



E3G

**REPORT** OCTOBER 2024

# FUTURE-PROOF BUILDINGS FOR ENERGY SECURITY AND FISCAL STABILITY

## TEN RECOMMENDATIONS FOR A SUCCESSFUL DECARBONISATION OF BUILDINGS IN THE EU

**FLAMINIA BONANNI & VILISLAVA IVANOVA**





# E3G

## About E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

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### Cover image

A Soviet-era housing unit in Szczytno, Poland that has been regenerated with photovoltaic panels and a heat pump system.

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## SUMMARY

Decarbonising the EU's building stock is an integral part of Europe's green transition. Beyond the important contribution to climate action, decarbonising Europe's buildings will enhance energy security and resilience, foster economic and fiscal stability, strengthen the EU's competitive advantage in key clean industry sectors, and help improve quality of life for Europeans. Now is the time for EU institutions and member states to implement existing regulations and launch new initiatives to deliver this potential.

Delivering a fast, fair and funded decarbonisation of the EU's building stock should remain a political and infrastructure priority. Buildings are at the heart of the energy system, construction industry and financial sector. Decarbonising the building stock is a pivotal step in meeting long-term binding climate targets. By cutting dependency on fossil fuels, it is also an important contributor to improve energy security and fiscal stability.

There is political momentum to future-proof Europe's building stock. Continuing the clean energy transition is a priority for the incoming European Commission, which for the first time will have a European Commissioner for Energy whose portfolio also covers housing. This political development is a unique opportunity to drive policy integration at the nexus of energy efficiency, energy security, the just transition and buildings decarbonisation. For member states, implementation of the newly agreed Energy Performance of Buildings Directive (EPBD) will be critical to mainstream energy efficiency policy, facilitate the deployment of clean technologies and improve wellbeing for households.

Delivering tangible change over the course of the next institutional cycle will require improved coherence among policymakers. This report sets out ten recommendations for the European Commission and member states to deliver buildings decarbonisation at pace and ensure the transition creates wider social benefits.



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## Ten recommendations to deliver buildings decarbonisation in the EU

### Contributing to energy security and resilience

- 1 Put clean heat and energy efficiency at the core of any new definition of energy security** developed by the European Commission.
- 2 Promote a stronger EU approach to material efficiency and circularity** for critical raw materials with the new Circular Economy Act.

### Enhancing macroeconomic stability

- 3 Fast-track the implementation of the Energy Performance of Buildings Directive** and plan well-designed economic and fiscal incentives at member state level to speed up the deployment of efficiency measures and clean heat technologies.
- 4 Launch a study assessing the impact of the energy transition on the European economy** in terms of fiscal risks and benefits.

### Using and supporting the financial system

- 5 Encourage European financial institutions to mainstream blended finance schemes** supporting buildings decarbonisation (e.g., low-interest loans) and play the role of guarantor with national banks.
- 6 Encourage private banks to establish risk-management and investment strategies** for their real estate portfolio that take into account energy performance data, including Energy Performance Certificates and Renovation Passports.

### Tapping into industrial potential & competitiveness

- 7 Boost the role of heating and cooling as an industrial cluster within the energy efficiency ecosystem.** Create a comprehensive legislative framework with the review of the Heating and Cooling Strategy, complemented by the publication of the Heat Pumps Action Plan.
- 8 Expand the scope of the European Innovation Council** to consolidate innovative business models making clean heat technologies accessible to consumers.

### Realising health and social benefits

- 9 Enshrine healthy, affordable and energy-efficient homes as a fundamental social right.**
- 10 Provide a European template identifying common overarching criteria** for designing grants and funding schemes and use National Building Renovation Plans across member states.



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# CHAPTER 1

## CONTRIBUTING TO ENERGY SECURITY AND RESILIENCE

### Decarbonised buildings can improve energy security

The clean energy transition presents an opportunity to move beyond the volatility of fossil fuel prices. The past two years have been a stark reminder of both the perils of dependence on a single energy exporter and the risks to energy security posed by the continued reliance on fossil fuels. REPowerEU has been useful to provide a temporary response to energy price shocks and needs to be built upon to deliver a structural shift to a clean energy future.

As the transition to a clean energy system continues, energy security will become anchored to principles of flexibility, efficiency and circularity, and balancing massive renewable energy deployment with demand-side action. The crisis teaches us that a supply-driven conception of energy security is no longer sufficient to protect citizens. Rethinking how we approach energy system integration would decrease risks related to future foreign supply disruptions, and improve economic resilience by decreasing economic sensitivity to energy shocks.<sup>1</sup> A new framework for energy security should shift from narrow focus on supply, and incorporate demand-side considerations, to reflect the contemporary and future energy realities (Figure 1).

#### Changing the energy security paradigm

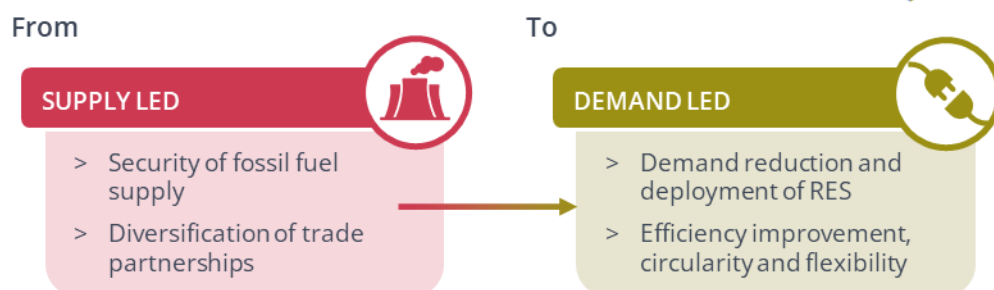


Figure 1: The EU needs to shift how it thinks about energy security, framing it more in terms of energy demand and how this can be managed.

<sup>1</sup> IMF, 2024, [The Energy Security Gains from Strengthening Europe's Climate Action](#)





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**Decarbonising buildings is a fundamental part of the energy security puzzle,** given that 30% of the final energy consumption in households is still provided by fossil gas, and heating represents close to two-thirds of their energy use.<sup>2</sup> The EU can save between 21 and 44 billion cubic metres (bcm) of imported gas every year by 2033–2035<sup>3</sup> if it accelerates heat pump and clean district heating roll-out. By comparison, the EU imported 42.9 bcm from Russia in 2023 (Figure 2). According to estimates, increasing the uptake of heat pumps to 60 million by 2030 and improving buildings renovation rate from 1% to 3.5% can allow the EU to save €60 billion in fossil fuel imports between 2022 and 2030, including €43 billion on gas imports.<sup>4</sup>

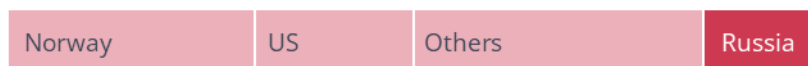
### Decarbonising buildings is good for the EU’s energy security

EU gas consumption in 2023 was 330.4 bcm.



Decarbonising heating can save **21–44 bcm gas per year** by 2033–2035, thereby significantly contributing to decreased demand.

EU gas imports by share in 2023.



For example, the EU **imported 42.7 bcm from Russia** in 2023.

Sources: EU gas consumption from Eurostat, updated 3 October 2024, Supply, transformation and consumption of gas – monthly data; Savings potential from Guidehouse, March 2024, Policy brief update: Energy security impacts of renovating the EU’s worst performing buildings; EU gas imports from European Council, updated March 2024, Where does the EU’s gas come from?



*Figure 2: Just decarbonising how the EU heats its buildings can lead to gas savings of a similar magnitude to current gas imports from Russia.*

<sup>2</sup> Eurostat, June 2024 (updated), **Energy Consumption in households**

<sup>3</sup> Guidehouse, March 2024, **Policy Brief Update “Energy security impacts of renovating the EU’s worst performing buildings”** (PDF)

<sup>4</sup> EHPA - Cambridge Econometrics, April 2023, **Europe’s leap to heat pumps: The socio-economic and climate benefits unlocked by a fast heat pump roll-out**



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**Switching to renewable and waste-based district heating can also deliver substantial savings to fossil fuel imports.** District heating (DH) currently meets about 13% of the final energy use for heating and hot water in households,<sup>5</sup> with 67 million citizens depending on it.<sup>6</sup> By using local sources and recovered heat from waste, further deployment of DH could cover up to 20% of the demand by 2030 and save 24 bcm of gas both through infrastructure modernisation (6 bcm) and by plugging in renewables and clean heat (18 bcm).<sup>7</sup> With a correct implementation of the EU decarbonisation scenario by 2050, DH could increase heat demand coverage from 15% in 2020 to 31% in 2050,<sup>8</sup> as additional local heating sources contribute to reduced reliance on gas.

## Low-carbon heating technologies can be a test case for adopting circularity

The EU's high critical raw material dependency calls for ongoing policy and industry effort to improve supply chains and adopt circularity principles. According to WTO data, in 2022, the EU stood as the second largest global importer of critical minerals (16%) after China (33%).<sup>9</sup> The uptake of clean technologies has already led to spikes in demand for cobalt, copper, lithium, nickel and rare earths, compared to the past 20 years (from US\$53 to 378 billion). This trend is likely to continue as the transition accelerates, which will put further strain on global supply chains and impact importers like the EU.

Low-carbon heating technologies are not immune to critical material price volatility but have substantial supply chain flexibility, which needs to be fostered. Technologies like heat pumps require copper, aluminium, zinc, stainless steel and nickel, which can make manufacturing sensitive to volatility in metals prices, the global shortage of semiconductors and import dependency on permanent magnets.<sup>10</sup> However, heat pumps and gas boilers show similarities in the use of

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<sup>5</sup> Clean Heat Europe, 2024, **How can Europe fill the clean heat gap?**

<sup>6</sup> Euroheat & Power, 2023, **Fit for 2050: Unleashing the potential of efficient district heating and cooling to decarbonise Europe**

<sup>7</sup> Ibid.

<sup>8</sup> Fallahnejad et al., 2024, **District heating potential in the EU-27: Evaluating the impacts of heat demand reduction and market share growth**, *Applied Energy*, vol. 353 pt. B, 122154, DOI: 10.1016/j.apenergy.2023.122154

<sup>9</sup> WTO, 10 January 2024, **High demand for energy-related critical minerals creates supply chain pressures**

<sup>10</sup> European Commission, 2021, **Study on the resilience of critical supply chains for energy security and clean energy transition during and after the COVID-19 crisis** (PDF)



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raw materials (e.g., use the same quantity of stainless steel) and the gas boiler plumbing system is comparable to hydronic heat pumps.<sup>11</sup>

Europe is a technology leader and has substantial production facilities, which places heat technology manufacturers in a good position to respond to global challenges by:

1. Implementing recycling practices and substitution of secondary raw materials<sup>12</sup> to reduce future exposure to exogenous shocks.
2. Investing in flexibility of production processes, which allow them to respond to materials shortage, for example adopting simpler designs (e.g. using the same fan for different functions in heat pumps).<sup>13</sup>

A new Circular Economy Act, which is expected in the next five years, needs to be successful in creating a European market for secondary materials and waste, especially critical raw materials. It is critical that the Act encourages the circularity potential of heating technologies and fosters the transition away from fossil-based systems.

### Recommended actions

- > **Put clean heat and energy efficiency at the core of any new definition of energy security** developed by the European Commission.
- > **Promote a stronger EU approach to material efficiency and circularity** for critical raw materials with the new Circular Economy Act.

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<sup>11</sup> JRC, 2023, **The Heat Pump Wave: Opportunities and Challenges**

<sup>12</sup> ECOS reports an example for Tesla using cobalt-free Lithium Iron Phosphate (LFP) batteries in almost 50% of new cars. ECOS, DUH and RREUSE, 2023, **How to reduce our dependency on critical raw materials by stimulating circularity** (PDF)

<sup>13</sup> JRC, 2023, **Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU – A foresight study**



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## CHAPTER 2

# ENHANCING MACROECONOMIC STABILITY

### Open up demand-side action to save energy costs and protect public budgets

Implementing the clean transition means de-risking the economy, by reducing exposure to exogenous shocks and increasing opportunities for domestic growth. Investing in buildings decarbonisation, through roll-out of renewable energy coupled with demand-side measures, has many untapped economic benefits in terms of economic value, longer term price stability and cost savings.

**Demand reduction, switching away from fossil heating and flexibility are pivotal to provide long-term stability to public budgets.** The sudden disruption of gas supply in late 2021 demonstrated the EU's vulnerability to global price volatility and value chain disruptions, with significant repercussions for public budgets. EU governments spent €651 billion between September 2021 and June 2023<sup>14</sup> to rescue citizens and businesses affected by the cost-of-living crisis. During this time, households with heat pumps and solar PV experienced the highest savings on their bills, and this trend is estimated to persist even if prices return to pre-crisis level.<sup>15</sup>

Adopting demand-side flexible (DSF) technologies such as smart controls, demand management, energy storage and distributed renewable generation also leads to direct savings on energy costs. Activating DSF technologies in 2030 could save up to €262–690 million across the EU27.<sup>16</sup> Space heating offers the highest level of savings: consumers could experience a potential cost reduction of more than €71 billion (64%) per year on electricity consumption. In addition, these technologies can deliver over €300 billion in indirect annual benefits (e.g., reduction in generation capacity costs, investments needed for grids, system balancing costs and carbon emissions to people, communities and businesses).<sup>17</sup>

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<sup>14</sup> Bruegel, June 2023, **National fiscal policy responses to the energy crisis**

<sup>15</sup> Solar Power Europe, 2023, **Clean Heat Report**

<sup>16</sup> SmartEN & DNV, September 2022, **Demand-side flexibility in the EU: Quantification of benefits in 2030**

<sup>17</sup> Ibid.



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## Efficient buildings lead to long-term disposable income for citizens

**Energy efficiency and decarbonisation in buildings can also generate indirect rebound effect and boost economic recovery in the long term.** Investing public resources in buildings and energy renovation has increased in recent years due to the spillover effect of construction activity on the economy and the positive impact on GDP. Extensive deployment of heat pumps (both in individual heating systems and in DH networks) and high renovation rate in the period 2022–2030 can increase disposable incomes of households by at least 2%, and lead to a 2.5% growth in annual GDP by 2030 compared to a business-as-usual scenario.<sup>18</sup>

Despite its initial investment cost, higher efficiency translates into lower energy demand and spending, particularly for worst-performing buildings. Improvements in energy efficiency for homes last between 12 and 42 years and increase disposable income, resulting in a persistent boost to consumer spending and accelerated economic recovery.<sup>19</sup> Any money not spent on energy can be redirected into local higher added-value goods and services that have a stronger domestic component, and therefore improve the balance of payments.<sup>20</sup>

Given the lasting and wide-ranging benefits, both to public finances and society as a whole, it is key for member states to invest in appropriate fiscal and market incentives that create the conditions for mass deployment of buildings efficiency and decarbonisation measures. Swiftly implementing the Energy Performance of Buildings Directive (EPBD) is critical to facilitate finance, improve access to information and enhance building standards across the EU.

## Deepen fiscal analysis of the transition

The transition of Europe's buildings stock and wider economy to low-carbon emissions is nothing short of transformational and calls for new standards for macroeconomic and fiscal assessment. For example, the UK's Office for Budget Responsibility (OBR) analysis concluded that the debt impact of future volatility in gas prices can amount to 13% of UK GDP, more than double the debt impact

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<sup>18</sup> EHPA - Cambridge Econometrics, April 2023, **Europe's leap to heat pumps: The socio-economic and climate benefits unlocked by a fast heat pump roll-out**

<sup>19</sup> EEIG report, 2020, **Energy efficiency's offer for a net zero compatible stimulus and recovery** (PDF)

<sup>20</sup> Ibid., p.17



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of investing in net zero by 2050.<sup>21</sup> Setting a gold standard for fiscal analysis, the OBR also investigated the potential of heat pumps, renewables and energy efficiency to protect future consumers, and captures both risks of “unmitigated climate change” and “late transition” into debt sustainability.

In-depth analysis of fiscal risk and opportunities will become even more crucial as the transition evolves, especially when it comes to complex topics like the built environment. This is why National Fiscal Councils in Europe should include sustainability as part of their independent assessments and provide governments with the necessary evidence to develop monitoring tools that support better transition planning. A dedicated study assessing the impact of energy transition on the European economy will be a great first step in that regard.

### Recommended actions

- > **Fast-track the implementation of the Energy Performance of Buildings Directive** and plan well-designed economic and fiscal incentives at member state level to speed up the deployment of efficiency measures and clean heat technologies.
- > **Launch a study assessing the impact of the energy transition on the European economy** in terms of fiscal risks and benefits.

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<sup>21</sup> E3G, 25 July 2023, [A new gold standard in the fiscal analysis of the energy transition](#)



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## CHAPTER 3

# USING AND SUPPORTING THE FINANCIAL SYSTEM

### Upgrade financial tools to provide certainty and visibility in the real estate market

**Improving and scaling up the financial mechanisms available for buildings decarbonisation can help protect both households and banks.** In 2022, 70% of the EU population lived in households that own their homes.<sup>22</sup> In the financial market, European residential buildings have a total worth of around €20 trillion, with approximately €7 trillion in mortgages, leaving €13 trillion in equity.<sup>23</sup> The value of real estate makes it crucial to protect this category of assets from physical and transition risks in the long term.<sup>24</sup>

Less efficient homes increase households' exposure to energy price shocks, with an impact on their debt–service ratio (DSR),<sup>25</sup> reducing the share of income for monthly mortgage payments, and affecting their property value. In past years, DSRs have risen dramatically, translating into higher default risk. Buildings, like other physical infrastructure, are particularly exposed to climate risks due to extreme weather events, which impact actors across the financial system. Insurers and banks have high risk exposure, due to higher insurance premiums and potential loss of market value of mortgages.

**Financial institutions, such as the European Central Bank (ECB), European Banking Authority (EBA) and European Investment Bank (EIB), are calling for the implementation of the EPBD to increase stability and certainty in the financial environment.** The real estate sector constitutes a significant portion of financial institutions' exposure, accounting for over €5,000 billion across the

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<sup>22</sup> Eurostat, 2023, **Housing in Europe – 2023 edition**

<sup>23</sup> Climate Strategy & Partners, May 2024, **Highlights from the conference 'Engaging Retail Lenders in Home Renovations'** (PDF)

<sup>24</sup> European Central Bank (ECB), 2022, **Good practices for climate-related and environmental risk management** (PDF)

<sup>25</sup> European Systemic Risk Board (ESRB), 2024, **Follow-up report on vulnerabilities in the residential real estate sectors of the EEA countries** (PDF)



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euro area banking system. Mortgage portfolios represent a significant share of EU banks' balance sheets, making them both key for risk management and responsible to channel funds for the transition. According to the ECB: *“Encouraging mortgage holders to enhance the energy performance of their buildings could be a strategic move for financial institutions, helping to reduce loss given default and decrease market risk associated with collateral.”*<sup>26</sup> ECB highlighted the multiple benefits of energy performance of buildings in terms of certainty for credit, portfolio allocations and medium-term financing. EBA also considers the EPBD extremely relevant to increase sustainable finance volume and in supporting risk management.

**Mobilising the necessary volumes of public and private capital to deliver an ambitious European renovation and decarbonisation journey will require the deployment of fit-for-purpose grants and financial tools.** An estimated €2 trillion in a decade or €6 trillion by 2050 of green financing are needed for housing renovation.<sup>27</sup> A combination of public, private and blended capital will be necessary to meet the needs of European citizens, depending on individual and national circumstances. The EPBD made a clear call for member states to ensure the appropriate financing is put in place, including through streamlined public finance procedures, effective use of EU and national financing, deployment of financial tools, and support for the adoption of lending products for renovations, like green mortgages and loans.<sup>28</sup> A European Commission guidance, expected in 2025, will provide further direction to support lenders to increase lending volumes for energy renovations, including on social safeguards around blended finance to protect low-income and vulnerable households, and those living in worst-performing buildings where investment needs may be substantial.

## Making it easier for private banks to invest in renovation and decarbonisation

Some EU and national institutional investors are already channelling support for the buildings transition in cooperation with retail lenders. For example, the EIB signed a first-of-a-kind agreement with Ireland in October 2023 to support

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<sup>26</sup> European Systemic Risk Board (ESRB), 2024, **Follow-up report on vulnerabilities in the residential real estate sectors of the EEA countries** (PDF)

<sup>27</sup> Climate Strategy & Partners, 2023, **Engaging retail lenders in home renovation** (PDF)

<sup>28</sup> European Union, 24 April 2024, **Directive (EU) 2024/1275 of the European Parliament and of the Council on the energy performance of buildings (recast)**





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government-backed low-interest loans for energy renovation.<sup>29</sup> Such projects help leverage more private resources, protect against the risk of default and increase project credibility, while making finance more affordable to citizens. Overcoming remaining challenges faced by private banks, including through the implementation of the EPBD, is a crucial next step to fast-track the deployment of more innovative solutions.

**Challenge:** Banks experience a lack of long-term visibility on return from sustainable investments and this has a negative impact on their willingness to participate in programmes for energy efficiency mortgages.

**Proposed solutions:**

1. **Mortgage Portfolio Standards (MPS):** As part of not sufficiently explored levers within the new EPBD framework, MPSs are a voluntary mechanism creating incentives for mortgage lenders to increase the median energy performance of the portfolio of buildings covered by their mortgages towards 2030-2050.<sup>30</sup>
2. **Preferential Loans for Renovation** have a huge potential to guide homeowners' investments towards safe, energy-efficient and cost-effective properties in the long run. One such instrument is the EU Renovation Loan, proposed by the Energy Efficiency Financial Institutions Group to access long-term financing (30 years) for deep renovation. Backed by public guarantees, such a tool can provide credit to financial institutions so they can offer favourable borrowing conditions in the real economy.<sup>31</sup>

**Challenge:** Banks and customers miss accurate information and data about buildings' history and features to be able to make well-informed investment choices.

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<sup>29</sup> European Investment Bank, 2023, **Ireland and EIB Group confirm support for new low-cost Home Energy Upgrade Loan Scheme**

<sup>30</sup> Climate Strategy & Partners, May 2024, **Highlights from the conference 'Engaging Retail Lenders in Home Renovations'** (PDF)

<sup>31</sup> Euractiv, 9 February 2023, **An EU renovation loan can unlock €2 trillion of future energy savings**



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#### Proposed solutions:

1. **Energy Performance Certificates (EPCs):** Introduced in 2002, EPCs provide essential information about energy performance rating and recommendations for cost-effective improvements. This provides a minimum required level of awareness for consumers to choose whether to buy or rent a property.<sup>32</sup>
2. **Building renovation passports:** Track and collect information about a property, including design of a long-term roadmap of future retrofits and installations needed for full decarbonisation.<sup>33</sup> This instrument would be helpful across the retrofit value chain and support a trustworthy environment for investments, through risk assessments and verification of credentials based on available information.

#### Recommended actions

- > **Encourage European financial institutions to mainstream blended finance schemes** supporting buildings decarbonisation (e.g., low-interest loans) and play the role of guarantor with national banks.
- > **Encourage private banks to establish risk-management and investment strategies** for their real estate portfolio that take into account energy performance data, including Energy Performance Certificates and Renovation Passports.

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<sup>32</sup> European Commission, **Certificates and inspections** (webpage, accessed September 2024)

<sup>33</sup> Green Finance Institute, June 2024, **Building Renovation Passports: Creating the pathway to zero carbon homes, A report by the Green Finance Institute's Coalition for the Energy Efficiency of Buildings**



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## CHAPTER 4

# TAPPING INTO INDUSTRIAL POTENTIAL & COMPETITIVENESS

**With their level of economic activity, buildings and efficient heating and cooling sectors are assets of the European economy and their industrial potential can contribute to EU's competitive advantage.** The construction sector (including buildings, civil engineering and specialised construction activities) provides 18 million direct jobs and contributes to about 9% of GDP<sup>34</sup> in the EU. Within that, the residential and non-residential buildings sector accounted for 5.7% of EU GDP in 2023.<sup>35</sup>

Decarbonisation of building stock is reshaping the labour market by:

- > **Boosting the number of jobs:** 760,000 – 1,480,000 estimated new jobs<sup>36</sup> in renovation and a 90% employment increase in SMEs.
- > **Offering more competitive salaries to low-skilled workers:** The energy efficiency sector offers more opportunities to low-skilled workers (48% vs 42% in the fuel and utility sectors) with above average earning-potential (29% vs 13%).<sup>37</sup>
- > **Requiring more digital and technical skillsets:** For instance, the heat pump sector offers versatile employment in components and manufacturing, installation, service and maintenance as well as R&D.

The need for member states to promote education and training within the buildings and renewable energy sectors is already recognised in the EPBD. At EU level, relevant skills and qualifications need to be part of the proposed “Union of Skills”<sup>38</sup>. This includes their incorporation in the Skills Portability Initiative and

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<sup>34</sup> European Commission, **Construction sector** (webpage, accessed July 2024)

<sup>35</sup> Eurostat, **Basic breakdowns of main GDP aggregates and employment (by industry and by assets)** (accessed July 2024)

<sup>36</sup> FEANTSA, March 2024, **Five Economic Reasons to Prioritise Low-Income Earners in the EU Renovation Wave**

<sup>37</sup> Ibid.

<sup>38</sup> European Commission, 3 October 2024, **Mission Letter Roxana Mînzatu**

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European Strategy for Vocational Education and Training, in order to provide sustainable long-term employment opportunities.

**Acknowledging heating and cooling as an industrial cluster within the Energy Efficiency Ecosystem<sup>39</sup> will help provide long-term visibility for the sector.**

When it comes to the supply of green products and technologies, heating and cooling appliances can enhance EU manufacturing. For example, the EU holds significant global market share in heat pumps manufacturing, along with leadership in engineering.<sup>40</sup> Since March 2024, heat pumps have been recognised as “strategic net zero technology” under the Net Zero Industry Act.<sup>41</sup> At the same time, the existing European Industrial Strategy does not consider energy efficiency, heating and cooling as standalone ecosystems or industrial clusters.<sup>42</sup> This means that strengths and bottlenecks in supply chains are not well understood and coordinated at EU level.<sup>43</sup> The new Industrial Deal can provide better long-term predictability, including through a revamp of the EU’s heating and cooling strategy and the publication of the long-awaited Heat Pump Action Plan.<sup>44</sup>

**Buildings efficiency, heating and cooling sectors have significant innovation potential that needs to be fostered to overcome global competition.** According to the European Climate Neutral Industry Competitiveness Scoreboard (CINDES), public R&D and patent creation in the EU is relatively high for key technologies like heat pumps, building envelope technologies, smart building energy management systems, and heating and cooling networks. However, there is a need to increase the levels of investment in EU-based start-ups and scale-ups both for clean technologies and emerging construction models (prefabricated buildings, superinsulation materials). In addition, the EU’s share of global exports is decreasing, which is reflected in a deteriorating trade balance. This calls for stronger EU action to support technologies across the whole value chain.

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<sup>39</sup> Defined as “the diverse network of EU sectors dedicated to developing, delivering, and promoting technologies and services aimed at reducing energy consumption and enhancing energy efficiency” by the Coalition for Energy Savings, in The Coalition for Energy Savings, September 2024, **Empowering the EU Energy Efficiency Industrial Ecosystem to Deliver on Net-Zero**

<sup>40</sup> E3G, CISL and the ZOE Institute, May 2024, **Building a New European Competitiveness Deal - Six tests for a prosperous, resilient, fair and green economy**

<sup>41</sup> EHPA, June 2023, **Heat Pumps in the Net Zero Industry Act** (PDF)

<sup>42</sup> The creation of a Clean Transition Dialogue for Energy Efficiency and define energy efficiency as one of the industrial ecosystems are two asks by the Coalition for Energy Savings, in **Empowering the EU Energy Efficiency Industrial Ecosystem to Deliver on Net-Zero**

<sup>43</sup> European Cluster Collaboration Platform, **Definition of industrial ecosystems**, (webpage, accessed July 2024)

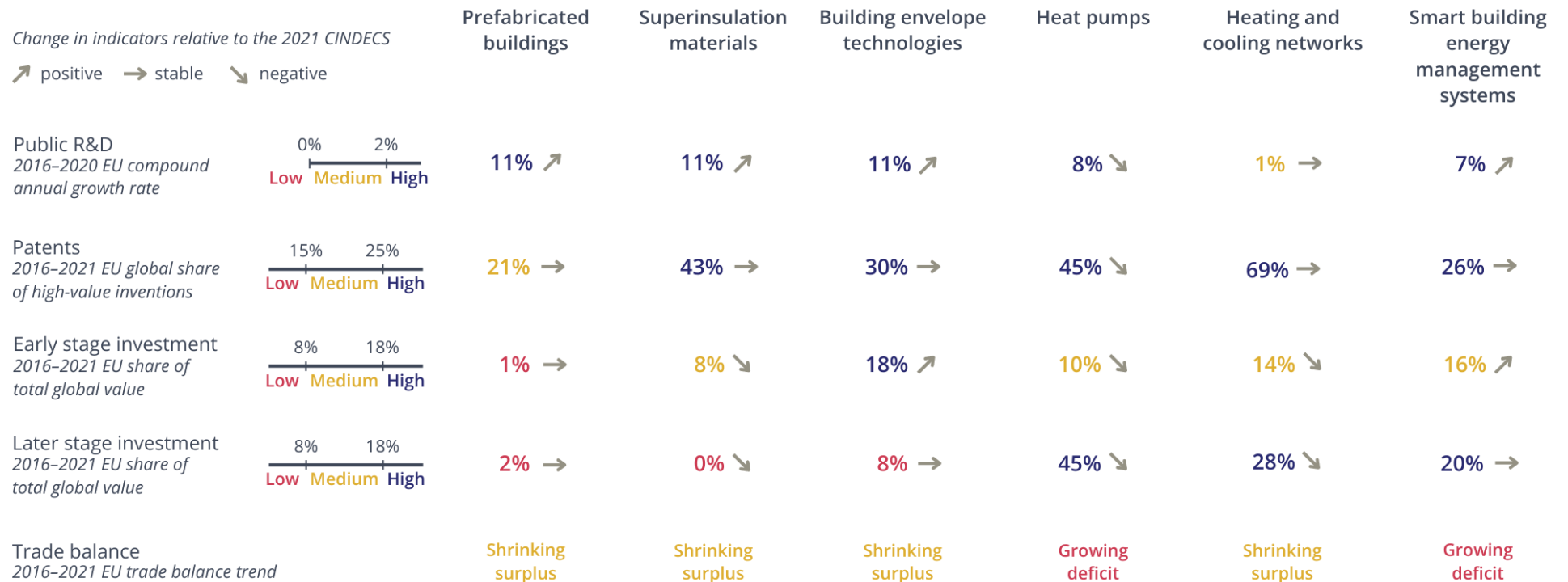
<sup>44</sup> European Commission, **Heat Pump Action Plan** (webpage, accessed July 2024)

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## Competitiveness of building efficiency, heating and cooling technologies in the EU



Source: European Commission: Joint Research Centre, 2023, European climate neutral industry competitiveness scoreboard (CINDECS) 2022

Figure 3: Competitiveness of building efficiency, heating and cooling technologies in the EU.



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**Scaling up innovative business models can speed deployment of clean heat and help overcome obstacles related to costs.** Across the EU there is an uptick of new business models that help customers adapt to new technologies, for example, new “energy-as-a-service” contracts, monthly financing, leasing schemes and subscriptions models at guarantee costs.<sup>45</sup> The European Innovation Council,<sup>46</sup> as the main institutional body supporting “game-changing innovations”, should accelerate and consolidate the use of these models by expanding the scope of its current action.

### Recommended actions

- > **Boost the role of heating and cooling as industrial cluster within the energy efficiency ecosystem.** Create a comprehensive legislative framework with the review of the Heating and Cooling Strategy, complemented by the publication of the Heat Pumps Action Plan.
- > **Expand the scope of the European Innovation Council** to consolidate innovative business models making clean heat technologies accessible to consumers.

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<sup>45</sup> Climate Xchange, August 2024, **Range of business models used in Scotland**,

<sup>46</sup> **European Innovation Council**, (webpage, accessed October 2024)



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## CHAPTER 5

# REALISING HEALTH AND SOCIAL BENEFITS

**The cost-of-living crisis has worsened levels of energy poverty and deepened social inequality in Europe.** In 2022, 6.9% of the EU population faced arrears on their utility bills and 14.8% lived in dwellings with a leaking roof, damp walls or rotten frames. In 2023, 10.6% were unable to keep their house adequately warm.<sup>47</sup> This data unveils a harsh reality to which many Europeans are subjected and that, coupled with the housing crisis, is increasing the social and economic burden on households.

The housing crisis in Europe has worsened in the past few years, with spiralling prices and increasing speculation on the market, making housing affordability a common issue across member states. The tangible negative impact of the crisis is shifting focus on ensuring access to quality housing as an essential public service. As highlighted by Letta, a successful Single Market offers the freedom of mobility and ensures the right to stay.

**The demands for action to address the housing crisis should not come at the expense of mitigating the many health-related consequences of delayed efficiency improvements and H&C decarbonisation. The risks from poor living conditions to wellbeing and health are often underestimated.** Inadequate ventilation, poor air quality, extreme temperature, noise pollution and poor lighting are just some of the building conditions that have negative health consequences.<sup>48</sup> In 2018, health-related social costs of air pollution due to domestic heating and cooking with indoor fossil fuel combustion amounted to €29 billion for the EU27 and the UK.<sup>49</sup>

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<sup>47</sup> European Commission, **Energy poverty** (webpage accessed September 2024)

<sup>48</sup> FEANTSA, March 2024, **Five Economic Reasons to Prioritise Low-Income Earners in the EU Renovation Wave**

<sup>49</sup> CE Delft, May 2022, **Health-related social costs of air pollution due to residential heating and cooking in the EU27 and UK**

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In contrast, implementing the EPBD is estimated to generate health cost savings of more than €900 million per year in the period 2020–2030.<sup>50</sup> Renovating 10% of the worst-performing buildings is an investment that can have a substantial long-term benefit on health and a very short payback period (estimated 1.5 years).<sup>51</sup> In addition, heat pumps and electric induction are three times more efficient respectively for heating and cooking.<sup>52</sup> They constitute the cleaner, healthier and safer alternative for EU citizens.

To achieve the aim of “affordable and sustainable” housing, energy poverty must be addressed. The benefits of efficient buildings to lower energy costs and improve quality of life are evident. However, the high upfront cost of retrofits and building upgrades can be prohibitive for some householders. Targeted government supports are not only necessary in overcoming these burdens, but also to ensure wide societal support for the transition.

Public subsidies and grants schemes are one tool that can support householders in pursuing home upgrades. However, for these subsidies to be effective, they need to be well targeted and ensure that the distribution of support also addresses wider social inequalities. The inefficient allocation and uneven redistribution of public money risks excluding lower- and some middle-income citizens from accessing affordable, healthy and energy-efficient housing.

Existing government grant schemes which support householders in efficiency upgrades vary across the EU27. There is significant room to both exchange best practice and learn from past implementation mistakes. EU institutions are well placed to identify overarching standards and criteria to guide and support member states in implementing effective, and socially considered, direct support schemes. This effort will be an important component of the incoming Housing Commissioner’s work to support member states in achieving sustainable and affordable housing in Europe.

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<sup>50</sup> FEANTSA, March 2024, **Five Economic Reasons to Prioritise Low-Income Earners in the EU Renovation Wave**

<sup>51</sup> Ibid.

<sup>52</sup> ECOS, June 2024, **End of gas cookers ‘in sight’ as electric hob prices fall – NGO report**





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### Recommended actions

- > **Enshrine healthy, affordable and energy-efficient homes as a fundamental social right.**
- > **Provide a European template identifying common overarching criteria** for designing grants and funding schemes and use National Building Renovation Plans across member states.