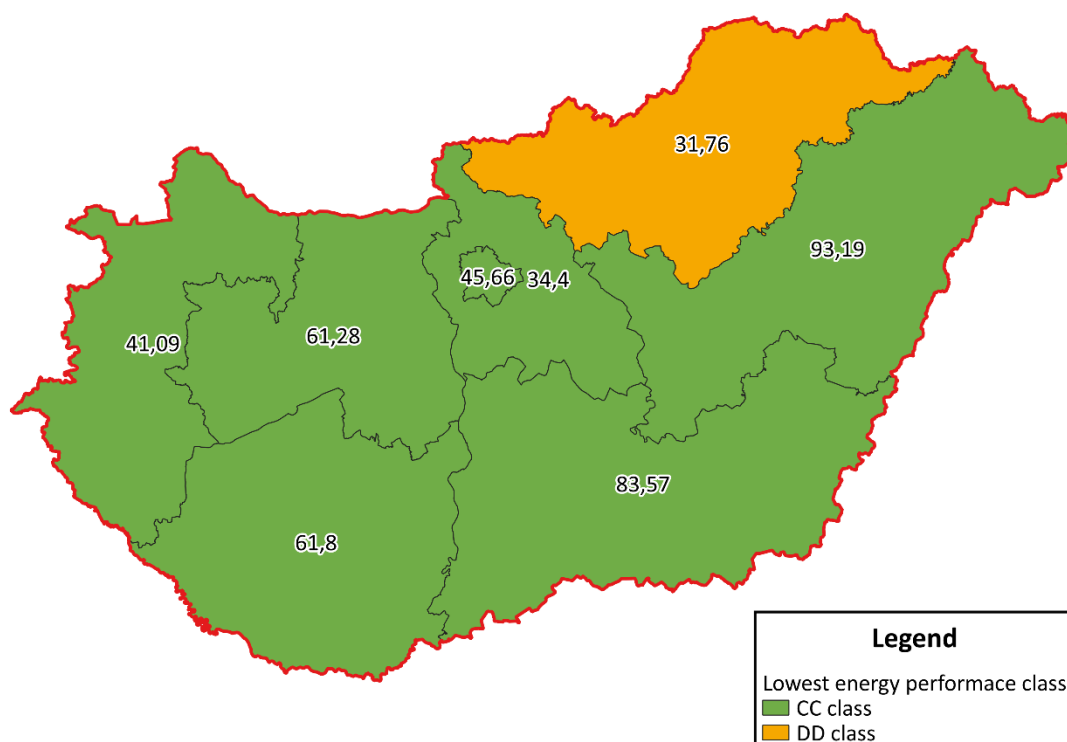
Source: Lechner Knowledge Center, MNB
The figures indicate the percentage of the lowest rating in a given region that is sufficient to reach the top 15 per cent.

In the disclosures under Article 8 of the Taxonomy Regulation, credit institutions will soon be required to report on the proportion of green and non-green residential properties financed which will require a database of energy performance certificates for residential properties financed by these institutions. In addition to the disclosure requirements, institutions can also examine the carbon intensity of their real estate portfolio. A good tool for this could be the emissions database developed by the Partnership for Carbon Accounting Financials for European (including Hungarian) residential buildings, where the "emission factor" value of each building type/energy rating pair is available.

It will also be worth monitoring the expected amendment of the Ministerial Decree 7/2006 (V. 24.) TNM (minister without portfolio) regulating the domestic energy certification system, where, among other things, the criteria for achieving BB and superior ratings will be modified. This can have a major impact on the classification of CC class certificates, as almost 33 per cent of the total CC class exceeds the BB class's 100 kWh/m²a primary energy demand threshold. It is likely that these CC class buildings with lower energy demand will predominantly qualify in the future as BB or superior. We still have a long way to go to reach our climate neutrality targets. To achieve and finance them, we need to rethink the financial and regulatory tools we have used so far and get as many actors as possible interested in acting in time.

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