IN-DEPTH ANALYSIS

Requested by the HOUS Special Committee

European Parliament

Construction and Renovation in the EU Housing Markets: Challenges and Opportunities to Ensure Affordability

Policy Department for Transport, Employment and Social Affairs
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Abstract

The construction sector plays a key role in fostering economic growth and in ensuring housing affordability. However, the sector faces many challenges. Designing a framework that allows for productivity growth is essential, especially since the labour force is shrinking. Moreover, solutions have to be found for the land shortage issue and the disincentives to renovations for older or low-income households, which are unable to bear investment costs.

This in-depth analysis discusses the key challenges of constructing new residential dwellings and renovating existing ones, discusses implications for housing affordability, and presents policy recommendations to address these issues. Housing rehabilitation is also briefly discussed.

This document was requested by the European Parliament's Special Committee on the Housing Crisis in the European Union.

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EXECUTIVE SUMMARY

The EU housing markets face multiple challenges, including an i) **insufficient construction of new residential dwellings** and ii) **slow progress in renovating the existing, energy-inefficient building stock**. More specifically, rising construction and financing costs, scarce land, labour shortages, and low productivity are constraining the supply of residential dwellings, which in turn undermines housing affordability as rental prices and house purchase prices increase. At the same time, the EU Renovation Wave Strategy is essential to cut emissions and reduce energy poverty, but high investment costs, financing barriers, and socio-demographic factors slow down its uptake.

Improving housing affordability demands a twin strategy: scaling up cost-efficient new construction and accelerating socially fair renovations. Coordinated EU and national action — grounded in best practices and social safeguards — is essential to meet housing needs, advance climate goals, and ensure the green transition benefits all households. To achieve this twin strategy, the key challenges in construction and renovation should be addressed:

i) Construction – Key challenges & policy recommendations

- **Low productivity** limits output and drives up construction costs. Countries such as the Netherlands and Denmark show that digitalised permitting, integrated planning, and replication of already existing designs can cut costs and boost efficiency.
- **Labour shortages** require sector-wide training schemes and more attractive working conditions (like prefabrication, i.e. building components, such as walls or floors, are made in a factory before being assembled on site) to attract new groups of workers.
- **Land scarcity** in urban areas calls for better allocation schemes that ensure the provision of affordable homes. This can be achieved through, for example, concept-based allocation, where land is allocated based on specific development requirements, such as prioritising small or simple apartments and mandating a quota of social housing units, rather than being sold to the highest bidder. Moreover, the conversion of commercial buildings into housing could be facilitated.
- **Expanding the supply of building land** is essential for creating affordable housing. Policymakers could also make greater use of urban densification measures, including adding additional floors to multi-family buildings and converting attics, to increase housing capacity efficiently.
- **Fragmented regulations** hinder an increasing output in construction; harmonising rules nationally and eventually across the EU could foster more innovation and would help the construction sector reduce costs, for example with the use of prefabrication.

ii) Renovation – Key challenges & policy recommendations

- **High investment costs and stricter banking rules** reduce access to credit; targeted subsidies and use of carbon pricing revenues can shield low-income households from rent or cost increases.
- **Balancing the costs and benefits of renovations**: Renovations aimed at achieving top-tier energy efficiency classes, such as A and B, are often associated with very high costs. In contrast, renovating buildings with very poor energy efficiency usually entails higher upfront costs, but the significantly larger energy savings generally result in a more favourable cost–benefit ratio than in the case of buildings with medium energy efficiency. Therefore, worst-performing buildings could be prioritised, as they achieve the highest energy and affordability gains.
- **Skilled labour shortages**, especially of heating engineers, can be addressed through targeted training and by bundling retrofitting activities. Additionally, rolling out more digital tools, such as Building Information Modelling, could both boost productivity and attract more skilled workers, especially younger professionals, to the construction and renovation sectors.
- **Lack of transparency on energy performance** could be addressed through harmonised EU-rules on energy performance certificates.
- **Policymakers could use property transfers** as trigger points for energy-efficient renovations by linking them with targeted subsidies or regulatory incentives. Regarding the inheritance of property, in the Scandinavian countries, positive results have been achieved by obliging heirs to obtain an energy assessment, which also included a potential renovation roadmap.

1. INTRODUCTION

The affordability of housing is a pressing topic in most European countries, particularly in urban areas. A key contributing factor to this issue is the **structural shift in employment**, with a decline in the industrial sector and a growth in the service sector, especially for highly skilled workers (as noted by Moretti, 2013). This shift increases pressure on urban housing markets because the service sector is primarily located in urban areas. Furthermore, **demographic trends, such as migration to cities and changes in household composition**, also play a significant role. The **limited supply of housing and the recent surge in construction costs across Europe** have also led to higher housing prices, further eroding affordability for many households. Also, **interest rates are another burden**. Depending on the country, interest rates for real estate financing have risen by two to three percentage points since the beginning of 2022 (see Voigtländer, 2025). Higher interest rates combined with higher construction costs make investments in the housing market less attractive and housing even more costly.

Housing affordability is determined not only by direct housing costs, such as rents or mortgage payments, but also significantly by heating costs. The surge in energy costs, exacerbated by the Russian war against Ukraine, has led to a sharp rise in energy costs for many households, highlighting the need for energy-efficient buildings. In response to this challenge, the EU Renovation Wave Strategy is not only meant to reach the climate goals, but also to **achieve greater independence from mainly imported fossil fuels** and to **help protect vulnerable households from energy poverty**. Yet, renovation costs, at least in the short-term, **might initially increase housing costs**, as the **investments only pay off in the longer term**.

This in-depth analysis sheds light on the interplay between construction and housing affordability, but also between renovation and affordability. Moreover, it highlights the main obstacles for more construction of residential dwellings as well as for the EU Renovation Wave. The paper is split into two parts. The first part discusses the opportunities and challenges of the construction sector and the implications of a shortage of housing on affordability are explained. Herein, slow productivity growth is derived as a key problem of the European construction sector and based on countries with a better productivity performance, best practice solutions are pointed out. Attention is also given to the scarcity of building land.

In the second part of this in-depth analysis, renovation is the central issue. After briefly describing the EU Renovation Wave Strategy, the implications of renovations on housing affordability as well as the barriers to renovations are discussed. This is followed by a discussion on 'housing rehabilitation' and its relevance for affordability.

PART I: CONSTRUCTION

2. THE EUROPEAN CONSTRUCTION SECTOR: CHALLENGES AND OPPORTUNITIES

The European construction sector is of great importance for the development of the economy. The construction industry includes both public and private construction of new buildings as well as renovations. One way of measuring the **size of the construction sector** is through the gross value added (GVA) generated by this economic activity as a share of total GVA[1]. According to Eurostat, this **share was between 5 and 6% in the EU in the period 2010 to 2021 and amounted in 2021 to a value of 5.5%**. Given that the construction sector is closely related to other sectors, as for example the construction sector is crucial for suppliers of insulation materials or for the concrete industry, the economic importance is even bigger. According to calculations by Grömling et al. (2024), the share of GVA in the German construction industry was 2 to 4 percentage points higher between 2000 and 2019 when the entire construction industry supply chain is taken into account. This was calculated for Germany, but it is also plausible that this is applicable to the European Union, given the similarities in construction industry structures and trends across EU Member States.

If **only the construction of new buildings** is regarded, the **GVA amounted to EUR 158.1 billion in 2021** (Eurostat, 2024). This equals a share of **1.7% of total GVA in the European Union**. Moreover, **3.3 million people have been employed in 2021**, **equalling 2.1% of the total workforce**.

Although the numbers are big, there is considerable potential for growth in the sector. All over Europe, there is a need for more investment in infrastructure, which predominantly will benefit the construction sector. For example, investment needs exist in residential construction. In the commercial property sector, by contrast, additional investment requirements – beyond renovation – usually arise only in specific cases linked to structural changes. Meanwhile, housing markets in nearly all metropolitan areas across Europe are under significant pressure (see Kholodolin et al., 2020). The sudden rise in interest rates in 2022 significantly reduced residential construction activity in the EU as a whole. According to data from Euro-Construct, which monitors construction activity in 19 EU countries, **the number of completed residential dwellings fell from just under 1.85 million units in 2022 to 1.57 million in 2024** (a drop of approximately 15%). Forecasts suggest (see Dorffmeister, 2025) that construction activity may decline even further, as the full effects of the interest rate shock become apparent only gradually.[2]

Another area with significant growth potential is the renovation of buildings. According to estimations by the European Commission (2020), the **estimated additional investment required for energy-efficient building renovation is around EUR 275 billion per year until 2030** in order to achieve the

[1] Gross value added (GVA) is defined as output (at basic prices) minus intermediate consumption (at purchaser prices).

[2] In quarter 1 of 2026, the European Commission plans to adopt a European Strategy for Housing Construction to support the construction sector to help it closing the gap between housing supply and demand. The strategy will set out the current situation, outline the main gaps faced by the construction supply sector, and proposes a set of measures to facilitate and increase the productivity and competitiveness of the construction sector.

55% emission reduction target. These investment costs include all costs associated with energy-efficient renovation, i.e. also the costs of maintenance investments.

The renewal of heating systems is also relevant. There are **currently over 129 million outdated boilers installed in the EU, more than half of which are inefficient** (Agora Energiewende, 2021). **By 2030, 60 million heat pumps are to be installed**, which will require further investment in infrastructure, power grids, and building adaptations (Lyons et al., 2022).

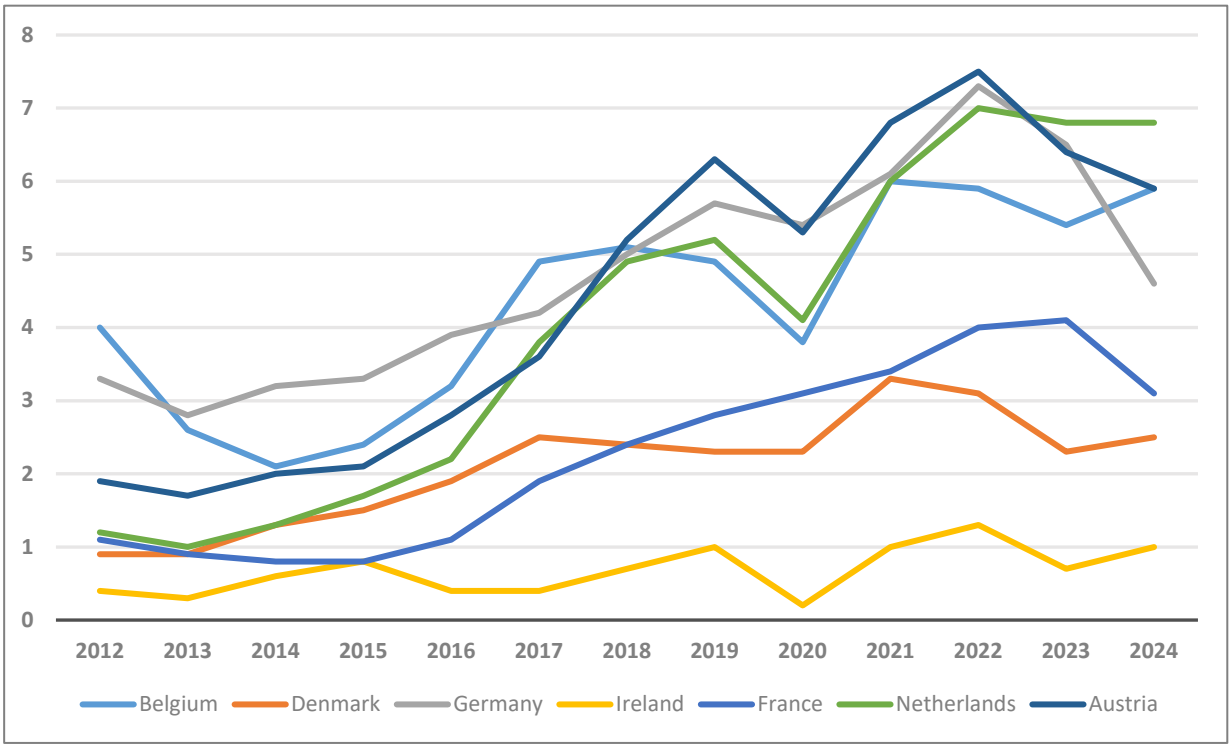
The construction industry is also very important for the labour market. **New industrial jobs could be created here, especially as industrial prefabrication**, i.e. building components, such as walls or floors, are made in a factory before being assembled on site, becomes more important.

Yet, to make use of its potential, the construction sector has to overcome its challenges. The following sub-sections outline the specific challenges that the sector is facing.

Labour shortages

Currently, **one of the main challenges is to gain employees**, specifically as the sector is not regarded as very attractive by young people. Despite a pronounced construction crisis as a result of sharply rising interest rates in 2022, the number of job vacancies has increased in many countries. Figure 1 shows the development of the share of job vacancies in total employment in the construction industry as an indicator of labour market developments in a number of selected countries.

Figure 1: Proportion of job vacancies as a percentage of all employees in the construction industry in % (in selected EU countries)



Source: Eurostat, Job Vacancy Rate (construction industry)

Figure 1 shows that between 2012 and 2024 it became more and more difficult for employers in the construction sector to find employees. Although in countries such as Germany, France, and Austria, the

figures are currently declining, reflecting the slump in construction demand. The **proportion of job vacancies is currently highest in the Netherlands at 6.8%, while the lowest numbers are in Denmark at 2.5% and Ireland at 1%**. Overall, the figures suggest that the labour market situation for the construction industry is most favourable in Ireland, but experts have also noted that it is very difficult to attract qualified applicants there (see Grömling et al., 2025).

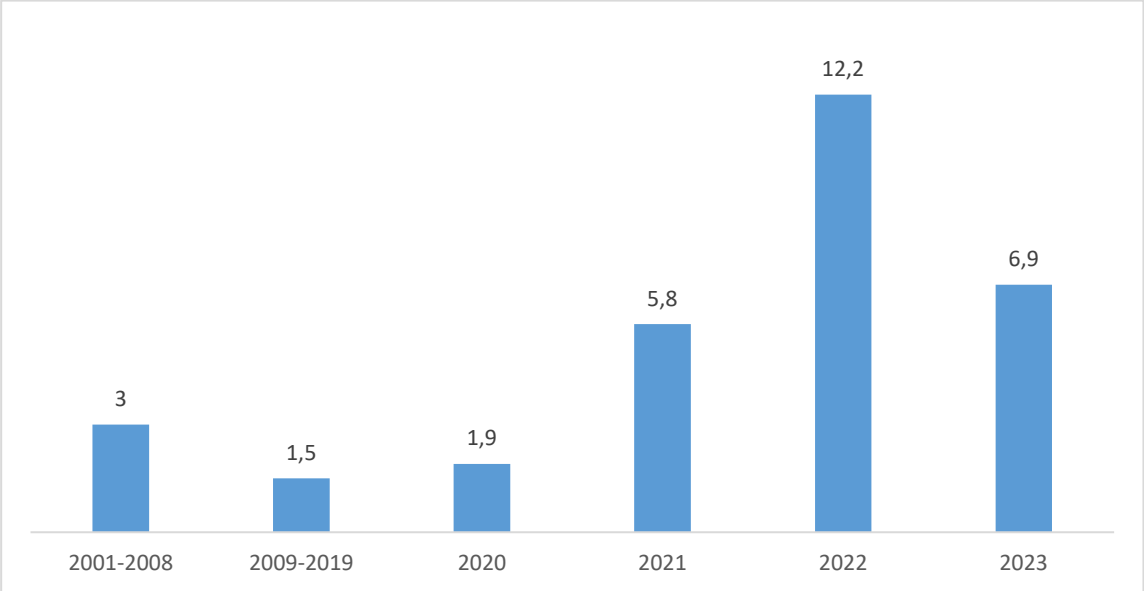
Building land scarcity

Availability of building land is a significant bottleneck in many countries, especially in times of rising construction demand. Especially in urban areas, building land is often scarce, as much of the space is already occupied by buildings and infrastructure. Moreover, **converting green spaces into building land is frequently met with resistance due to ecological reasons**, as excessive soil sealing[3] can have negative environmental impacts. In a recent survey among mayors in European cities, **60% stated that the limited land availability is a key challenge for housing affordability** (see EuroCities Pulse, 2025).

Rising construction costs

In the same survey of mayors in European cities, **71% of respondents said that rising construction costs are a main driver for the housing unaffordability**. Indeed, construction costs for new buildings surged in recent years. As Figure 2 illustrates, construction producer prices increased at an average annual rate of 1.5% between 2009 and 2019. This trend even accelerated significantly in 2021 with 5.8% and reached 12.2% in 2022.

Figure 2: Annual growth rates, construction producer prices for new residential buildings, 2001–2023



Source: Eurostat, Construction producer price and construction cost indices overview

Higher producer prices are due to a number of factors. The scarcity of labour is one, as employers have to pay higher wages to attract workers. Another factor are higher material costs, predominantly a result

[3] Soil sealing is the process of covering land with artificial materials like concrete.

of problems with supply chains during the Covid-pandemic, but also a result of a higher global demand for raw materials. Higher interest rates have also an impact, as the construction sector is dependent on loans to finance their projects.

As in other markets, higher prices make it less likely that customers buy a product. In the case of the construction sector, the higher prices coincide with rising interest rates, which dampened the demand for housing, for owners as well as for investors who want to rent out properties. As a consequence, the number of new built dwellings decreased significantly.

Fragmented regulations

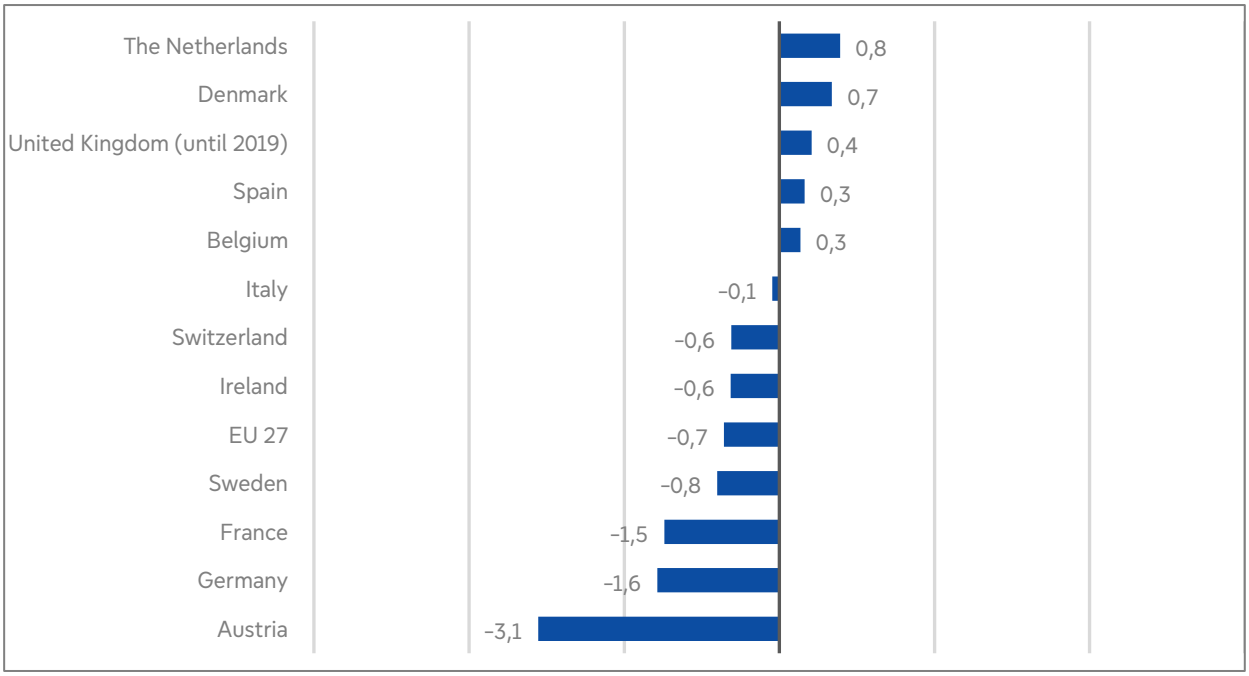
As noted earlier, rising interest rates substantially increase financing costs and thus negatively affect housing construction. However, interest rates and material costs are largely influenced by global economic forces, with political decisions exerting only limited indirect impact. In contrast, regulation and administrative processes in the construction sector represent domains where political action can directly reduce administrative burdens and improve conditions in the construction sector.

In the housing sector, clear and well-enforced regulations and standards are essential to prevent poor-quality construction and ensure minimum safety and quality requirements are met. Also, efficient administrative procedures are needed to ensure that regulations are properly implemented and followed. At the same time, **policies and regulations should encourage innovation, creating incentives for improved construction methods, better-quality housing, and more affordable options**. It is essential to **minimise the administrative burden on investors and ensure that administrative processes are as efficient as possible**.

Low productivity

A recent study of Grömling et al. (2025) examined productivity trends in the construction industry in detail for 12 European countries between 2005 and 2023 (shown in Figure 3). The 12 countries analysed are mainly Western and Southern European Member States, as detailed data for Eastern European Member States were not available. The in-depth analysis is therefore limited to these 12 countries, while Eurostat data were used to calculate a EU27 average.

Figure 3: Development of productivity in the construction industry in an international comparison



The numbers present the real gross value added per employee; annual average change in %, period 2005 to 2023.
Sources: Eurostat; German Economic Institute, Internationale Produktivitätsunterschiede in der Bauwirtschaft

Figure 3 shows that the period from 2005 to 2023 includes phases of rather strong and rather weak productivity in the countries. Striking differences emerge:

- Overall, productivity in the construction industry in the EU has developed unsatisfactorily. On average across the 27 EU Member States, **annual productivity fell by 0.7% per year between 2005 and 2023**. The trend in productivity was even worse in France (-1.5%), Germany (-1.6%) and Austria (-3.1%).
- **Some countries, however, went against the trend and increased productivity**. These include the Netherlands, Denmark, Spain and Belgium, as well as the UK, for which data is only available up to 2019.

As a consequence, the latter countries are specifically focused on in Chapter 4 when best practice examples for better regulation are discussed.

3. THE IMPACT OF RISING CONSTRUCTION COSTS ON AFFORDABILITY OF HOUSING

From an economic perspective, housing is generally considered a normal good, i.e. its price is determined by the interplay of supply and demand. Housing demand depends on the number of households and their ability to pay, either in rental markets or as housing purchasers. In turn, the ability to pay is determined by the income, since higher-income households tend to spend more on housing, whether to obtain more space or higher quality.

Accordingly, the **main drivers of changes in demand are shifts in household numbers and income levels – while financing conditions (particularly interest rates) are highly relevant for buyers**. Either, because households need a loan to finance a home or, in case they have enough equity, they could invest in the bond market and obtain yields which they do not receive when purchasing a home. As investors that intend to rent out residential homes also have to pay interest rates on loans and have to take into account foregone interest rates, the development of interest rates has also an impact on the rents. If interest rates increase, investors have to demand higher rents in order to meet costs, or if this is not possible, they refrain from investing.

Supply, in turn, is largely determined by construction costs. Construction costs are – as explained in the previous chapter - determined by the prices of building land, materials, and labour. In addition, due to long planning and construction times, financing costs are also an important component for the construction industry.

As a general rule, the stronger the rise in demand, the higher the prices for new buildings, which also has spill-over effects on existing properties, since for households existing properties are an alternative to new properties. Falling construction costs, on the other hand, lead to an expansion of construction activity and thus tend to cause new building prices to fall.

Against this background, the developments since 2020 can be illustrated. At first, **due to the Covid-pandemic, supply chains broke, which increased material prices considerably**. In 2022, Russia attacked Ukraine, which spurred the inflation rate as prices for wheat, oil and gas, among others, surged. A rising inflation rate also affects interest rates, as lenders want to be compensated for a decreasing purchasing power. Thus, not only has supply become significantly more expensive as a result of higher construction costs due to supply chain problems and an increasing inflation rate, but demand for buying new as well as existing dwellings has also fallen significantly due to higher interest rates. As a result, **transactions and new construction activity have slumped across Europe** (see for example Dorffmeister, 2025).

In general, increasing prices and rents are associated with decreasing affordability. From an economic point of view, the affordability is decreasing if income is not catching up with the cost of housing. The **combination of increasing rates and stagnating incomes, exacerbated by the Covid-pandemic, has decreased affordability across Europe** (see Biljanovska / Fu / Igan, 2023).

Impact on low-income households

A decreasing affordability especially has an impact on low-income households, which often have limited flexibility to meet rising housing costs and may be sometimes forced to reduce living space, accept lower housing quality, or allocate a larger share of their income to rent – or in the worst case lose their home at all. As a result, households often stay in apartments that do not fit to their needs which is referred to as over-crowding. According to Eurostat, a person is considered as living in an overcrowded household if the household does not have at its disposal a minimum number of rooms equal to: one room for the whole household; one room per couple in the household; one room for each single person aged 18 or more; one room per pair of single people of the same gender between 12 and 17 years of

age; one room for each single person between 12 and 17 years of age and not included in the previous category; and one room per pair of children under 12 years of age.

According to Eurostat, in 2024, **the overcrowding rate was 16.9% in the EU27**. Compared to 2020, this rate dropped by 0.5 percentage points, which is largely due to improvements in the housing situation in some Eastern European countries. However, **focussing on the Eurozone (20 countries), the rate increased from 12.5% in 2015 to 13.5% in 2020 and reached 13.7% in 2024**. In some countries, such as **Sweden, Ireland or Germany, the overcrowding rate increased by more than one percentage point between 2020 and 2024**.

Low affordability is relevant for purchasers of housing as well as for renters. Specifically since 2022, the low affordability of homes has resulted in a switch to rental markets, i.e. households which would typically purchase a home choose to rent. This switch to renting in combination with a drop in new construction has increased the tension in the rental market significantly. As a consequence, rental prices increased dynamically.

Even when low-income households are able to cover higher rents, they may nevertheless encounter barriers in the housing market. In that regard, some research suggests that landlords may prefer tenants with higher or more secure incomes, which can put applicants with limited financial resources at a disadvantage. Consequently, a declining affordability may be particularly problematic for certain social groups, such as low-income families, households with a migration background, or younger households.

Finally, low-income households and/ or otherwise deprived households are also disadvantaged in tensed housing markets (i.e. housing markets where demand for housing is much higher than the available supply), because investors might prefer to implement projects with higher margins and these are typically properties assigned for high-income groups.

4. HOW TO ENHANCE HOUSING AFFORDABILITY? – BEST PRACTICE EXAMPLES

The preceding chapters suggest that increasing construction of new residential dwellings is one important way to improve housing affordability. Expanding supply can help ease price pressures and the housing markets can become less tensed, so that it is easier for deprived households to get access to housing. However, it is important to note that simply increasing the overall supply of new homes may not be enough to address the housing affordability issue, as there is a risk that new construction targets higher-income households if affordability is not addressed. It is therefore essential not only to expand housing supply but also to ensure that these new homes serve a broad range of social groups, including low- and middle-income households.

In order to **increase construction activity, it is necessary to address a bundle of topics, specifically the building land scarcity issue and the low productivity of the construction sector**. **Productivity is a central issue for fostering affordability**, as more productivity means a higher output per employee. In a competitive sector like the construction industry, higher productivity will result in lower prices. Also, given the overall demographic trend, to overcome the shortage of labour seems to be more difficult, so that the

increase in productivity is even more relevant. The following paragraph presents measures that could help tackle the construction challenges (in most cases), illustrated by examples of best practices.

Building land

Urban areas are typically characterised by a higher population density and, as a consequence, building land is generally scarce. Additionally, building houses on green spaces is often met with resistance for ecological reasons, as soil sealing should be limited. However, when it comes to larger new housing projects, there is no way around the development of green spaces and Vienna with its Seestadt Aspern (Austria) and Copenhagen (Denmark) have shown that such urban expansion can also contribute to achieving ecological goals.

- In **Seestadt Aspern**, housing supply has been significantly expanded by combining residential areas with commercial and recreational spaces, providing subsidised housing, and following a long-term oriented urban planning approach. Ecological quality is ensured through standards such as the "Aspern Klimafit 2.0" building guideline, which sets strict limits and targets for the carbon footprint during construction (Baubook, 2025). This is complemented by a comprehensive mobility concept, featuring excellent metro connections, an extensive network of pedestrian and bicycle paths, and strong support for sustainable transport modes, including electric mobility and car-sharing infrastructure.
- The new **Nordhavn district** in Copenhagen follows the "Five-Minute City" model, where workplaces, shops, and leisure facilities are all within walking distance. The area is designed primarily for pedestrians, cyclists, and public transport, with cars pushed to the outskirts (Rose, 2024). As a result, individual motorised traffic is drastically reduced, leading to a significantly lower ecological footprint.

In addition, new construction projects can also be realised without causing additional soil sealing. One option is to **extend roofs or add storeys to buildings** and there is still great potential for this in many countries. Unlike in Scandinavian countries, in Germany, however, many multi-family houses are not extended due to more restrictive fire safety measures.

Also, the **conversion of commercial properties** offers great opportunities. Recent studies suggest that office buildings on the outskirts of some cities are becoming less necessary (see AEW, 2024), which opens up opportunities for new housing. Yet, experience shows that conversion of commercial property is often very expensive. Demolition and new construction, especially if it can be done cheaply, is often the better option. However, in order for these activities to get off the ground, not only are the necessary permits required, but also financial incentives.

In addition to financial incentives, **effective building land policy is crucial**, which must generally be implemented at the local level, as local authorities are best placed to decide on local needs. Higher-level authorities must, however, enable local authorities to make decisions based on their needs. This includes financial resources, as new residential areas also require additional investment in infrastructure.

Finally, as explained before, investors tend to build new homes for high-income households if there is a shortage of land. To ensure that property developers also build for other social groups, concept-based allocations can be a useful tool. **Concept-based allocations** mean that land is not sold to the highest bidder, but instead buyers must meet specific requirements regarding the type of development. For example, it may be required that a particularly high number of small or simple apartments be built. A quota of social housing units can also be mandated. In Germany, the city of Hamburg has achieved considerable success with this approach.

Drivers for productivity growth

The following four measures could boost productivity in the construction sector.

- **Digitalisation and integrated planning**: Countries with higher productivity are consistently working to overcome the traditional separation between the planning and designing of the building and the actual construction. More importantly, however, planning and construction are seen as communicating channels in which necessary adjustments can still be made during the construction process. This requires greater cooperation between clients, planners, and construction companies. In Ireland, the position of a planning counsellor has been introduced to overcome frictions between these stakeholders. Moreover, digitalisation is a key enabler for better coordination between planning and construction. For example, by using a common digital model, different parties involved (e.g. architects, electricians) can work together more effectively and avoid errors, as they can access and share accurate and up-to-date information about the project's design and construction plans. In this context, Building Information Modelling (BIM) has the potential to provide higher quality and productivity (see Gharaibeh, 2024) as well as improve safety in the construction industry (see Fargnoli & Lombardi, 2020). BIM means that a building is digitally modelled in 3D from the outset, allowing all project participants, including planners, clients, and subcontractors, to access and share complete information from the very beginning. By leveraging digital tools like BIM, construction can also offer more dynamic and less repetitive work, fostering creativity and innovation which can help to attract more skilled labour. BIM is a standard technology in many countries, however, in some countries this is still regarded as a new technology and could be therefore rolled out more.

  While fast internet has been available on every construction site in many European countries, such as Denmark, the Netherlands, and Belgium for 10 to 15 years, Germany and Austria have yet to achieve the same level of coverage nationwide. In addition, in countries with higher productivity in constructing buildings, permits are fully digital, allowing for fast processing, while in countries with lower productivity, the digitisation is lagging behind. According to data from the European Commission, Germany ranks only 22nd among EU countries in the adoption of digital public administration solutions for businesses, while Ireland holds 2nd place, and Belgium and Spain are also among the top ten.

- **Replication of residential buildings**: Replication (i.e. repeatedly constructing similar building designs) is a significant driver of productivity (see Zouhourian et. al., 2025). The more often a building or even a component is replicated, the more efficiently and cost-effectively it can be

constructed. This is not deliberately referring to industrial prefabrication[4] but rather to replication in general, as efficiency gains can also be achieved through replication in traditional construction. However, replication requires that it is approved, preferably in as many municipalities as possible. In the Netherlands, investors can be certain that buildings approved in Utrecht, for example, can also be built in other parts of the country.

In other countries, municipal or state regulations often prevent replication. Denmark, in particular, has demonstrated in the past that testing replication and industrial prefabrication in individual areas such as social housing is also a good way of increasing acceptance of this construction method. Large-scale contracts for social housing that utilise replication and industrial prefabrication could help to reduce construction costs and increase the affordability of housing for low-income households. In addition, prefabrication is also a means to attract new workers. A study by Sharma et al. (2025) has shown that prefabrication can improve safety in construction, improve the lifestyle of workers, reduce obstacles to increased female participation in the workforce, and open up opportunities for less highly skilled employees to enter the construction sector.

- **Setting targets instead of standards**[5]: Innovation is a key driver of productivity gains. For companies to invest in innovation, they need to be sure that they can implement it. In private housing construction, in particular, compliance with the state of the art is a major obstacle to innovation as it can limit the adoption of new innovative technologies or processes. Of course, standards will evolve over time, adjusting to new technologies, but this happens very slowly, and low-cost construction, in particular, is hardly taken into account. Successful countries rely on targets rather than rigid standards, allowing the construction industry itself to decide how to achieve them. This creates a continuous incentive to find better and cheaper solutions. Therefore, rather than prescribing exact specifications for how something should be constructed (standard), it is more appropriate to define the quality level to be achieved (target).
- **Continuous training of employees**: Employee training is another productivity driver. However, training can be a competitive disadvantage in the short term because employees are not available to work while they are undergoing training. A joint commitment to continuous training is therefore needed, as has been successfully achieved in Belgium, for example. All companies in the Belgian construction sector are required to contribute a share of their revenue to the funding of Volta, the Centre de Recherches Routières (BRRC), and Buildwise. Volta focuses primarily on research in the field of electrical engineering, the BRRC specialises in road construction, and Buildwise covers the construction sector more broadly. In addition to applied research, all three institutions also serve as expert advisors to companies on specific issues and offer training and continuing education programmes. This funding model ensures that all construction companies have access to the latest technologies and guarantees ongoing professional development for all employees, including those in small enterprises (see Grömling et. al., 2025). Ultimately, it is crucial for all countries to establish a culture in which training and continuous improvement are seen as a standard practice.

[4] Prefabrication in construction refers to the process of manufacturing building components (such as walls, floors, roof panels, or entire modules) in a controlled factory environment, which are then transported to the construction site for quick assembly.

[5] Targets: Specific, measurable goals or objectives that companies aim to achieve (e.g. "reduce energy consumption by 20%"). Standards: Mandatory requirements or rules that companies must follow (e.g. "all buildings must meet a certain energy efficiency rating").

PART II: RENOVATION

5. EU RENOVATION WAVE STRATEGY

5.1 Short summary of the strategy

The EU's Renovation Wave Strategy, presented in October 2020 as part of the European Green Deal, aims to substantially improve the energy efficiency of existing buildings (see European Commission, 2020). The strategy aims to **at least double the annual renovation rate by 2030**, with a focus on deep renovations that achieve substantial energy savings. All in all, **35 million buildings shall be renovated** by 2030.

The focus is primarily on residential buildings with low energy efficiency, public buildings, and those with high social relevance, such as schools and hospitals. The strategy emphasises **the need for an integrated approach** that includes **regulatory measures** (e.g. minimum standards for overall energy efficiency), targeted **financing instruments** (including from the EU's Recovery and Resilience Facility and the InvestEU initiative) and the boosting of planning capacities and new technologies.

For the **residential building sector**, this means a **combination of mandatory measures** (e.g. expansion of energy performance certificates, introduction of renovation pathways) and **incentives to mobilise private investment**. At the same time, the **strategy emphasises social aspects: low-energy households are to receive special support and a fair distribution of the renovation burden is to be ensured**.

The renovation wave is considered a key lever for achieving the goals of the EU's "Fit for 55" climate package while creating jobs and improving quality of life. It will be implemented in close coordination with the revision of the Energy Performance of Buildings Directive, the amendment to which was adopted in 2024.

5.2 Impact of the renovation wave on sustainability and energy efficiency of housing in the EU

Improving the energy efficiency of residential buildings in the EU reduces energy consumption and thus lowers carbon dioxide emissions. Moreover, lower energy consumption decreases the EU's dependency on energy imports.

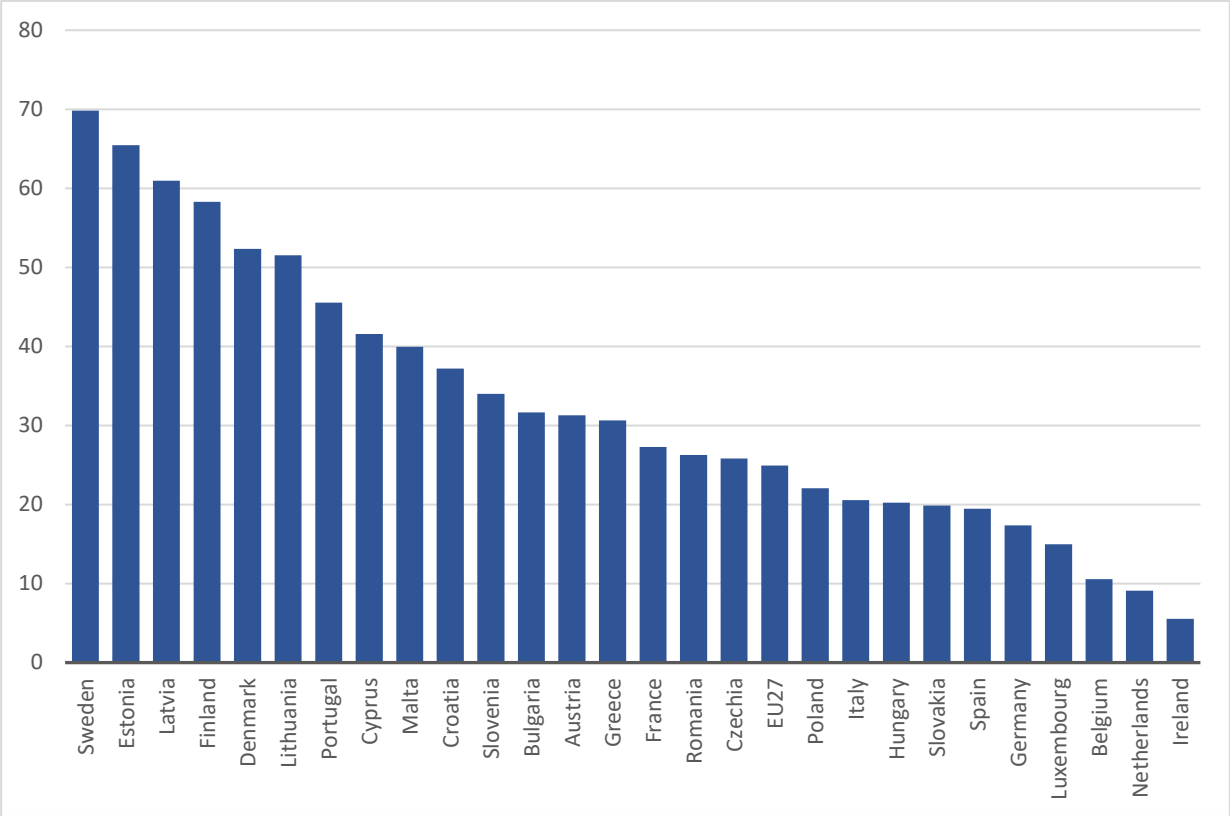
However, as of now, the renovation rate in the EU remains low. Currently, the **annual energy-related renovation rate stands at only about 1% of all residential buildings**, while **"deep" renovations — those achieving energy savings of at least 60% — account for just 0.2% of residential buildings per year** (see Maduta et al., 2023). Yet a **rate of around 2% is necessary**, which is also the target of the EU's Renovation Wave.

In terms of building age, approximately 85% of the EU's building stock was constructed before the year 2000 and around 75% of these buildings have poor energy performance. Another estimate indicates that 35% of residential buildings fall into energy efficiency classes D to G, with G being the least efficient category (see RICS, 2020).

These figures reveal a significant discrepancy: a substantial proportion of buildings remain energy-inefficient, yet the renovation rate lags behind. To meet the EU's climate goals — such as climate neutrality by 2050 — **much higher renovation rates are required**, particularly in the area of **deep energy retrofits**, which currently make up only a **marginal share (0.2%)**.

However, it is also important to recognise that **climate neutrality does not depend solely on improving the energy efficiency of buildings**. The decisive factor is the ability to **use renewable energy sources**. Yet, there are considerable differences between the various Member States (as can be seen in Figure 5).

Figure 4: Share of renewable energy in household energy demand for heating and air conditioning, in %, 2022



Source: Eurostat, 2025, Share of energy from renewable sources

The share of renewable energy for heating and air conditioning is highest in the Scandinavian countries and the Baltic states, at over 50%, as Figure 5 shows. For a successful transformation of the EU building stock, both improved energy efficiency and a strong expansion of renewable energy sources are therefore essential.

With regard to energy efficiency, however, it is also **crucial to maintain an appropriate balance between marginal benefits and marginal costs**. Renovations aimed at achieving top-tier energy efficiency classes, such as A and B, are often associated with very high costs. Yet such a high efficiency standard is not even necessary to make use of renewable energy sources (see OECD, 2023). It is therefore appropriate that the EU Renovation Wave focuses on buildings with the poorest energy

performance. Renovating buildings with very poor energy efficiency usually entails higher upfront costs, but the significantly larger energy savings generally result in a more favourable cost–benefit ratio than in the case of buildings with medium energy efficiency. In addition, replacing heating systems is particularly important in enabling the use of renewable energy.

6. BARRIERS TO RENOVATIONS

As already mentioned, renovating existing buildings requires considerable investment, which have to be borne primarily by the building owners. Even if the investments pay off in the long term, the investment costs may be too much for some owners. This is particularly the case given the sharp rise in interest rates and renovation expenses in recent years – overall, the economic and financial conditions for both construction and renovation have deteriorated considerably.

It should also be noted that the current financial market regulations make it more difficult to obtain loans. In response to the global financial crisis, the EU introduced stricter rules to make banks more stable (see Gutiérrez de Rozas, 2021). The positive effects of these regulations is reflected, among other things, in significantly lower default rates on residential loans (i.e. fewer homeowners are failing to make their mortgage payments), even despite the rise in interest rates in 2022, which normally makes it harder to pay back loans. Despite the progress made, banking regulations are tightened further. Because stricter rules limit the use of banks' internal risk models, they will have to provide more of their own capital when granting loans. This also applies to loans for renovations. To attract this additional capital, banks need to offer higher returns to investors, which raises lending rates. Higher interest rates then reduce demand for new construction and renovation projects.

The issue of financial market regulation is complex and would warrant a separate report. However, as the Draghi Report (Draghi, 2024) pointed out, there is a conflict of goals between higher investment and restrictive regulation. That means that tighter lending standards increase financial stability as they reduce risks for banks. However, they may come at the cost of limiting socially beneficial projects as it makes it harder for some projects to receive funding. This dilemma also applies to the housing market, as shown by Demary et al. (2025), for example.

Besides, there are further obstacles for improving the pace of renovations in the EU:

- **Shortage of skilled workers, especially heating engineers**: There is a shortage of skilled workers in the construction industry as a whole, which has already been pointed out, but the shortage of heating engineers is particularly acute. In Germany alone, bottleneck analyses show that only around one in ten positions can be adequately filled (see Tiedemann, 2025), although less heating systems have been modernised than needed to reach climate goals. This means that if demand is surging, the shortage will be even more pressing. Efficient solutions are therefore needed to replace fossil fuel heating systems. Simultaneously renovating blocks of apartments or one-family homes could be a way to increase efficiency.
- **Older owners**: In all European countries, the home ownership rate among older households is particularly high and the proportion of landlords is also particularly high in this group. However,

energy-efficient renovation is often unattractive for older households, as the expected payback period of 10 to sometimes 30 years exceeds their life expectancy (see for example Abreu et. al., 2020). In addition, some households are subject to a limited access to loans, especially in regions with a shrinking population. In general, it seems difficult to motivate older households to undertake comprehensive renovations, even with higher subsidies. Instead, the focus should be on the next generation. One idea could be to require or incentivise households that inherit a property to carry out a renovation. In the Scandinavian countries, positive results have been achieved by obliging heirs to obtain an energy assessment, which also included a potential renovation roadmap. In general, the likelihood of an energy-efficient renovation is highest when a property changes ownership, whether through inheritance or purchase, since the new owners are often planning to invest in the property anyway. This process can be further supported through targeted subsidies.

- **Shrinking regions**: In growing regions (i.e. areas where the population and/or economic activity are increasing over time), there is generally a stronger incentive for energy-efficient renovations, as there is greater demand for residential property. It is therefore more likely that investments will lead to higher property values. In contrast, demand is declining in shrinking regions and many property owners fear that there will be no new users for their buildings. As a result, the willingness to invest in energy efficiency is significantly lower. In this context, it must be expected that, despite higher CO_2 pricing, some buildings in regions with low demand will remain unrenovated or receive only limited energy-efficiency improvements. While subsidies can help, they are costly and carry the risk of supporting properties that may become vacant in the future.
- **Lack of transparency**: In many EU countries, tenants and buyers receive limited information about a building's energy efficiency and necessary renovations. In addition, the available information is often not comparable, as consumption and demand certificates are presented together, but the underlying calculations differ widely. A uniform European energy performance certificate would improve clarity and transparency for tenants, buyers, and investors, and would also enable more effective monitoring of energy efficiency progress across the EU.

7. RENOVATIONS AND AFFORDABILITY

Energy-efficient renovations play a key role in addressing energy poverty and have a strong social impact. **Energy poverty** – the inability to afford adequate heating, cooling, or lighting – **affects between 8% and 16% of the EU population, which equates to around 35 to 72 million people** (Cornelis, 2024). In countries such as Portugal, Bulgaria or Greece, more than 20% of the population are unable to keep their homes adequately warm.

Energy renovations, by reducing heat loss and lowering heating costs, directly alleviate energy poverty. As energy demand drops, so does the financial burden on low-income households—especially those living in older and poorly insulated buildings. Furthermore, the indoor climate improves, reducing health risks associated with cold and damp living conditions and promoting social inclusion.

However, energy renovations also pose short-term social risks: the investment costs—for insulation, new windows, or heating systems—can temporarily raise housing costs, either through rent increases or higher loan payments for owners. Low-income households are especially vulnerable, as they are disproportionately housed in older, energy-inefficient buildings and often lack the financial reserves needed to finance such investments. In some Eastern European countries, for example, comprehensive renovations have led to so-called 'renovictions', i.e. the displacement of the actual users (see Feantsa, 2022).

Therefore, **social compensation measures are essential to align renovation policies with social protection**. One effective approach is to use revenues from carbon pricing to support low-income households, either through direct transfers or by funding targeted renovation programmes.

Across the EU, using carbon pricing revenues for social compensation presents a promising strategy to reconcile climate policy with social equity. Studies suggest that **allocating just 30% of carbon revenues could be sufficient to adequately compensate low-income households**. The precise design and implementation of such measures, depends, however, on the specific socioeconomic context (see Muth, 2023).

The following solutions can be recommended from other countries regarding social compensation measures:

- **Switzerland** is a pioneer in this regard: since the introduction of its CO_2 tax on fossil fuels in the building sector in 2008, about two-thirds of the revenues have been redistributed directly to households and businesses, while the remainder supports energy efficiency programmes. These transfers are partly implemented through deductions in mandatory health insurance premiums, making the system widely supported by a broad range of sources.

- **Sweden** also operates a comprehensive system of housing and heating subsidies, which supports low-income households while promoting energy renovations and the use of renewables (see Janikowska et. al., 2024).

8. THE IMPACT OF HOUSING REHABILITATION ON SUSTAINABILITY AND AFFORDABILITY

Housing rehabilitation—the revitalisation of currently unusable or vacant buildings—presents both opportunities and challenges across European contexts. Rather than focusing solely on the improvement of the existing occupied housing stock, rehabilitation targets properties that have fallen into disuse or disrepair. By restoring such buildings to habitability, housing rehabilitation contributes to **increased housing availability**, particularly in **urban cores or regions experiencing demographic or economic shrinkage**.

- In **Lisbon, Portugal**, a focused programme to rehabilitate 1 674 vacant buildings between 2009 and 2022 led to the reoccupation of approximately 60% of them. This not only increased housing availability but also revived local economies, with commercial unit occupancy

increasing by 166% in the same districts. However, a notable share of these rehabilitated units entered the short-term rental market, indicating a need for regulation to ensure long-term affordability (see Rodrigues et. al, 2024).

Housing rehabilitation has a clear **local economic impact**. It stimulates demand for skilled labour, construction materials, and green technologies, especially in energy retrofitting. The refurbishment of neglected buildings contributes to a reduction in vacancy, supports the construction sector, and can catalyse innovation in industrially prefabricated retrofitting techniques and sustainable building materials.

- A case study from **Chantepie, France**, demonstrates this dual benefit: retrofitting 30 social housing units resulted in 60% reductions in energy use and significant cost savings for residents. The project, supported by the European Investment Bank and *Caisse des Dépôts* (a French public financial institution), also piloted advanced insulation materials and digital monitoring systems (Knight, 2025).

While the potential of rehabilitation is significant, the affordability challenge must not be underestimated.

- Rehabilitation—particularly deep energy retrofits—involves **high initial investments** that can lead to increased rents or property values. This can even result in the displacement of low-income residents, as has already been pointed out.

- Moreover, **older or disabled populations may not benefit** from rehabilitation if the restored buildings do not meet accessibility standards. In such cases, demolition and new construction may be more appropriate—not only to achieve higher energy efficiency, but also to provide barrier-free environments suited to ageing populations. Hence, urban renewal strategies must be flexible, allowing for a combination of rehabilitation and selective demolition and reconstruction where justified.

In conclusion, housing rehabilitation offers a viable and sustainable path to address housing shortages and support local economic revitalisation. However, it **must be pursued within a broader strategic framework that safeguards affordability, incorporates accessibility, and allows for new construction** where necessary. Best practices from across Europe, like the examples given on Lisbon and Chantepie, highlight how **targeted financing, regulation, and integrated planning can make housing rehabilitation a central pillar** of equitable urban development.

9. CONCLUSION

9.1 Summary of key findings

In order to improve housing affordability in the EU, the construction sector is of great importance. Increasing the number of residential dwellings can help ease supply pressures in the market. However, it is crucial to ensure that new constructions address the needs of a broad range of social groups, not only high-income households. Even though, it is possible that the construction of more expensive dwellings could lead to some benefits for low-income households through the filtering effect. The filtering effect means that through moving chains, units in the lower price segment become available as higher-income households move into the newly built properties. However, this process is neither automatic nor sufficient on its own to ensure affordability. Furthermore, while increased renovation activities can reduce fossil fuel dependency and help households to overcome energy poverty, targeted policies and initiatives are needed to ensure that the benefits of new construction and renovation are shared equitably among all income groups.

However, the construction and renovation sector are facing structural challenges.

- Due to the demographic change, the labour force is shrinking. Also, construction costs increased significantly, and demand declined because of increasing interest rates. Thus, a productivity growth is essential to ensure that more housing is built and to conduct more renovations. Improving productivity in the construction sector is therefore crucial for making new buildings and renovations more affordable. By becoming more productive, the construction sector can reduce costs and deliver the necessary quantities to meet growing demand and support political goals.

- Reducing renovation costs could help alleviate some of the barriers that currently hinder renovation. Therefore, it is necessary to design a framework that allows for more scaling and innovation in the construction sector. Some best practice examples from the Netherlands, Belgium, Ireland and other countries, like focussing on targets instead of standards, implementing of digital solutions and prefabrication, are presented in this briefing, but more research and more attention to this topic is needed.

The in-depth analysis highlights significant barriers to renovation that have to be addressed. While low-income households can ultimately benefit from renovations and escape energy poverty, they may face a significant increase in housing costs in the short term, even though the investment will pay off in the long run. To avoid exacerbating the issue of rising housing costs, a compensation scheme is necessary. Furthermore, additional support is needed to encourage older house owners and those in rural areas to undertake renovations, as they often face unique challenges. Further research is required to address these issues, as they are crucial to achieving the desired policy outcomes.

All in all, the in-depth analysis points out that the potentials for the construction sector are great, but challenges are manifold. Therefore, it is even more helpful to learn from each other and to identify best-practice examples for improving the framework. For the future, Member States should co-ordinate their

policies to develop a cross-country construction market, so that the sector gains more potential for scaling-up its business.

9.2 Policy recommendations

Recommendations for tackling the challenges related to construction:

- **Low productivity** limits output and drives up construction costs. Countries such as the Netherlands and Denmark show that digitalised permitting, integrated planning, and replication of already existing designs can cut costs and boost efficiency.
- **Labour shortages** require sector-wide training schemes and more attractive working conditions (like prefabrication, i.e. building components, such as walls or floors, are made in a factory before being assembled on site) to attract new groups of workers.
- **Land scarcity** in urban areas calls for better allocation schemes that ensure the provision of affordable homes. This can be achieved through, for example, concept-based allocation, where land is allocated based on specific development requirements, such as prioritising small or simple apartments and mandating a quota of social housing units, rather than being sold to the highest bidder. Moreover, the conversion of commercial buildings into housing could be facilitated.
- **Expanding the supply of building land is essential** for creating affordable housing. Policymakers could also make greater use of urban densification measures, including adding additional floors to multi-family buildings and converting attics, to increase housing capacity efficiently.
- **Fragmented regulations** hinder an increasing output in construction; harmonising rules nationally and eventually across the EU could foster more innovation and would help the construction sector reduce costs, for example with the use of prefabrication.

Recommendations for tackling the challenges related to renovation:

- **High investment costs and stricter banking rules** reduce access to credit; targeted subsidies and use of carbon pricing revenues can shield low-income households from rent or cost increases. Low-income households are especially vulnerable, as they are disproportionately housed in older, energy-inefficient buildings and often lack the financial reserves needed to finance such investments. In some Eastern European countries, for example, comprehensive renovations have led to so-called 'renovictions', i.e. the displacement of the actual users. In these cases, across the EU, carbon pricing revenues could be used to adequately compensate low-income households.
- **A challenge in improving energy efficiency is balancing the costs and benefits of renovations**, as renovations aimed at achieving top-tier energy efficiency classes, such as A and B, are often associated with very high costs. In contrast, renovating buildings with very poor energy efficiency usually entails higher upfront costs, but the significantly larger energy savings generally result in a more favourable cost–benefit ratio than in the case of buildings

with medium energy efficiency. Therefore, worst-performing buildings could be prioritised, as they achieve the highest energy and affordability gains.

- **Skilled labour shortages**, especially of heating engineers, can be addressed through targeted training and by bundling retrofitting activities. Additionally, rolling out more digital tools, such as Building Information Modelling, could both boost productivity and attract more skilled workers, especially younger professionals, to the construction and renovation sectors.
- **Lack of transparency on energy performance** could be addressed through harmonised EU-rules on energy performance certificates.
- **The home ownership and landlord rate is particularly high among older households** in all European countries. However, energy-efficient renovation is often unattractive for older households, as the expected payback period of 10 to sometimes 30 years exceeds their life expectancy. Policymakers could therefore use property transfers as trigger points for energy-efficient renovations by linking them with targeted subsidies or regulatory incentives. Regarding the inheritance of property, in the Scandinavian countries, positive results have been achieved by obliging heirs to obtain an energy assessment, which also included a potential renovation roadmap.

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The construction sector plays a key role in fostering economic growth and ensuring housing affordability. However, the sector faces many challenges. Designing a framework that allows for productivity growth is essential, especially since the labour force is shrinking. Moreover, solutions have to be found for the land shortage issue and the disincentives to renovations for older or low-income households, which are unable to bear investment costs.

This in-depth analysis discusses the key challenges of constructing new residential dwellings and renovating existing ones, discusses implications for housing affordability, and presents policy recommendations to address these issues. Housing rehabilitation is also briefly discussed.

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