EU micro-construction companies: rising to the 2040 climate objectives

What Europe's Renovation wave means for micro construction businesses - how to take-up the challenges and thrive

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Executive Summary

Meeting the EU's 2040 climate objectives means tripling renovation rates, from around 1% today to at least 3%, with a first milestone of 16% of primary energy savings between 2020 and 2030, and the growing priority to deliver affordable housing. With nearly three quarters of homes energy-inefficient and nearly 10% of energy-poor households, this represents both a challenge and a major opportunity to create local economic value while improving many people's living conditions. Micro-companies - 94% of firms and nearly half of the sector's jobs - will be central. Their future will depend on how regulation, finance, industrialisation, and above all collaboration reshape the renovation market and the value chain.

From a fragmented, underperforming market to a renovation wave

The residential renovation market is fragmented and uneven across Europe. Micro-companies represent 94% of firms and nearly half of the workforce but capture only 31% of value and remain heavily dependent on larger players' strategies. Most Member States lack comprehensive frameworks to reach 3% renovation rates, and projects are often slowed among others by unstable support framework, uncertain financing, and complex local permitting.

At the same time, the European regulatory framework is tightening. The European Green Deal and Fit for 55 package set the overall climate trajectory. The Renovation Wave strategy aims to double renovation rates by 2030, while the Energy Performance of Buildings Directive (EPBD), recast in 2024, introduces national building renovation plans and one-stop shops to guide households and companies. The Construction Products Regulation (CPR) and the EU Taxonomy push for more transparency, life-cycle performance, and access to green finance.

These measures have not yet transformed local markets, but they set the direction: more and simpler renovations, deeper energy savings, increased access to financing. The policy mix now being deployed across Europe lays the groundwork for the renovation wave that this study takes as its conceptual framework: a future where renovation activity is scaled up, better structured, and where micro-companies play a crucial role.

Four market drivers to get there

By 2030, four forces are expected to progressively transform the residential renovation market:

- Deep renovations becoming unavoidable, together with industrialisation strategies: Every home must reach a high energy standard sooner or later. This can happen in two ways: (1) *Staged deep renovations*: works are spread over time, which spreads costs and is more manageable for households. This approach fits well with micro-companies' capabilities (2) *One-shot deep renovations*: all works are done at once. This is only realistic if finance and project management are in place. Integrated operators, linking works with financing, are positioning on this market. Both models will and should coexist, with however a likely glass ceiling for one-shot deep renovations, given its high cost, even with a higher access to financing. For both approaches, industrialisation is part of the answer. Yet, what is or should be industrialised would benefit from being better scoped, and leverage micro construction companies' key strengths: flexibility, local anchorage, trust, know-how.
- One-stop shops (OSS) multiplying: OSS simplify procedures and channel subsidies. They are likely to become gateways to the market. For micro-firms, partnering with OSS can mean visibility, stable demand, and structured feedback. But without that link, they risk being left aside. The upcoming roll-out of OSS by Member States should integrate guidelines so that micro construction companies have a fair access to OSSs' networks and leads.

- **Clean heating, ventilation and cooling**: Millions of heat pumps, district heating upgrades, and better ventilation systems will be needed. This will generate large volumes of installation, commissioning, and maintenance work. Passive cooling and simple comfort measures (airtightness, shading) will also drive demand accessible to small firms. Micro companies should look at this market, as these solutions require less skills and less financing, while brining high environmental value.
- **Sustainable materials and circular practices**: EU rules (CSRD, Taxonomy, revised CPR, EPBD) push for more traceability, disclosure, and waste management. Micro-companies will increasingly face requests for environmental data from clients or financiers. This may add administrative weight but also open opportunities for those who specialise in eco-materials or reuse.

A key follow-up from this study would be to better understand and segment homeowners' demand, in strong correlation to their socioeconomic profiles, access to financing and ownership structures, to adequately structure financing (including private one) and facilitate micro construction companies' positioning on markets that best fit their capabilities.

More work, different skills

Energy performance upgrades and HVAC are expected to be the strongest job creators. Net job growth is forecast for the sector overall. Yet shortages are already severe, and micro-companies struggle more than larger firms to recruit and retain, especially for younger workers, and with posting questioning the real interest in investing in training. General participation to training has been falling in average across EU. Redesigning training systems, with a stronger adequation between short term market needs and training, appears as an opportunity to further explore.

All trades will evolve. Envelope and insulation work will need new techniques and materials. Many side-trades will have to collaborate earlier in project design. Digital, social and coordination skills will be as important as technical know-how. New jobs, such as renovation coaches or reuse coordinators, may emerge. For micro-companies, this means investing in training and adapting to tighter quality standards.

Collaboration at the core

The way micro-companies work is also changing. Industrialisation and standardisation are entering the renovation market through prefabricated kits, lean processes, and aggregated projects. These can cut costs and delays, but they favour larger operators able to manage integrated projects at scale. If micro-companies remain isolated, they risk losing direct access to households and being confined to subcontracting roles.

Collaboration is therefore becoming essential. By joining structured ecosystems, forming cooperatives or temporary grouping, or partnering with OSS, micro-firms can pool their strengths, access larger projects, and benefit from shared back-office or compliance support. Working in networks also helps them learn from structured feedback and adapt faster to new rules.

Trusted, flexible, local: the value of micro-construction companies

Despite the challenges ahead, micro-companies have clear strengths that must be mobilised in the renovation wave. Their **proximity to households** and ability to build trust at local level are assets in a market where decisions are often made home by home. Their **flexibility and reactivity** allow them to adapt quickly to unexpected site conditions and tailor solutions to individual needs. They also play a key role in maintaining **local employment and craft know-how**, which is critical for the **social acceptance** of renovation policies. If these strengths are recognised and supported through training, simplified tools, and fair access to renovation ecosystems and markets, micro-construction companies will power Europe's renovation wave.

1 Introduction

Achieving our climate targets also means rethinking the way we build, renovate, and support the actors engaging with our built environment. Homes and buildings are already being put to the test by demographic change, urbanisation, and changes in household structures. At the same time, the construction and renovation sectors face long-standing and emerging challenges.

Energy renovation, a cornerstone of the energy transition, holds the key to more decent and energy-efficient housing. However, it raises questions about how small construction businesses – SMEs, microenterprises, and craftspeople – can stay competitive and thrive in rapidly evolving markets.

To meet the EU's climate goals for 2040 and beyond[1], energy renovation activity must significantly scale up – tripling current rates. Yet, projects are often delayed or blocked due to funding shortages, shifting policy environments, complex regulations, a shortage of skilled workers, and fragmented local markets and institutions.

As regulations evolve, they must be accompanied by practical support measures. This includes boosting demand for renovation while helping SMEs optimise their work processes and manage costs. Whether at building level (e.g. lean renovation methods), neighbourhood level (e.g. grouped renovations), or regional level (e.g. local materials and circular logistics), micro and craft businesses have specific strengths that should be recognised and supported by policymakers.

For example, the Energy Performance of Buildings Directive (EPBD), recast in 2024 (Directive (EU) 2024/1275) is expected to strongly influence demand in the coming years. Its implementation will bring new incentives and obligations, such as national renovation pathways and minimum energy performance standards for non-residential buildings. For SMEs to seize these opportunities, accessible financing solutions and widespread deployment of one-stop-shops for renovation support are crucial.

The construction sector is already adapting – with new digital tools, evolving business models, and efforts to attract a more diverse workforce. However, SMEs face distinct challenges. They must navigate growing complexity, increasing paperwork, and a need for new skills in areas like energy efficiency, circular economy, and digitalisation.

Micro and small businesses must not be sidelined by the push for industrialisation. Instead, policies should aim for balanced collaboration, ensuring that SMEs have fair access to the energy renovation market and can partner with larger players on equal footing.

Better accompanying small construction companies in delivering energy renovation is a unique opportunity to create local jobs. Indeed, both EU and national-level studies forecast the construction sector to be the sector with the most net job creation due to the low-carbon transition (Climact, Oxford Economics and Belgian Federal Planning Bureau, 2016; Eurofound, 2019; Cambridge econometrics, 2021). And, this is not achievable without the sustained involvement of micro companies and crafts, who account for 94% of businesses and 46% of jobs in the sector across Europe.

[1] 90% emissions reduction by 2040 (relative to 1990) and net-zero by 2050, followed by net negative emissions after 2050.

2 Objectives and methodology

2.1 Objectives of the study

The objective of this study is to **synthesize existing knowledge and expert insights on how EU energy-efficiency and decarbonization targets affect micro-enterprises, small construction businesses, and craft trades.** By mapping key trends, structural barriers, and opportunities for adaptation, the study aims to raise awareness among both policymakers and sector stakeholders and ensure that the specific needs and realities of these businesses are fully considered in future EU strategies. Rather than providing exhaustive quantitative assessments at national or EU level, the work focuses on highlighting the main impacts of evolving climate and construction policies and informing dialogue to ensure that SMEs and craftsmen—who are essential to delivering the EU's climate ambitions—are supported to lead this transformation rather than being left behind. **Formulating policy recommendations was not part of the scope**, the priority being opening the discussions around possible futures for micro construction companies

Purposedly, this study starts from **a bold assumption**: **that the Renovation Wave becomes a reality, with renovation rates reaching 3% per year across Europe and energy savings delivering on climate targets**. It deliberately does not take today's situation as its baseline, since current renovation rates remain low, policies lack the required ambition, and markets are still missing major opportunities. While many studies already focus on the current challenges that construction companies face, this one takes a complementary approach. It places those challenges in context, showing not only the obstacles of today, but also what must change to align with climate ambitions. By exposing these gaps, the study fuels policy debate and strengthens EBC's role as a leading voice for energy renovation, with micro-construction companies powering Europe's climate transition.

2.2 Scope

This study focuses on

- **Micro-companies** – The analysis centered on micro-enterprises as defined by Article 3 of Directive 2013/34/EU (fewer than 10 employees and an annual turnover or balance sheet total not exceeding EUR 2 million). This group represents a substantial proportion of the construction ecosystem but faces structural challenges in adapting to energy-efficiency requirements.
- **The residential renovation market** – The study concentrated on the residential segment, which constitutes the primary market for micro-enterprises and a key driver for achieving EU energy-efficiency targets in buildings.

2.3 Methodological approach

The research was conducted in three main stages:

- **Literature review** – A broad review of academic studies, policy reports, and sectoral analyses was undertaken to map existing evidence on energy renovation trends, regulatory frameworks, and their implications for micro-enterprises. This included identifying knowledge gaps and areas requiring further qualitative insights.
- **Stakeholder engagement** – Preliminary findings were tested and enriched through a workshop with European-level trade federations, followed by interviews with representatives of national sectoral federations. This dual engagement allowed both cross-country perspectives and sector-specific nuances to be captured.

- **Qualitative analysis** – Literature and stakeholders' feedback were assessed qualitatively by CLIMACT. Internal expertise was also mobilised when literature was failing to provide concrete answers.

2.4 Limitations

The main limitation of this study lies in the availability and consistency of data. Economic activity related specifically to energy renovation is often aggregated with broader renovation data, making it difficult to isolate precise market figures. Furthermore, labour-market data—particularly on workforce shortages—remains fragmented and unevenly reported across countries, which constrains the robustness of cross-country comparisons.

3 European context and regulatory framework

At the European level, the policy framework for energy efficiency and decarbonization in the building sector is structured around several flagship strategies and legislative instruments:

- **The European Green Deal (2019–2020)** sets the overarching ambition for the EU to achieve climate neutrality by 2050, with an intermediate target of reducing greenhouse gas emissions by **55% by 2030 compared to 1990 levels**.
- These measures are part of the broader **Fit for 55 legislative package** (2021), which aligns EU energy and climate laws with the Green Deal's objectives and impacts the building and renovation sectors through a combination of incentives and compliance requirements.
- The **Renovation Wave Strategy** (October 2020) aims to **double the annual energy renovation rate by 2030** and renovate **35 million buildings** across the EU. It places particular emphasis on deep renovations, job creation in green construction, and tackling energy poverty.
- The **Energy Performance of Buildings Directive (EPBD), recast in 2024 (Directive (EU) 2024/1275)**, is the cornerstone of EU building policy. Key objectives include:
    - **Full decarbonization of the building stock by 2050**;
    - **Zero-emission buildings**: from 2028 for new public buildings and 2030 for all new buildings;
    - Introduction of **Minimum Energy Performance Standards (MEPS)** for the worst-performing buildings;
    - Deployment of **building renovation passports** and **one-stop shops** to support owners and small actors through the renovation process.
- The **Construction Products Regulation (CPR, Regulation (EU) 2024/3110),** adopted in December 2024, updates the rules for construction products: it mandates product-level environmental performance (lifecycle assessment, CO_2 emissions, etc.), introduces digital product passports and revised harmonized technical specifications, strengthens transparency, and enhances market surveillance.
- The **Energy Efficiency Directive (EED), recast in 2023 (Directive (EU) 2023/1791)**, introduces the "energy efficiency first" principle and sets a legally binding target for a **11.7% reduction in energy consumption by 2030**. It also strengthens obligations for the renovation of public buildings and places greater focus on alleviating energy poverty.
- Complementary legislation such as the **Renewable Energy Directive (RED II, 2018/2001)** supports the integration of renewable energy solutions into buildings, further reinforcing the decarbonization trajectory of the sector.

Collectively, these instruments define the EU's roadmap for transforming the building sector, with direct implications for both residential and non-residential renovation markets. They set binding targets, reshape regulatory and financing frameworks, and aim at fostering technological innovation and workforce upskilling across the value chain.

4 Existing and projected trends for the residential renovation market

4.1 A fragmented market that lacks attractivity

The following sections detail the short-term projected evolutions for the residential renovation market[2], which is both expected to drive growth over the coming years and to represent significant business opportunities for micro construction companies.

4.1.1 Micro companies dominate in numbers, large players hold the market power

The construction sector (NACE 41, 42, 43) is a highly deconcentrated market, fragmented into a large number of companies, 94% of which are micro companies (Eurofound, 2024), and with a share over 90% in most countries. Germany is an exception, with only 83% of micro companies. However, although they are at its core, literature suggests that larger companies subcontract activities to smaller ones, which then contract to even smaller ones (ELA, 2023). These many subcontracting chains are often long, which impacts the efficiency and the Occupational Safety and Health (OSH EURES European Labour Authority, 2023). **Although they account for the vast majority of companies**, this results in (amongst else) **micro enterprises only capturing 31% of the sector's added value, accounting for 46% of the sector's employment** (GROW, JRC, 2023) **and remaining highly dependent on larger firm's strategies.**

In other words, larger construction companies (250+ workers) play an influential role in the development and transformation of micro companies' activities, as they may directly subcontract them**.** They not only generate business opportunities but also set standards, impose operational requirements, and often lead the coordination of complex projects. They fasten the change for micro companies by influencing subcontracting requests. Nevertheless, the relationship between micro and larger enterprises is collaboration-based as well as competitive.

To fully grasp the implications of the 2040 objectives for micro companies, it is essential to anticipate how these larger firms will respond to evolving market dynamics—especially those changes that directly or indirectly affect them, such as the implementation of the Corporate Sustainability Reporting Directive (CSRD) (in terms of reporting) and the EU Taxonomy for sustainable activities (in terms of access to financing). Their strategic choices and adaptation will significantly shape the environment in which micro companies operate.

The CSRD and Taxonomy already impact what large companies request from small ones, which create the following identified risks for micro-enterprises

- **Trickle-down obligations:** large companies transferring reporting requirements onto small suppliers and subcontractors, even though they are not legally bound.
- **Fragmented reporting formats:** the proliferation of different templates and requests, creating disproportionate administrative burdens for very small firms.
- **Financing bias:** financial institutions favouring larger projects that can more easily demonstrate Taxonomy alignment and meet reporting demands, leaving smaller actors at a disadvantage.

[2] Given the absence of data for the energy renovation market, renovation should be understood as all renovation works, energy and non-energy.

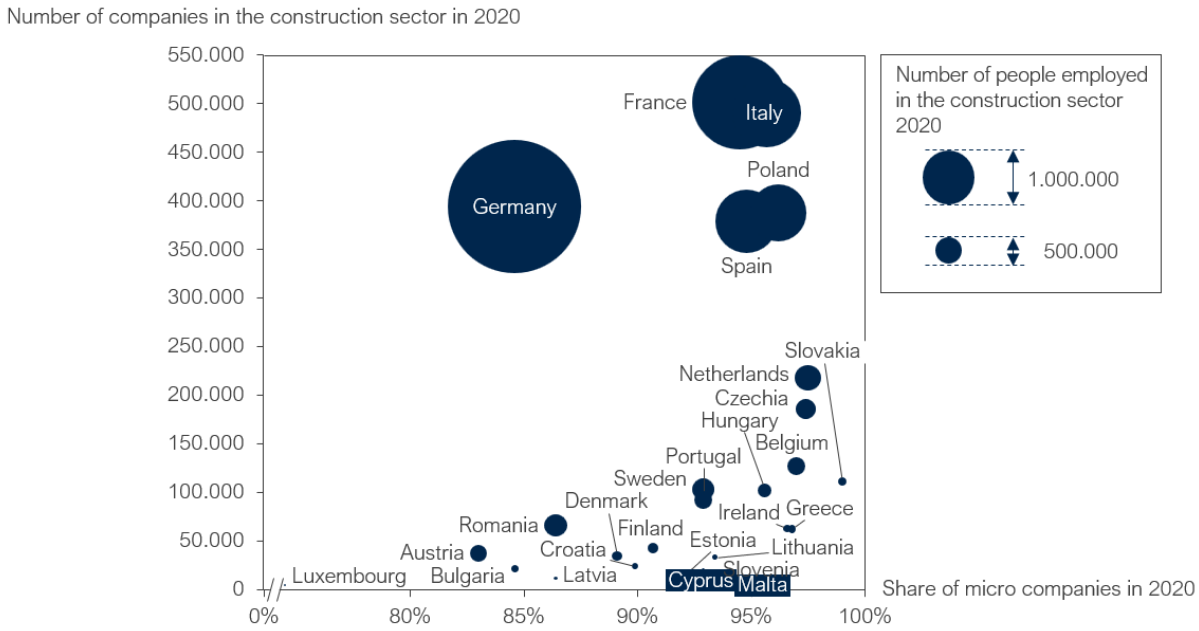

Figure 1 – Number of construction companies per country, with employment volumes and share of micro companies, in 2020 (from Euroconstruct 2024 data)

It is also noteworthy that micro-enterprises, which represent a significant share of renovation actors, are more sensitive than larger firms to macroeconomic fluctuations, particularly in contexts of inflation.

4.1.2 Short-term outlook for renovation varies across EU and call for specific policies

Market disparities in the European construction sector

Construction activity in the European Union is highly concentrated, with five countries accounting for 60% of total output. Germany leads with 28% of total production, while Slovakia contributes only 0.6%, highlighting significant disparities across Member States (standard deviation of 8%). Over the past five years, overall EU construction output has declined, affected by the war in Ukraine, the energy crisis, and the lingering impact of the COVID-19 pandemic.

The residential sector represents nearly half of the EU construction market on average, though shares vary widely between countries—from 27% in Hungary to 58% in Germany (standard deviation of 10%). The largest markets, including Germany, France, Italy, and Spain, are primarily driven by residential construction, whereas countries like Sweden, Poland, and Hungary report much lower shares around 30%.

Renovation is a key driver of residential construction in many European countries

At present, almost 75% of the European building stock is energy inefficient, with an annual average energy renovation rate stagnating at 1% (European Commission, 2023) when it should reach at least 3%. Therefore, the energy renovation market carries a significant untapped business potential. Data analysis show that renovation is a key driver of residential construction in many European countries, especially where new building is stagnating. It acts as both a **stabilizer** in weak markets and a **growth booster** in dynamic ones, highlighting its strategic importance for the sector's resilience.

More specifically, in 2020, 46.2% of the EU population lived in flats, more than one third (35.8%) lived in detached houses and close to one fifth (17.0%) lived in semi-detached or terraced houses (Eurostat, 2020). These two last markets are the ones representing the markets with the highest potential for micro companies, as households' investment decisions are much simpler and faster for these types of housing. The renovation of condominiums is a significant market, but require even more policy evolutions to be untapped : specific financing, decision-making support, alignment on energy certification methodologies.

The Figure 2 below provides a view on how renovation activity influences the overall residential construction market across several European countries.

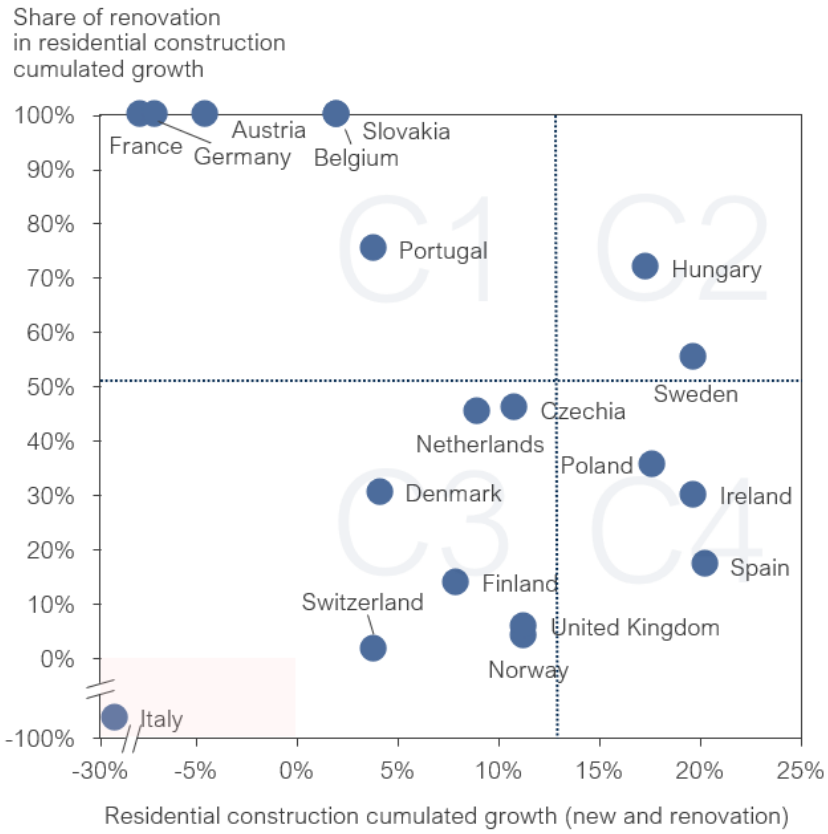

Figure 2 - Projected construction growth and relative contribution of renovation (2024-2027), from Euroconstruct (2024)

By plotting the cumulative growth in residential construction (horizontal axis) against the share of that growth attributed to renovation (vertical axis), the chart helps to distinguish between countries where the construction sector is pulled by renovation (C1 and C2 clusters) and those where renovation plays a more marginal role (C3 and C4 clusters). As mentionned in the methodology, **it is important to note, however, that renovation should be here understood as including both energy and non-energy renovation**, as there is no specific data on energy renovation. We however assume a similar rate of 1% of the residential building stock being renovated each year, in every EU country. To reach the European energy and climate goals, 3 to 4% of the EU residential building stock should be deeply renovated each year, meaning almost 23,000 daily until 2050 (BPIE, 2022) (Flanagan & Deacon, 2018).

Analysis shows that analysed EU countries[3] can be grouped in four clusters :

[3] The graph only displays EU countries who are member of Euroconstruct. Due to a lack of data, it is assumed that countries that are not covered by Euroconstruct would fall in one the proposed clusters.

- C1 – Renovation-led resilience: Countries like France, Germany, Austria, Slovakia, Belgium and Portugal show low or negative construction growth, but renovation—often accounting for over 90% of the total created value —sustains the sector, acting as the main force preventing deeper contraction.
- C2 – Balanced growth: In Hungary and Sweden, both new construction and renovation are strong, with renovation playing a major role in driving overall sector expansion.
- C3 – Underutilized renovation potential: Denmark, Finland, Switzerland, and Norway show modest overall growth, mostly from new builds, with renovation still playing a minor role—suggesting room for policy-driven stimulation.
- C4 – New build-driven growth: Countries such as Ireland, Spain, Poland, Czech Republic, and the UK are experiencing robust growth primarily from new construction, with renovation contributing less than 50%, revealing untapped potential for a more balanced approach.

Italy stands apart in the bottom-left corner (N2), showing both negative residential construction growth and an extremely low share of renovation. This can be explained by the end of the Superbonus program, which led to very high levels of activity in the past years.

Findings highlight three overarching insights relevant to ongoing policy debates

(1) Markets in C1 et C2 countries – mostly the Easterns and the nordics - may be more structured around (energy) renovation and already (or will) undergoing more transformation than markets in C3 and C4 countries, although it does not yet compensate the fall of new build. Analysing specific policy measures, market developments and value-chain evolution in C1 and C2 countries may be insightful to support the development of renovation in C3 and C4. International collaborations between national construction federations, for example through European funded projects, should be supported and strengthened to facilitate the replication of successful models. This is particularly relevant as nordic and eastern countries tend to have higher success rate for EU funded calls[4]. Micro companies tend to be much less involved in innovation processes, thus missing the opportunity that solutions are tailored to their specific needs.

(2) For markets in C4 countries, the shift from new build to energy renovation may be complex, with stronger cultural resistance backed by a positive economic outlook on new build. Specific incentives and support to privilege energy renovation over new build or unnecessary construction-reconstruction will be necessary. Incentives and support should target the whole supply chain: real estate developers, construction companies and material producers / wholesalers.

(3) Markets in C3 countries may experience the most difficult transformation, with both a higher gap in terms of energy renovation projects to deliver and a lower investment capacity of construction companies, impacting their training implementation and digitalisation.

Despite signs of dynamism, the residential energy renovation market will continue to underperform in profitability and attractiveness unless reinforced by consistent, stronger and long-term policy measures

If the profitability of new build businesses has been extensively researched, the one of renovation company remains understudied. Nevertheless, research conducted on 15 years of data of Finnish companies concludes that micro and small companies in the new building sector have a statistically significant

[4] That is the case for HORIZON calls, for which the EU commission publishes official data, that his however less tailored to SMEs and micro construction companies – who are mainly not doing research but can be useful field testers - than for example LIFE calls.

advantage in EBITDA[5] over renovation in same size groups; projects in the renovation sector appear to be more complex, especially in terms of design, causing cost overruns (Rajala, Ylä-Kujala, Sinkkonen, & Kärri, 2022).

Beyond the design of projects, although ongoing changes to the regulatory framework should positively impact the macroeconomic and regulatory environment *(see the next section)*, they do not impose any obligations on local public bodies, such as cities and inter-municipal organisations. This is a significant shortcoming. Indeed, despite the lack of official statistics, local stakeholders still frequently witness projects being abandoned due to the complexity of obtaining the necessary permits. Currently, only a few cities and municipalities effectively integrate renovation requirements into territorial development policies, such as developing one-stop shops managed by municipalities and supporting neighbourhood renovation projects as part of urban renewal projects. It is therefore essential to establish a framework for dialogue and collaboration with cities, enabling everyone involved in renovation projects to work towards a shared goal.

Finally, the instability of public support frameworks further undermines the market's attractiveness. Energy renovation — and access to its financing — remains too costly for most households, meaning that market momentum is closely tied to the level of public financial aid, whether direct (subsidies, loans) or indirect (warranty funds, tax policy). While some countries, such as Italy with its Superbonus scheme, have in recent years mobilized significant funding volumes, current market signals increasingly point to a trend of reduced public support. Although the forms of public intervention can be reconsidered (see section 4.2.2), any reduction in support budgets is fundamentally inconsistent with the long-term renovation targets set by Member States for their building stock

4.2 Member States must implement comprehensive policy mixes to improve the residential market conditions

As existing measures are proven largely insufficient to trigger large volumes of (deep) energy renovation**, specific and comprehensive policy frameworks dedicated to fostering (deep) energy renovations are required to deliver energy renovation at scale.** On that matter, the European Construction Sector Observatory underlines that *"Developing and implementing a policy intervention in the construction sector is a highly complex exercise, that needs to be thought in a holistic manner – not only from a sectoral, but rather from a systemic perspective (i.e. including horizontal policies)"* (ECSO, 2021). Policy frameworks shall consequently embed measures that activate and articulate all required levers: binding regulation, financing, collaboration framework between local and regional levels with dedicated tools and supports, training program targeting all education levels, communication plans, etc.

However, at present, we observe that almost all European countries lack such framework, although some countries have begun adapting their support schemes to facilitate the uptake of (one-step) deep renovations. The EPB[6] directive establishes a comprehensive set of obligations for Member States aimed at scaling up energy renovations. Consequently, EU countries shall significantly strengthen their policy mixes, with a more comprehensive approach. Such changes are mandatory and shall aim at improving the market conditions for the whole renovation value chain, firstly by stimulating the demand, but will – if implemented – significantly direct most of households' energy efficiency investments toward specific types of projects and structures.

[5] Earnings before interest, taxes, depreciation, and amortization

[6] Energy Performance of Buildings Directive

The sections 4.2.1, 4.2.2 and 4.2.3 develop the key policy changes that may be expected and impact the market conditions. The section 4.1.2 propose a grouping of EU countries on the basis of the short-term business outlook for their residential renovation market's to feed the policy debate at a EU level.

4.2.1 Minimum energy performance standards for the residential market

The implementation of National Building Renovation Plans (NBRPs) from 2027 onwards is expected to establish an initial set of revised objectives and measures to meet energy reduction targets, including the milestone of a 16% reduction in primary energy consumption by 2030.

To create a regulatory framework that supports these objectives, Member States may adopt **binding regulations** to stimulate renovation activity, as illustrated by Belgium (Flanders, Brussels-Capital) and France. Such obligations provide **a clear market signal,** enhance predictability in demand, and thereby foster investment. However, the design and scope of these obligations may vary significantly between Member States, depending on structural market factors such as ownership rates or tenant turnover.

These obligations may be paired with targeted measures to trigger renovations during key life-cycle events of buildings and the built environment. It is worth noting that these measures should be implemented, no matter if minimum energy performance standards are defined for the residential sector. These measures notably encompass renovation obligations, such as those already implemented in France and Belgium. When combined with **accessible and comprehensive financing solutions**, renovation obligations have proven to be a powerful instrument for stimulating energy upgrades at decisive moments, such as property sales or changes in tenancy, while contributing to a more stable and predictable renovation market. Beyond sales and rentals, other key life moments may include urban district regeneration, family changes (e.g., departure of children leading to subdivision or adaptation of dwellings), extensions, adaptations for ageing occupants, or structural and health-related works. In all cases, these measures should be supported by mechanisms to inform, attract, and accompany households through the renovation process, such as one-stop shops, district-level renovation coaches, streamlined urban permitting, or preferential financing conditions.

4.2.2 A restructuring and redirection of the public financing support towards deep energy renovation projects

On one hand, across all countries, access to financing—both public subsidies and private capital—remains a decisive factor in the realisation of deep energy renovations. High upfront investment costs continue to be a major barrier. On the other hand, financial support mechanisms generally remain agnostic to the level of energy savings achieved. The growing pressure on public budgets is likely to prompt **a progressive reorientation of public support measures toward deep energy renovation projects,** which maximise leverage not only in economic terms, but also with respect to energy savings, social outcomes, and environmental benefits. Evidence suggests that such targeted approaches are particularly effective in driving greater adoption of energy efficiency improvements in the residential sector.

For example, in Ireland, the Sustainable Energy Authority of Ireland (SEAI - national energy agency) is currently setting-up a warranty fund, co-warrantied by the European Investment Bank, to lower interest rates for households on the private financing market. However, such rates are accessible only if the household is supported by a SEAI-certified one-stop-shop for energy renovation. In France, third party-financing (mainly for deep renovation projects) has been developing trough the impulsion of the SERAFIN association and favourable regulatory changes. However, project volumes delivered by these models are very low, as some barriers remain: high costs of deep energy renovation, project complexity, lack of relocation solutions for households, lack of qualified professionals, etc.

This poses significant challenges for micro companies, as deep energy renovation projects (especially when done in a single step) require stronger collaboration, raising skills and liability issues.

4.2.3 An increased public support for offer (and demand) aggregators

The increase in collaboration and coordination previously underlined creates an opportunity for "aggregators", usually taken by general contractors, whose job is not only to aggregate the different trades required to deliver deep energy renovation projects but to coordinate them with the perspective to cut project delays by improving the logistic and execution processes. On top of that, such aggregators could carry out other activities (financing, administration) or team-up with partners to propose turnkey solutions to households. A few pioneering Member States have initiated such organisational models specifically aimed at facilitating deep renovations in a single step. France, for instance, is promoting the concept of "integrated operators"[7] covering all project aspects while Ireland is directly supporting the creation of one-stop shops dedicated to deep renovations[8].

Consequently, although not yet quantified, the ongoing trend toward business consolidation could intensify in the coming years. However, this movement appears to primarily affect small and medium-sized enterprises, rather than microenterprises, whose limited scale often prevents such alliances from being mutually beneficial. In the latter's case, the additional administrative burden of reporting obligations would likely outweigh any potential savings achieved through shared services.

Although the emergence of such operators appears necessary to scale up renovation activity, it also raises important questions about the role and business model of microenterprises. In the worst-case scenario, part of their margins could be absorbed by these larger operators—particularly if they struggle to balance their own costs and profits with the lower renovation prices expected for households. In addition, microenterprises risk losing market access if they are unable to commit to sufficient volumes. These risks make it essential to ensure that microenterprises retain their competitive edge compared to larger players. Yet, no Member State has so far developed dedicated public services that would enable microenterprises to pool resources or aggregate their offerings. In the absence of public support, private initiatives—such as the GME3clics system (see case study)—demonstrate the potential of this approach and provide a model that deserves replication.

4.2.4 A shift from dispersed efforts to industrial strategies and policies

Current strategies and policies tend to focus on low scale, fragmented and super-local approaches. If the local embedding of support systems – both for households and companies - will keep playing a fundamental role in the upscaling of energy renovation, industrialisation (through end-to-end integrated and lean processes) and demand aggregation strategies[9] are identified at a European level by the Joint Research Center as key to remove market barriers and facilitate the access to financing (Economidou, et al., 2019). They show a great potential in territories where buildings show similarities, in terms of constructive elements and technics or technical constraints. They are assessed as necessary to deliver large volumes of cost-effective renovations, especially when paired together with standard (and prefabricated) retrofit kits (such as researched and implemented by EU-funded research projects): they could cut costs by 30% and completion time by 40% (European Construction Sector Observatory, 2020), thanks to less labour intensity, shorter project lifetime and eased waste management (CLIMACT, KU Leuven, ULiège, 2023). However, demand aggregation models remain largely hampered notably by a lack of visibility on the market and by high aggregation costs that can hardly be factored in the revenue models, as deep energy renovation often

[7] See the recent public call ORENO

[8] Registered One Stop Shops | One Stop Shops | SEAI

[9] District-renovation, grouped purchasing, renovation based on similar building types, etc.

remains too expensive, with or without aggregation. Consequently, they benefit from both a policy backing notably through the EPB directive ((UE) 2024/1275)[10] and funding sources[11].

Standardisation and industrialisation can lead to technology-driven operating models relying on approaches/tools like Design for Manufacture and Assembly (DFMA), Lean production, Building Information Modelling (BIM- and BIM-related enterprise resource planning tools (European Construction Sector Observatory, 2020). Off-site construction, which remains emerging, should also see significant development on a medium-term, particularly to develop standard retrofitting packages, provided that logistic chains and skills develop consequently. However, neither industrialisation nor off-site construction of standard retrofitting packages are a one-size-fits-all solution considering the local particularities of the existing EU building stock.

Operators who will implement these strategies may be the aggregators previously mentioned, but also Regions through regional energy agencies, whose active role is specifically supported by the Energy Efficiency Directive (EU) 2023/179. Collaborations between public and private actors may also arise to better cover all strategical aspects. Indeed such operators shall have the capacity to (1) engage into advanced collaborations with the whole value chain, including public actors such as municipalities, energy agencies or regions (2) to develop the technological (BIM, digital twin) and market intelligence to develop and initiate aggregated projects (3) to absorb the high upfront costs for aggregation, as aggregation business models are currently estimated to require a bare minimum of 20-30 houses[12] to be bankable for the aggregator.

This shift will impact micro companies on multiple aspects: they will have to deal with new clients and stakeholders and may have to change their ways of working in order to raise their productivity to higher level, that these new operators will require, potentially with legal implications.

However, as demand aggregation cannot cover all market segments, a strategic thinking could be initiated to support micro companies in differentiating themselves, to better trigger and address the “customisation” market segment[13], in complement to taking part to larger projects.

4.3 By 2030, four key market drivers should gradually transform the market structure

4.3.1 Increased necessity of deep energy renovations and strategies to deliver them (staged vs. one-shot)

In housing, most works remain shallow: replacing a boiler, changing windows, adding some insulation. According to a BPIE briefing and other EU documents, the annual deep renovation rate is about 0,2% of the building stock while the general renovation rate across the EU (all interventions, including light ones) is around **1% of buildings per year** currently (BPIE, 2021) (Economidou, 2019).

[10] See article 17.11 – “Member States shall facilitate the aggregation of projects to enable investor access as well as packaged solutions for potential clients.”

[11] Such as the ongoing LIFE call “BETTERRENO”.

[12] To the best of our knowledge, this figure has not been studied. It is however the figures that we’ve heard a couple times during business workshops with large construction firms and research centers, and that we’ve experienced on the ground for district renovation projects. This number could however be lowered thanks to a better distribution of costs between actors, calling for collaborative business models with strong collaborations between public and private actors.

[13] For example, the energy renovation of houses during extension work, or adaptation for the elderly, or simply for people who will require specific material or to work with former and trusted contractors.

To reach 2040 and 2050 goals, every dwelling must at some point be deeply renovated. It is crucial for micro construction companies to understand how the market will evolve, with two main ways to get there, and a different positioning for them:

- **Staged deep renovation**: upgrades are spread out over time but planned so that all steps add up to the same deep outcome.
- **One-shot deep renovation**: the dwelling is upgraded to near-final standard in a single project.

At this stage, no data exist on the market potential per type of approach. However, a few facts point towards either one or the other approaches, with tensions in between.

With a priority to increase the volume of deep renovations as a way to deliver the energy savings objectives, access to financing become central, with 2 levers: (1) Untapping private financing and (2) achieving better cost-efficiency. Activating these levers may support one-shot deep renovations, which can explain the public backing they start benefiting at a EU level. **Private loans** for high amounts and **third-party finance** demand a strong repayment capacity, that high energy savings favour. One-shot deep renovation projects are needed to generate the required energy savings that sufficiently **increase homeowners' repayment capacity.** Similarly, third party finance, an emerging alternative to lending, can only work if the energy savings can pay-off the initial investments. To secure such high energy savings, we observe that **integrated delivery models**, **with aggregators** that take design-to-delivery risk and manage trades to enable full deep renovations, benefit from the public and financial institutions' trust. Actors with strong delivery capabilities (250+ workers) therefore see a market opportunity in favouriting scale, as it gives them a market advantage while potentially improving their productivity. However, to be bankable, such models require **a minimum threshold of investment**, which can be achieved by the number of dwellings and the depth of works. Beyond volumes, **off-site and prefabricated solutions are often quoted to lower costs**: prefabricated elements such as façades and standardised kits could shorten site time and make a one-shot upgrade less disruptive, which could convince homeowners with financing capacity to opt for them. However, such solutions remain more expensive and the volumes that would be required to significantly lower costs are not known yet. Field experimentation, with possibly EU and national funding support, may increase over the coming years with the ambition to improve the business case.

However, even with a stronger leverage of private finance, in many cases homeowners' financial reality[14] may favour staged approaches. Today, most households rely on public subsidies (which amount vary greatly between EU countries) and 0% loans (that are often not sufficient to finance a deep renovation), when they exist[15]. A contraction of public subsidies for energy renovation can already be observed in western Europe, with public budgets being significantly affected by the global geopolitical and macroeconomic context. Consequently, it is likely that (1) the remaining public subsidies will be allocated to the lowest incomes, with lower revenues thresholds than today (2) deep-renovation specific financing packages will not be accessible to the these homeowners category, either due to a lack of repayment capacity or a lack of public budget and (3) that a share of homeowners (low-medium to medium incomes) is left with a mix of public (loans) and private financing options, increasing the total cost of projects, thus making harder the business case for deep renovation. Staged renovations are the logical solution for these homeowners' profiles, under the condition that they do not create **any technical or financial lock-in**[16].

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[14] According to a recent IPSOS survey, 29% of Europeans declare being in a precarious financial situation

[15] Importantly, the availability of these schemes have been observed to change significantly and sometimes abruptly, depending on policy priorities of local or national governments and public finances, creating uncertainty and confusion for homeowners. Maintaining public support will be in any case mandatory to ensure that the lowest incomes (who often are occupying the worst performing buildings) can renovate their home.

[16] A situation in which further renovation works can't either be done due to previous technical choices or financed if the homeowner has already maxed its repayment capability with the financing of previous works.

In conclusion, for homeowners, a staged approach often feels more realistic: it spreads costs and limits disruption. It also favours local micro-construction firms, for which it is easier to integrate into a step-by-step plan, that requires limited on-site coordination and allows them to focus on their core business while keeping direct ties with households. Such approaches will keep accounting for most of demand over the next 3 to 5 years. Demand for one-shot operations might increase progressively, alongside the development of new financing products and the progressive industrialisation of energy renovation delivery models.

The "single measures" versus "whole-house package" dilemma

At the EU level, regulations and financial entities are shifting to further unlock access to financing for deep renovations:

- EPBD Art. 14-16 request that financial support must be linked to verified performance rather than isolated measures, and a higher support is required for deep or staged-deep renovations.
- The European Investment Bank (EIB) and InvestEU facilities are also expanding their role in de-risking loans for energy renovation

Some Member States have already been restructuring their intervention schemes

- France – MaPrimeRénov': offers a "rénovation d'ampleur" track with stronger support for whole-house upgrades, while older schemes still permit funding single measures.
- Ireland – SEAI Home Energy Upgrade Scheme: channels subsidies through accredited one-stop shops to deliver turnkey deep retrofits. The scheme is expected to be complemented by discounted-rates loan, backed by the EIB.
- Germany – KfW loans: pairs grants with low-interest loans to enable complete building packages rather than isolated interventions. However, although the scheme favours comprehensive renovations, it is still open to staged renovations.

What this shift means in practice

- **For households**: support becomes more conditional. Grant eligibility may depend on a minimum threshold of energy savings or following a planned renovation passport.
- **For delivery models**: aggregators that can manage comprehensive portfolios gain a competitive edge in a package-based finance environment. *(see 4.3.2, p.19)*
- **For micro-construction firms**: they remain relevant in staged renovations, but accessing public finance will increasingly require alignment with Renovation Passports or collaboration with OSS and aggregators. Without proper policy safeguards, demand could favour larger players *(see 4.3.1, p.17)*

4.3.2 One-stop-shops as key players and partners

The OSS[17] concept now benefits from **strong policy backing at the EU level**, notably through the revised **EPBD**, which sets out ambitious objectives for their development[18], the EED[19] and the "Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives" strategy (COM(2020)662), which seeks to accelerate residential energy renovation and enhance living conditions. From a financial perspective, the EU supports OSSs via **research and innovation programmes**, providing funding for awareness campaigns,

[17] One-stop-shops are structures that provide a holistic support to households all throughout their renovation project, for all aspects (financing, project design and management, contractor selection, administrative processes).

[18] Member States should implement 1 OSS/80 000 habitants, per region, with a less than 90min access by public transportation

[19] Notably article 22

training, organisational structures, and knowledge-sharing. In addition, the European Investment Bank (EIB) with **programs such as ELENA**, alongside other EU and supranational financiers has contributed to their funding. Several OSSs further benefit from complementary support at national, regional, or local levels, particularly through subsidies and programmes linked to climate and energy objectives.

A study from the Joint Research Center (JRC) of the European Commission released before the revision of the EPBD identified 56 existing or soon-to-be-launched OSS in the EU in 2020 with a total activity slightly above 100.000 projects per year[20]. Although precisely unknown, their number is now possibly up to two or three times higher. The study estimates that if the OSS renovation volume is replicated to ten-fold, then OSS may **cover about 10-15% of the desired renovation rate per year**, with **5-6% of market potential by 2030** (Boza-Kiss, et al., 2021). The success of one-stop-shops lies in their services (which should cover the full scope of the project), but also to their locally embedded focus. (Boza-Kiss, et al., 2021). The revision of the EPBD, which sets a strong supportive framework for OSS development, should allow to review these numbers upwards.

This increasing recognition of OSS as intermediaries that concentrate demand, channel subsidies, and guide households through complex procedures makes them a key partner for micro construction companies. By connecting with OSS, micro-construction firms can benefit from **increased market visibility**, **structured feedback** on quality and compliance, and **access to bundled projects** that would otherwise be out of reach.

In practice, it would also help them **adapting more quickly to evolving subsidy and regulatory frameworks,** which stakeholders interviewed during the study identified as a key challenge**.** Indeed, beyond their role in stimulating the Demand, OSS are called to play a key role in **supporting the capacity building of the construction sector**. Indeed, the article 18 of the EPBD also states that *"Member States [should] in cooperation with competent authorities, and, where appropriate, private stakeholders, ensure the establishment and the operation of technical assistance facilities, including through inclusive one-stop shops for the energy performance of buildings, targeting all actors involved in building renovations, inter alia, home owners and administrative, financial and economic actors, such as SMEs, including microenterprises".* Such services are not yet widespread and remain to be designed in many EU regions.

4.3.3 Clean Heating, Ventilation and Air Conditioning (HVAC) via individual and collective solutions for healthy homes

Most of the building heating in Europe still depends on fossil fuels (more than 57% of residential heating energy in 2020 came directly from gas, fuel oil or coal) (European Environment Agency, 2023). As decarbonating heating requires increasing the renewable energy share from 35% to 100% in 2050, a huge demand is expected for clean[21] HVAC through the development of (1) heating & cooling networks powered by renewable fuels (biomass, geothermal, large heat pumps, renewable) (2) collective and individual heat pumps powered by low-carbon electricity from the grid and (3) renovation of ventilation systems

In terms of heat pumps, in a scenario consistent with the EU's climate ambitions of REPowerEU, around 7 million heat pumps a year by 2030 should be installed (IEA, 2022)**, compared with around 2 million a year in 2021** (EHPA, 2023). In an accelerated adoption scenario, also in line with the REPowerEU objectives, the European Climate Foundation foresees the **net creation of around 3 million additional jobs in the EU by 2030**, with around **500.000 additional jobs** for installation and renovation works, in comparison with the trend scenario. It is relevant to note that, in 2022, the heat pump sector employed around 377,300 people in

[20] The report, however, does not make any difference between the different OSS models and projects. Only a few of these projects are projects with a strong support to households during the project, most of them limiting their action to informing citizens about energy renovation and guiding them throughout the first stages of the project

[21] "Clean" is used to integrate health cobenefits

Europe, more than the wind (~300,000) or solar (~826,000) sectors in the same year (Jansen, 2023) (SPE, 2024). Additionally, in countries such as France where the electricity has a low-carbon intensity and is relatively less costly than natural gas, the installation of a heat pump could be the most cost-effective individual renovation measure whereas the deep renovation (at passive house level) was cost effective only in the case with electric heating system (Mainali, et al., 2021).

Disparities between Member States should however be considered in relation with the carbon intensity of their electric energy and the local potential for sustainable heat and cold production per technology. Countries with low-carbon, affordable electricity (e.g. France, Sweden) are expected to see faster adoption of individual heat pumps, while in others the expansion of district heating and hybrid systems may be more relevant. Municipal heat mapping and zoning policies are increasingly used (and mandatory for cities > 40.000 inhabitants) to guide investment in district networks.

Beyond the pace of deployment, the effectiveness of clean HVAC will depend on how systems are designed and integrated into renovation pathways. Heat pumps and next-generation district heating networks deliver best results at **low distribution temperatures**, which often requires upgrading emitters (radiators, underfloor) and ensuring that the building envelope has already been improved. Renovation Passports can play a role in sequencing these steps to avoid oversizing and costly rework.

Ventilation and cooling are also gaining momentum, in particular through the **growing association of energy renovation with comfort and health** (e.g. mould mitigation), and as a response to more frequent heatwaves and generally warmer summers. Demand-controlled systems with CO_2 or humidity sensors are spreading, requiring careful installation and commissioning by trained installers. Balanced heat-recovery ventilation (HRV/ERV) is expanding in the residential market, as renovation provisions in the revised **EPBD now require better indoor environmental quality and efficient ventilation whenever major works are undertaken**, provided it is technically and economically feasible. Several Member States already go further: in Germany, for example, high-efficiency ventilation is mandated in multifamily projects, which reinforces uptake of balanced HRV/ERV in renovations as well as in new construction. The new EPBD also sets a **zero-emission standard for new buildings by 2030**, which effectively requires high-performance ventilation. While this target applies to new stock, it is expected to raise the benchmark for renovation as well: retrofitted homes will increasingly be measured against the same criteria of efficiency and indoor air quality (notably in term of real estate value). At the same time, **passive solutions** (shading, controlled natural ventilation, and ventilative cooling) are being promoted as low-energy alternatives to air-conditioning, which is expanding but remains contested for its electricity use and contribution to urban heat.

For micro-construction companies, this creates a dual opportunity: new work on installing and maintaining more sophisticated ventilation units, and growing demand for simple, low-tech measures (shutters, insulation adjustments, airtightness improvements) that improve comfort without active cooling. Demand for installation, commissioning, and maintenance in the HVAC sector will grow sharply *(see 4.5, p.22),* but quality requirements and certification standards will also tighten. Skills in system balancing, sensor setup, and long-term maintenance will be critical to meet both energy and health objectives in homes. Firms that invest in specialised training can secure a stable role in this expanding market.

4.3.4 A growing need to integrate environmentally friendly materials and technologies

Recent European regulatory developments – notably the CSRD, the EPBD, the EU Taxonomy Regulation, and the revised CPR – impose new requirements around material sustainability, disclosure, traceability, and performance. As a result, there is (1) a growing need to integrate environmentally friendly materials and technologies, which requires greater knowledge and use of environmentally friendly materials and clean technologies (such as heat pumps and renewable energies), and (2) a growing importance of circular

practices, especially for construction and demolition waste (CDW) management (CEDEFOP, 2021). Micro-enterprises will need to adapt.

Although micro-enterprises are not directly subject to the European taxonomy requirements, they may feel the effects through **two main channels.** On the one hand, **financiers** (banks, funds) that must demonstrate that their portfolios are aligned with the taxonomy may request more detailed environmental data or direct their financing towards activities deemed 'green'. On the other hand, **large companies subject to the CSRD** may require ESG information from their suppliers, including micro-enterprises, to consolidate their own reporting. This dynamic may lead to a risk of exclusion for certain activities not classified as sustainable and create a significant administrative burden for small structure. Remaining competitive may require them to invest in compliance (testing, documentation, traceability) and possibly reconfigure their supplier relationships and processes, as they will be asked to provide much more technical and environmental data, select more durable and sustainable materials,

Additionally, the recast EPBD establishes stronger life-cycle Global Warming Potential (GWP) requirements for new buildings and enables Member States to incorporate embodied carbon into MEPS if they choose. While there is not yet a binding duty for energy renovation, some stakeholders (e.g. ACE) recommend that National Building Renovation Plans include full life-cycle emissions[22], and some Member States may voluntarily extend these requirements to deep renovation projects.

However, opportunities do exist: companies already positioned in sustainable activities may benefit from easier access to certain financing and public support mechanisms, while simplified ESG reporting standards for SMEs are being rolled out to reduce these constraints.

4.4 Specific challenges in terms of jobs and skills

The construction sector (NACE 41, 42, 43), provides jobs to 13 million people (7% of total EU jobs) of which 40% are employed in two jobs families (20% in electrical and plumbing activities and 20% in building completion and finishing). On average, most of the European workforce is employed in specialised construction activities (NACE 43), half in construction of buildings (NACE 42) and one sixth of it in civil engineering (NACE 41). **Around 70% of the construction sector's workforce is employed in six Member States:** Germany, France, Spain, Italy, Poland and the Netherlands. **Micro companies employ 46% of the total workforce** (Eurofound, 2024) versus 30% across all sectors (EURES European Labour Authority, 2023).

These few figures illustrate **the economic and human challenge behind the expected boom of energy renovation**, as market evolutions previously described will require to upskill and reskill most of this workforce. Additionally, EU and national studies forecast the construction sector to be the sector with the **most net job creation (existing jobs and new jobs)** due to the low-carbon transition (CLIMACT, Oxford Economics, Federal Planning Bureau, 2016) (European Commission. Directorate General for the Environment., Cambridge Econometrics., Trinomics., & ICF, 2018) (CLIMACT, KU Leuven, ULiège, 2023). This contrasts with the severe labour shortages that the sector suffers from. In that context, access to training and measures tailored to micro companies, who face specific challenges and may lag behind larger companies, is urgently needed to increase training participation, develop their attractivity and their retention capacity.

4.5 Renovating Europe will require a tremendous amount of new and different jobs and skills

Error! Reference source not found.presents a projection of the evolution of existing construction jobs (based o n NACE codes 41.20 to 43) in France. As market drivers are estimated to be the same for all EU countries,

[22] ACE guidelines for the transposition of the recast EPBD by Member States

it is assumed that the observations are replicable to other member states. The value on the X axis corresponds to transformation scores (how much a given job will require different skills) compiled from the French *Observatoire des Métiers* scoring, while the value on the Y axis corresponds to an in-house estimation of the job volume future evolution[23] (in a 3% renovation rate scenario).

As several assumptions had to be made due to data discrepancies, a confidence level has been assigned to each estimate. A detailed evaluation of the impact for each job can be found in Appendix 1 *(see 9.2, p.51).*

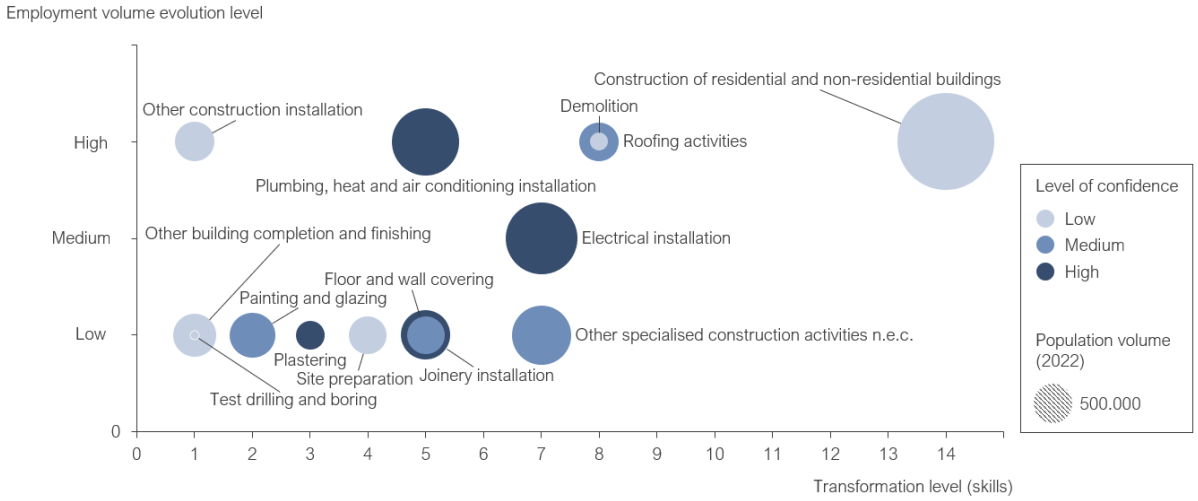

***Figure 3** - Potential impact of the transition on jobs volume and skills demand, based on Observatoire des métiers du BTP, Eurostat, and CLIMACT analysis*

4.5.1 Specific impacts on the jobs volume

In terms of jobs volume, energy performance of buildings and clean HVAC are the two market drivers that will require the most job creation. Energy performance requirements should roughly impact half of the construction jobs through insulation techniques, processes and materials.

For clean HVAC, a modelling work performed by Cambridge Econometrics suggest that the large countries of Western Europe (Germany, France, Spain, Italy) would be the main beneficiaries in terms of volume of job creation, because they combine a large building stock with large-scale incentive policies (Cambridge Econometrics, 2022). The countries of Central and Eastern Europe, which often start with a more carbon-intensive heating system (many old coal and gas boilers), also have significant employment potential (Poland). **Overall, all member countries are affected by a transfer of labour from activities linked to fossil fuels** (production and distribution of fuel oil and natural gas, manufacture of conventional boilers, etc.) **to activities linked to new technologies** (manufacture of heat pumps, installation, maintenance, insulation, management of heating networks, etc.). **After the intense phase of initial deployment (2020-2035), new installation activity is expected to slow down as 2050 approaches**, once the stock has been almost entirely converted. Nevertheless, the need for human resources will remain high to maintain the millions of systems installed; to replace the first generations of HVAC systems at the end of their service life (a heat pump has a service life of around 15-20 years), and to continue improving the energy performance.

4.5.2 Specific impact on skills

In terms of skills, the study conducted by the French Observatoire des Métiers du BTP shows that most of the trades will transform, some more than others. Construction professionals of the future will be

[23] Currently, no data is available to estimate the long-term evolution of job volumes in the EU across the different NACE codes

characterised by a balance of core soft and technical skills, as well as relevant knowledge and agile and evolving behaviours – offsite manufacture, onsite placement and assembly, logistics, digital design (European Construction Sector Observatory, 2020). The mutations in skills of the side-trades (painting and glazing, plastering, floor and wall covering, joinery installation) are mostly induced by new modes of collaboration (integration of these jobs in the design phases and deep communication with other trades). The development of reuse and the use of bio-based materials are inducing better resource management and new techniques, processes and materials. Industrialisation (off which off-site construction is a result) will require managerial and technical skills to be increasingly intertwined, especially in higher level occupations. At last, the development of off-sites factories will create new employment opportunities for skilled trades, and new apprenticeships (European Construction Sector Observatory, 2020)

The analysis suggests that the energy performance of buildings and the development of new modes of collaboration will be the two most impactful market drivers on skills. Error! Reference source not found.4 b elow shows the consolidated impact of market drivers on jobs using data from the aforementioned study. Results should be read as such: the higher the score, the higher the number of jobs impacted and the level of transformation of these jobs. In other words, analysis suggests that the energy performance of buildings and the development of new modes of collaboration will be the two most impactful market drivers on skills.

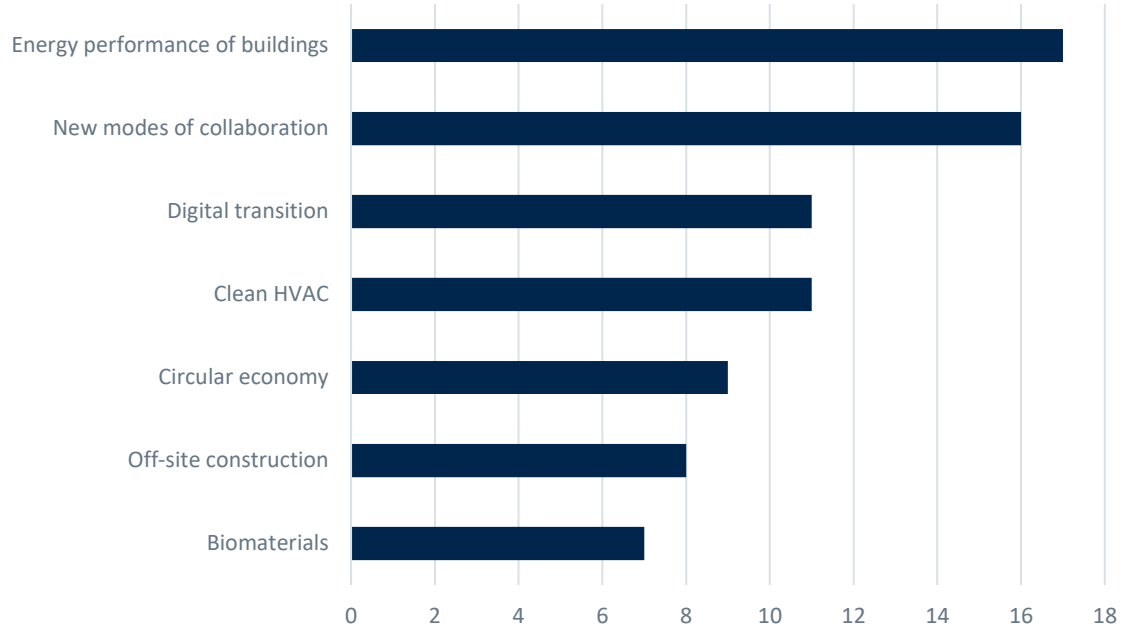

Figure 4 - *Impact of market drivers on skills. Calculation by CLIMACT based on scores given in from Observatoire des Métiers du BTP, 2021.*

4.5.3 New jobs required

Next to the evolution of the existing jobs displayed in Error! Reference source not found.**, energy renovation w ill require the creation of new direct and indirect jobs** like district renovation coaches, jobs related to heating and cooling network development (facilitator, technician, urban planner) and the industry of climate-neutral heating system production (heat pumps) and its supply chain (e.g., calorific fluid), etc. (CLIMACT, KU Leuven, ULiège, 2023). The skills required for these jobs are a first cycle of tertiary education diploma, in-depth climate renovation skills and knowledge, technical skills (e.g. in heating, electricity, conception work), and transversal skills such as soft skills (management, flexibility, communication, adaptation, creativity) and digital. (CLIMACT, KU Leuven, ULiège, 2023). The potential volume of these new jobs cannot be assessed with a sufficient level of trust.

4.6 Labour shortages structurally increase the skill gap

The 2008 crisis severely impacted employment in the construction sector, with an uneven recovery across countries. Between 2008 and 2015, the EU construction sector **lost around 3 million jobs** - approximately one-fifth of its workforce. Although employment has broadly returned to pre-crisis levels since 2015, countries such as Italy, Greece, and Portugal continued to experience negative trends up to 2020. (Eurofound, 2024) (EURES European Labour Authority, 2023) (GROW, JRC, 2023)

Labour shortages are increasing, despite a declining unemployment rate. Since 2012, labour shortages have worsened across Europe, and nearly half of all occupations currently facing shortages are in the construction sector. This growing mismatch reflects deeper structural issues in the labour market. (EURES, 2023). As shown on **Error! Reference source not found.5**, 19% of EU construction companies declare s uffering from labour shortages, with however very high discrepancies between countries.

However, statistics on shortages must be interpreted carefully. Firstly, this is due to the years of reference (pre- or during the pandemic). Second, because of the methodology used to compile them, which is often declarative (as here, in **Error! Reference source not found.**) and based on job vacancies, which does not r eflect the reality of companies. Indeed, interviewed stakeholders report that many companies do not even advertise vacancies because they know there will be no applicants. All participants agreed that the **actual situation of shortages is much more worrying than the data showed in different surveys.**

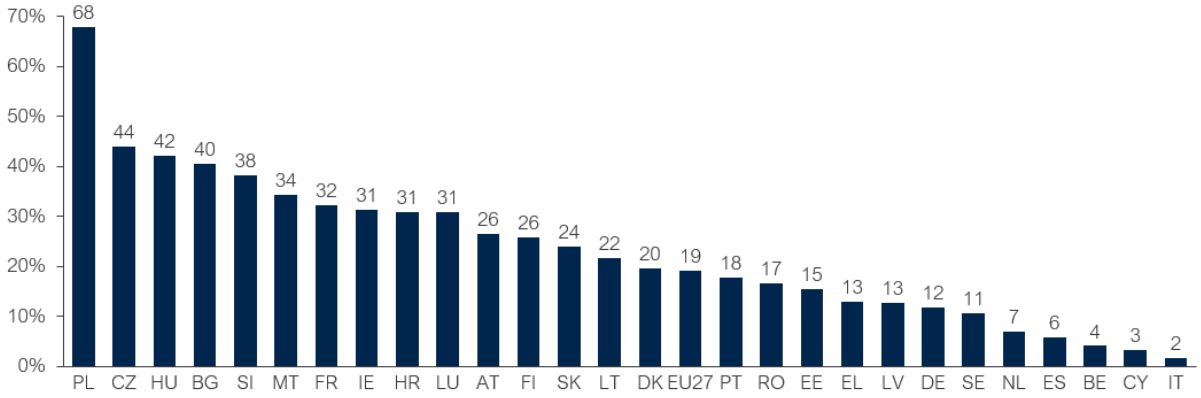

Figure 5- Share of companies in the construction sector suffering from shortages in 2020. Source: Eurostat [ei_bsbu_m_r2].

At last, an ageing workforce is worsening the skills gap. As the current workforce ages and retires, labour shortages are expected to intensify—just as the demand for skilled workers is set to rise significantly in response to the EU's 2040 renovation and climate targets (CLIMACT, KU Leuven, ULiège, 2023).

To address shortage, future policies should however adopt a more comprehensive and regulated approach. Indeed, interviewed stakeholders share that recent experiences show that some policies aimed at decreasing shortages and increasing energy renovation activities can have a significant impact on recruitment, but can also lead to malpractice due to the involvement of untrained new companies and workers. Certification requirements for new construction companies should be part of any policy mix designed to increase the renovation activity, the latest being often accompanied by a wave of business creation.

4.7 To close the gap, additional and tailored measures for micro companies are needed

Micro companies are essential to the employment in the construction sector but face unique and persistent challenges that hinder their ability to attract, retain, and upskill workers. These obstacles are particularly acute in the context of evolving labour markets and growing demands for skilled labour. On one hand, in general terms, limited resources and a variety of employment models make it often difficult for micro companies to compete with larger firms in terms of employer attractiveness and training opportunities. However, on the other hand, (micro) construction companies with local anchorage and built as family businesses offer solid local employment perspectives and growth potential but may face more difficulties in accessing the training and hiring networks. At last, micro companies are a solid creator of non-relocatable jobs. Addressing these issues requires targeted support to improve both recruitment and access to professional development.

4.7.1 Micro companies require specific support to increase their attractivity

Despite being a fertile ground for entrepreneurship, micro companies in the construction sector face specific and structural barriers in attracting and retaining workers, especially young people.

They often face challenges due to challenging working conditions (that are general to the construction sector) and limited career development opportunities compared to larger firms (EURES, 2023). Micro companies often lack the resources to offer constant training, career progression, and stable employment that larger companies can provide – "hours spent on training can be perceived especially by small and micro enterprises as a loss of working hours, with no guarantee of return on investments" (European Construction Sector Observatory, 2020). This makes them less attractive employers overall (OECD, 2023), contributing to the sector's ongoing difficulties in attracting and retaining skilled labour. This can however be nuanced to some extend: while they lack large training programmes for lifelong learning, micro construction companies significantly contribute to training through apprenticeship.

Moreover, around 75% of construction companies (of all sizes) struggle to meet OSH requirements[24], and 40% of workers operate in unsafe conditions. To address this, the broad construction sector would need to increase OSH-related training by 60% (European Construction Sector Observatory, 2020). While some progress has been made in improving working conditions, more efforts are needed (EURES, 2023).

Moreover, the status and instability of employment in construction also contribute to its lower attractiveness. The sector has a significantly higher rate of self-employment - 24.4% compared to 13.8% across all sectors in the EU (ELA, 2023) - and a notable share of workers on fixed-term contracts, particularly in countries like Poland, Spain, and Portugal. In contrast, some countries such as France rely more on interim workers (10%) to adjust workforce size, which often results in more precarious jobs (The Shift Project, 2021). Furthermore, extensive use of subcontracting complicates the coordination of efforts to improve working conditions and pay (EURES, 2023).

At last, micro companies often lack access to recruitment networks and do not have the human resource strategies or capacities needed to navigate increasingly tight labour markets. Their limited financial and organisational resources frequently prevent them from implementing practices that could support workforce retention, such as providing training opportunities. Small firms often struggle to access guidance on how to recruit effectively *(EURES, 2023)*. In France, for example, most micro companies believe that improving the

[24] This figure is given by the ECSO, as quoted. It has however been subject to significant discussions between stakeholders during the study, with possible statistical bias being pointed out. As it is the only official number that exist at a EU level, this study considers it, with this limitation.

public perception and valorisation of construction work is the most valuable support public authorities could offer *(Observatoire des métiers du BTP, 2021)*.

These recruitment challenges are pushing some companies to lower their qualification requirements, impacting their capacity to deliver (quality) projects. In France, for example, the share of employees without diplomas in construction rose from 14% in 2011 to 21% in 2016 (Observatoire des métiers du BTP, 2021). According to the European Labour Authority (2023), the biggest challenge currently facing micro companies is precisely the difficulty in finding employees with the right skills. Without a significant investment in training, micro companies risk falling behind, further widening the skills gap.

4.7.2 Micro companies require specific support to increase their access and participation to training

Micro companies face multiple challenges to access and participate to training

Micro companies in the construction sector face distinct and pressing challenges when it comes to accessing and participating in training programs - challenges that risk deepening both current skills shortages and the sector's unpreparedness for an acceleration of energy renovation. A core issue is that the overall level of education among construction workers remains low, particularly in structural trades, with many new entrants lacking adequate initial training or formal qualifications, relying instead on learning directly in the field (The Shift Project, 2021).

Their limited financial capacity often prevents micro companies from affording constant training programs for their employees, both in terms of cost and the inability to allocate work time for learning. Unlike larger companies, **micro companies typically cannot absorb the short-term loss of productivity (which is already low) that training periods entail**. Moreover, the current training systems are often not agile enough to adapt to the specific and evolving needs of workers or small employers. Many trainings offers lack flexibility, are poorly supported by public administrations, or remain financially inaccessible, both for small employers of self-employed migrant workers who additionally face further cultural and linguistic barriers and represent from 8% to over 50% of the workforce in some Member States (Eurofound, 2024). These issues are exacerbated by the fact that some training programs are not officially recognized or integrated into professional pathways, further discouraging participation (European Construction Sector Observatory, 2020).

The structure of the construction workforce, often working under temporary contracts and subcontracted, further complicates the situation. In many countries - particularly in Poland, Spain, and Portugal – these forms of contracts prevail (Eurofound, 2022), making long-term training investments less viable for employers. Migrant and foreign workers also make up a significant share of the workforce, ranging from 8% in Denmark to more than 50% in Cyprus (Eurofound, 2024). Because these workers are often outside the scope of company-based upskilling strategies, accessible, inclusive, and publicly funded training becomes essential. However, such training remains insufficiently developed.

At last, posting poses a major issue, as the construction sector is one of the **primary sectors** using posted workers, alongside industries like manufacturing and transport. While posting come with strict compliance with host country rules that impact job quality such as remuneration, maximum working hours, health and safety, etc., it unfavours countries with lower job quality who are consequently reluctant in investing workers training, as there is a big chance that these workers will leave or be posted to other countries (mostly Western ones). This issue should be delt with at a European level, to generally level-up and harmonise job quality and define rules that secure countries' investments into training.

Investing in skilled workers provides a clear return on investment

There is clear evidence that investment in training workers to increase and extend their skill set pays off. Multi-skilled workers can reduce total project costs by up to 5% and lower labour requirements by as much

as 35% *(McKinsey Global Institute, Reinventing Construction: a route to higher productivity)* (European Construction Sector Observatory, 2020). Apprenticeship schemes and adult learning programs, especially when combined with on-the-job training, have also proven effective in upskilling and reskilling workers. The provision of vocational education and training (VET), especially when integrated into college-based or formalized learning paths, can play a pivotal role in addressing these deficits. **However, micro companies are at the heart of a structural mismatch: they are vital players in the construction sector but remain largely excluded from the very training systems that could support their growth and resilience – due to the lack of resources and to the mismatch between the skills needed by the companies and those taught in VET centres**.

European discussions should consider heterogeneous situation across EU countries

Error! Reference source not found. **shows that the participation of construction companies (of all sizes) to t raining has been evolving very differently across Europe**, with both striking progress in a fifth of countries and strong disengagement from lifelong learning in half of EU countries. The participation in training and education is high in countries from North Europe (Finland, Denmark, Sweden) and lower in Eastern countries (Romania, Bulgaria, Hungary) (ESCO, s.d.). Considering the relative weight of each country, the participation to training has decreased by 13% in average in Europe, reaching an average of 7% (See Figure 7)

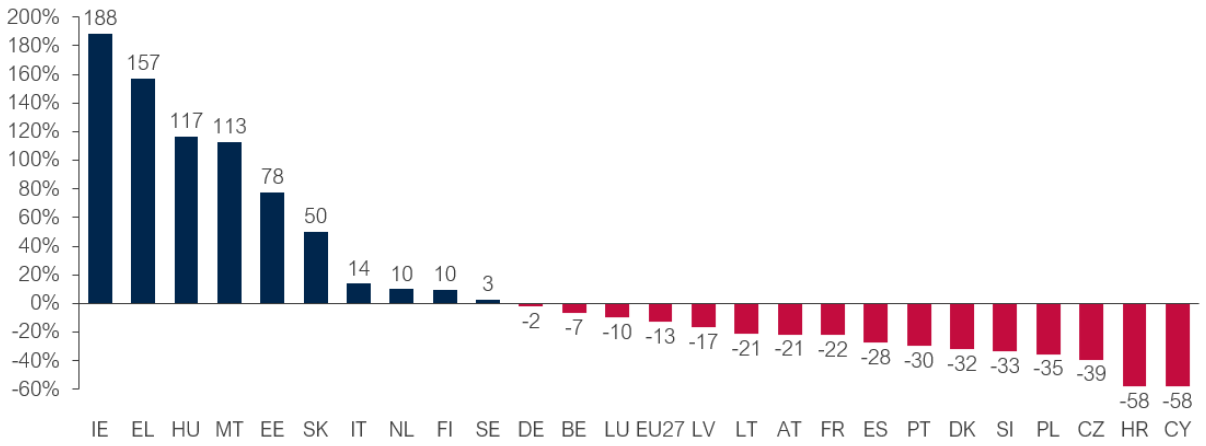

***Figure 6**- Evolution of adult participation in education and training (2013-2020), from ECSO data.*

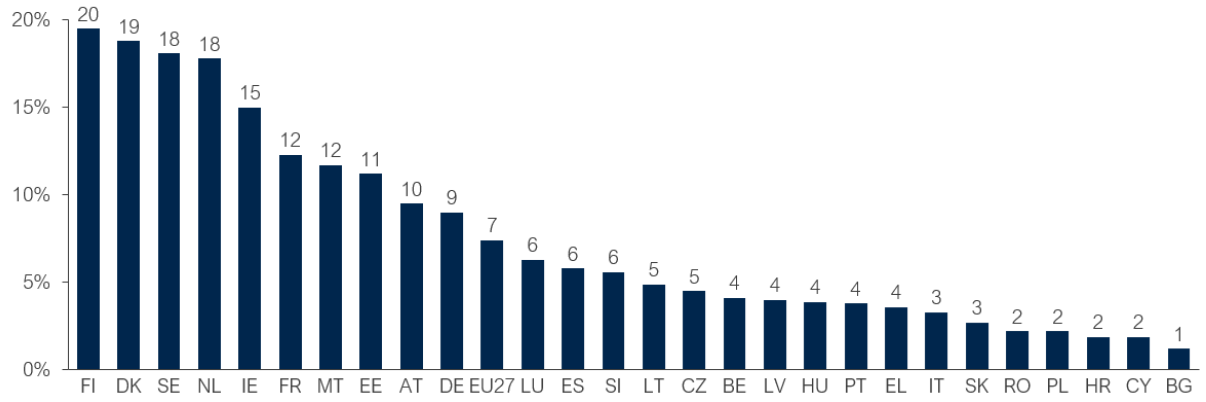

***Figure 7**- Participation in education and training of adults (2020)[25], from ECSO data.*

Examples from EU countries can inspire future training policies

The German *Meister* training system offers a compelling model for skill development in micro companies. It combines advanced vocational training with business management education, enabling skilled workers to become certified master craftsmen (*Meister*). This dual focus not only raises professional standards and product quality but also empowers individuals to start and run small enterprises successfully. By integrating hands-on expertise with entrepreneurial skills, the system supports sustainable growth and innovation in micro-sized businesses.

Ireland mandates that every new worker, whatever the company size, receives both general induction and role-specific health and safety training. Specialized sectors, notably construction, require new workers to hold valid certifications such as the Safe Pass (mandatory 1-day health and safety awareness certification, valid 4 years) and, if applicable, additional licences like CSCS cards, manual-handling, working-at-heights, etc. **Enforcing the training obligation by law** rather than simply recommending the practice is probably the most powerful way to raise quality levels, provided that it comes with the **appropriate financial support** to companies, which is the case in Ireland. In particular, from July 2023 through December 2026, Ireland operates a €150 million per year training Support Scheme to aid firms in strategic employee training and capability development. Eligible companies (including small and micro-enterprises) can claim training aid, subsidising part of training costs to improve competitiveness under EU state-aid rules.

This study further investigates *(see case study)* the case of **Spain's Fundación Laboral de la Construcción**, who has transformed construction training by making basic OHS courses mandatory and linking them to the TPC card system for site access. It offers broad vocational programs across trades and emerging fields like renewables, developed with employers and unions to ensure high quality and shared resources. Training now integrates modern tools such as simulators and e-learning, while additional services include a job-matching portal and a labor trends observatory to connect training with employment and industry needs.

[25] Except for Romania (2018) and Bulgaria (2013)

5 Specific challenges for micro companies in terms of operating model

The construction sector suffers from a generally low productivity. Across Europe, trends vary. While some countries have seen modest productivity growth, others show near stagnation. However, **Error! Reference s ource not found.** shows that the productivity of construction is close to stagnation, with an average of 2% gain between 2010 and 2021. This disparity is illustrated in the figure below. In this context, it is important to note that the productivity growth of micro companies has been significantly smaller than that of large enterprises (GROW, JRC, 2023).

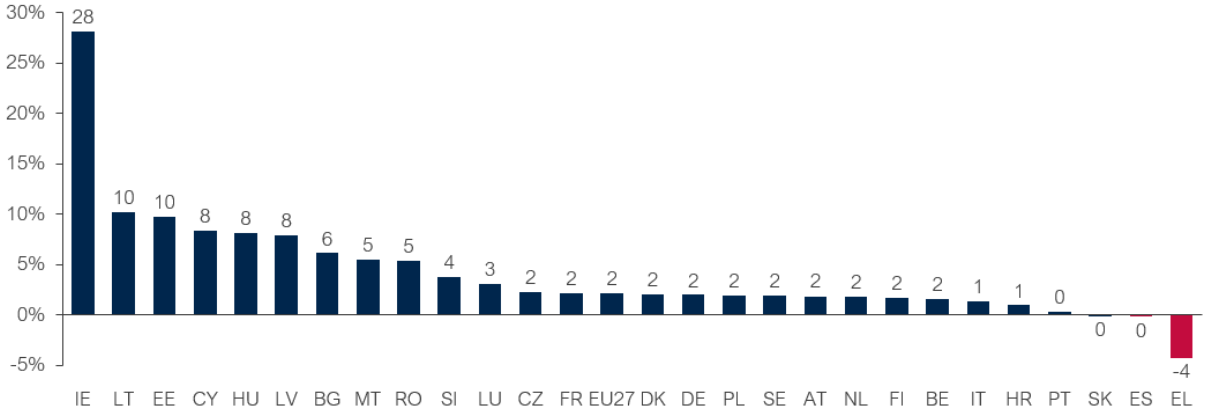

Figure 8 - Productivity evolution from 2010 to 2021 (All construction companies, from ECSO data)

Increasing the sector's productivity is mandatory for energy renovation to take-off. **As described in 4.2, without necessarily being a one-size-fits-all solution, industrialisation and standardisation are expected to gain significance, requiring significant evolutions of the operating model of construction companies.**

As the construction sector evolves toward more integrated, efficient, and digital models, micro companies face growing pressure to adapt. Traditionally reliant on informal networks and artisanal know-how, micro companies will need to position themselves within structured ecosystems that promote collaboration, innovation, and market access. At the same time, increasing expectations around process efficiency, more sustainability in models and results, and digitalization raise the bar for participation. Without targeted support, these shifts risk marginalizing micro companies.

5.1 From informal networks to structured ecosystems to gain direct market access

Beyond just delivering construction and renovation projects in a linear model of collaboration, **value now increasingly lies in knowledge exchange, coordination, and long-term collaboration** (Buildwise, 2024). **This comes as a challenge, as most of the micro companies are using informal networks (professional relationships, ancient collaborators)** rather than structured collaborations through official partnerships, co-contracting and shared engineering. (Observatoire des métiers du BTP, 2021)

The **growing complexity** of construction and renovation processes, the emergence of **new technologies** and the **tightening of legislation and regulations** call for closer collaborations and more intensive exchanges of knowledge. In Belgium for example, new models such as the *bouwteam*, Design & Build (D&B), or DBFMO (*Design, Build, Finance, Maintain & Operate)* contracts foster more integrated approaches, sometimes involving permanent teams of architects or general contractors overseeing the full project. Although these

models are currently mostly set-up for non-residential or substantial residential projects by professional clients, they bear a great potential to improve household's trust and satisfaction during the renovation process, through more interaction and support (Buildwise, 2024).

To remain competitive, small firms must embrace these new models, understand their legal frameworks, and invest in a combination of industrialization (e.g. prefabrication and/or localised off-site construction, when business-relevant), digital tools (BIM, AI), and cross-disciplinary skills. Indeed, not only (bigger) contracting companies will be looking for partners able to integrate themselves in such project organisation, but these models could offer them a direct access to the market (as there is potentially less subcontracting) thus allowing them to increase their productivity (by being less dependent, provided they are able to organise) and to capture a higher share of the added value.

The widespread implementation of One-Stop-Shops for energy renovation is expected to strongly support the development of ecosystem-based collaboration. An OSS model that would highly benefit to micro companies is one that partners with craftmen and craftwomen cooperatives, such as Retrofitworks in the UK *(see case study)*. For micro companies, working with these platforms is essential, especially since they often lack the time and expertise to properly assess household needs—particularly when no architect is involved in the project design. By partnering with OSSs, micro companies can benefit from tools and structured feedback on their work, helping to foster long-term relationships—unlike in traditional projects, where client feedback is rarely consolidated and often lacks constructive insight, as clients are not building professionals. However, as OSSs expand, the introduction of labels or specific qualification requirements for partner companies is likely. These standards must remain accessible to micro companies to ensure their continued inclusion in the renovation market.

5.2 Lean construction to improve process efficiency

Standardisation and industrialisation, through the implementation of lean construction models, are a powerful way to increase productivity. One of the challenges in the construction industry has been that due to the project-based setup, basically all processes are built new for each project. Repetition is lacking, resulting in difficulties in measuring the status of the processes, in setting development targets, and in measuring the effect of development (Pekuri et al., 2015). However, scaling-up energy renovation requires to significantly improve the productivity of renovation projects, given the very limited resources and the financial accessibility issues.

Larger companies may gain a significant advantage over micro companies for projects where standardisation is key *(e.g.* collective renovation projects such as condominiums or neighbourhoods) and for which **micro companies may therefore remain tier 2 or 3 suppliers**. Indeed, they seem much likelier to be able to implement lean construction principles at a reasonable transaction cost. These principles are the following : (*i*) eliminate waste and variability; (*ii*) precisely specify value from the perspective of the ultimate customer; (*iii*) clearly identify the process that delivers what the customer values (the value stream) and eliminate all non-value adding steps; (*iv*) make the remaining value adding steps flow without interruption by managing the interfaces between different steps; (*v*) let the customer pull — do not make anything until it is needed, then make it quickly; and (*vi*) pursue perfection by continuous improvement (Tezel et al., 2019). **Of these six principles, only (v) seem applicable by micro companies without a strong training effort**.

However, with the appropriate support, the structuring of ecosystems as developed in 5.1 is a way to reconcile craftmanship and industrialisation. Developing a fully industrial operating model does not seem very appealing for micro companies who generally have no inspiration to grow but rather want to respond with agility to the local demand. Beyond that, the cost-benefit balance of developing such models would not be favourable to them (lack of resources, time and skills to do so) and does not represent a strategic opportunity that they should be pursuing. However, by partnering and joining ecosystems, micro companies can together form an industrial operating model. In France, the Dorémi "organisation" and the "GME 3 clics"

(see the case study at the end of the report) - temporary grouping of companies" type of contracts are concrete examples of how micro companies can with support (free of charge in the second case), organise together to deliver a global and highly performing energy renovation. For local micro enterprise to preserve (and gain) market shares requests however significant guidance and support from external actors, especially policy makers and public officials.

The development of lean management raises significant challenges in terms of operating model transformation, but also in terms of business/company management. Indeed, lean management requires the company to be able to define its business model, with a specific identification of the sources of revenues and services that allow these revenues. However, construction companies have several difficulties defining their business model logic and therefore do not apply a specific logic in defining their price (which is often cost-based) and choosing their projects. To work efficiently, construction companies should choose only the projects that fit their business model this in order to achieve economies of scales (Annunen & Haapasalo, 2023).

5.3 Achieving the digital transition

The digital transition is a powerful driver for process innovation, circularity, and market development in the construction sector. It enables the industrialisation of processes and supports the emergence of new products, systems, and working methods that can significantly enhance organizational performance and open new business opportunities (CLIMACT, KU Leuven, ULiège, 2023) (Observatoire des métiers du BTP, 2021) (European Construction Sector Observatory, 2020). As the heart of this transition, the effective use of data from construction should be a growing performance factor for energy renovation companies given the increasing importance of high energy efficient works together with low-carbon intensity of materials. For example, the Opengela one-stop-shop in the Spanish basque country has developed a tool that cross-analyse databases to deliver a visual mapping of buildings energy performance to support them in identifying the poorest energy-performing buildings to efficiently target their actions towards homeowners. However, construction stands out as one of the **lowest-scoring sectors** in terms of business digitalization, especially in comparison with manufacturing, retail, or service industries (ECSO, 2021).

Tools such as **Building Information Modelling (BIM)** or **digital twins** (which aggregate many sector-specific digital technologies) are very powerful to support demand aggregation strategies through a better characterisation of the building stock. For example, the city of Helsinki (Finland) has developed a complete 3D map of the city, which allows not only to view the urban planning, but also the single buildings' data. The city of Herrenberg (Germany) has developed a complete digital Twin, which offers the possibility to explore the city in virtual reality. **Robotics, 3D printing, virtual reality and artificial intelligence** also show promising use cases to support energy renovation.

Nevertheless, **adoption of such core tools is limited, especially among SMEs** (ECSO, 2021). For example, in France, research shows that the use of digital tools by construction companies is directly correlated to their size : 80 to 100% of intermediary size companies use digital tools, and it falls to 40 to 60% for SMEs and less than 40% for micro companies (Observatoire des métiers du BTP, 2021). Thus, while the digital transition strongly supports market development and access, it can make entry harder for micro-companies (Observatoire des métiers du BTP, 2021). Beyond differences linked to companies' size, polls suggest that digitisation rates vary greatly across EU countries[26], and are strongly linked to the legislative framework in place (ECSO, 2021).

Yet, there is **a growing policy focus at the EU level** to accelerate digital transformation in construction, including via the Competitiveness Compass (2025) and funding via Horizon Europe, Digital Europe,

[26] Denmark and Austria are leading, while southern countries significantly lag behind.

InvestEU, etc. However, such programs may leave behind micro companies, who are generally less integrated within EU-funded research projects, and targeted support should be intensified to prevent the gap with larger companies – who mainly drive the digitisation of the sector (ECSO, 2021) - to widen. Indeed, the growing use of automation, process computerisation, and BIM requires new skillsets and work methods that many micro companies are not interested in or not yet equipped to handle (limited resources, time, and digital skills), potentially **widening the gap in market access and competitiveness** (European Construction Sector Observatory, 2020). For example, a Belgian one-stop-shop has requested companies to propose quotes based on a virtual visit of locations, to cut the logistic costs. Whereas it could appear simple, many micro companies may be reluctant to the solution, by lack of trust in the tool and a preference for on-site visits, which they consider more reliable for accurately assessing the work to be done. **Supporting the use of BIM across micro companies seem crucial,** as it also generates cobenefits regarding the other market drivers identified in this report: BIM use supports a better cooperation with the various project stakeholders and improves the projects' performance.

The **overall need for micro companies to accelerate their digitisation with regards to the market drivers developed in this study can however be nuanced.** The necessity to use specific digital tools is greatly determined by project's characteristics (size, presence or not of an architect, role of energy assessors and one-stop-shops, etc.). For example, BIM remains mostly used during the design phase[27] of large-scale projects, on which micro companies are not (and will probably not be more) involved. In other words, some residential market segments (aggregated projects, collective housing) will require micro companies to master digital tools, whereas it will be relatively less decisive for market access in others (individual projects on detached or semi-detached houses, with tailor-made solutions), yet crucial to cut costs and improve productivity.

5.4 Synthesis

Table 1 below delivers a synthesis of the relative expected impact of each market driver on micro companies' operating models and skills.

The table should be read as follows: a market driver will relatively (light grey), strongly (light blue) or very strongly (dark blue) require micro companies to change their modes of collaboration / their process & operations / accelerate their digitisation and impact the skills they need (volume and/or nature of skills)

Scoring is based on observations made in this report and come from a CLIMACT analysis, challenged with key stakeholders during a workshop. The purpose of the analysis is to provide a sense a relativity between all impacts. In other words, all market drivers will have an impact, some more than others.

[27] Although insights from recent case studies suggest that using BIM throughout all project phases can reduce project timelines by an average of 20% and costs by 15%, while decreasing design errors by 0% and RFIs by 25% (Karan, et al., 2025)

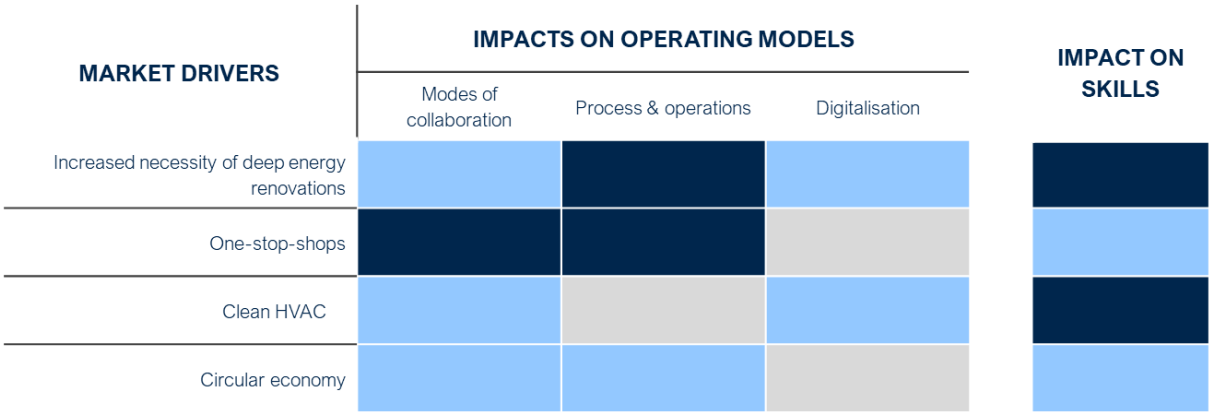

Table 1 - Synthesis of market drivers' impacts on skills and micro companies operating models

5.5 Policy suggestions to support micro companies' operating model transformation

Improving access to financing

When micro companies do receive public financial backing, they experience a higher added value than other enterprises (CSES, et al., 2021), underlining the importance of well-designed and accessible support mechanisms.

Micro companies across Europe face significant financial pressures, driven by **rising operational costs** and **shrinking consumer purchasing power**. To address these challenges, targeted financial support policies are essential. These include direct aid such as grants for creative and business development, subsidies for (IT) equipment purchases, tax relief measures - particularly VAT adjustments tailored to the capabilities and needs of the craft and microenterprise sectors - and the provision of low-risk loans.

Improving access to innovation funding through federations

The difficulty in securing financial resources is often compounded by a lack of information about available funding opportunities, new technologies, relevant regulations, and access to research, patents, and innovation trends. This limited access contributes to a lower level of satisfaction with public support compared to larger businesses. An impactful action could be to effectively ensure that micro companies are **duly represented within EU-funded projects' consortiums through their representative federations**, notably to experiment solutions so that their design better integrate their needs.

Leveraging companies' creation and takeovers to ensure sustainable business strategies

Each year, a very high volume of companies is created, or in the worst case, goes bankrupt. **Figure 9** shows that in average, in 2020, there were more companies created than bankruptcies[28]. At present, business takeover support programmes do not question economic models and focus mainly on subjects related to business management itself. It would be interesting to explore how these programmes could include new subjects, in line with the observations made in this report, which would enable entrepreneurs to strengthen their ability to address the energy renovation market from the outset.

[28] Due to the lack of periodic data, the most recent data was used. Despite the COVID-19 pandemy, 2020 was kept for the analysis as the construction sector did not suffer from the COVID-19 crisis as much as other sectors.

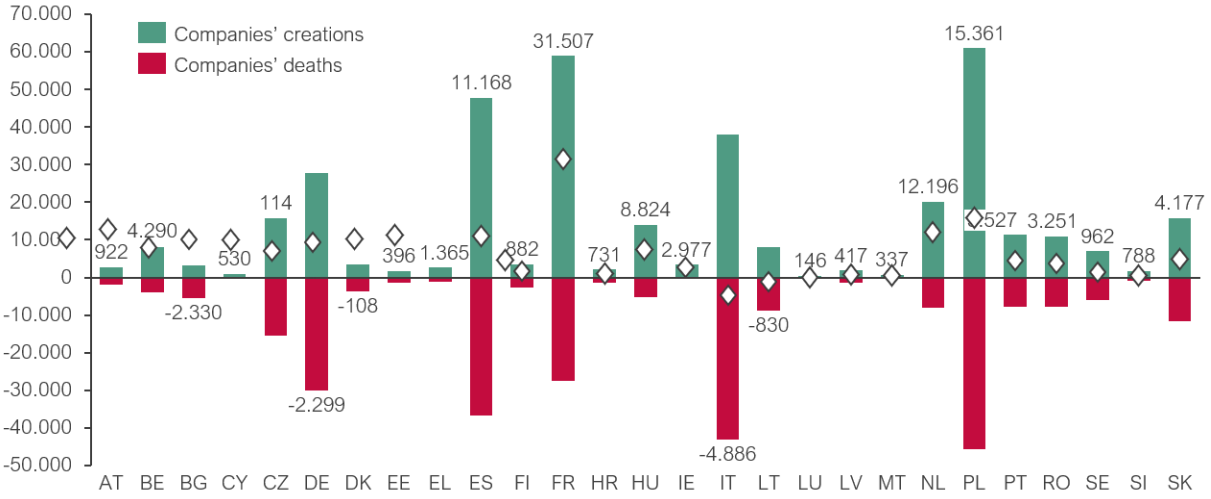

Figure 9 - Creation and deaths of construction companies in 2020. Consolidation by CLIMACT based on ESCO data.

Centralising services to improve their productivity

It would be interesting to explore how services can be centralised for micro companies, in order to outsource the complexity of projects and enable them to focus on their core business. For example, today some players that consolidate SMEs take care of the technical and economic modelling of projects, including when LCAs are required, as well as back-office tasks and centralising purchasing. One-stop shops provide part of the answer. Joining forces between micro companies is to this purpose a strong lever, and craftmen and women cooperative models seem well fit about it.

6 Specific strengths of micro companies to deliver energy renovation

Micro companies occupy a unique position in the residential energy renovation market. Their small size, often perceived as a constraint, proves to be a source of flexibility and specialization that aligns closely with several current and upcoming market dynamics. Nonetheless, it is worth underlining that some of these strengths are also put at risk by some of the evolutions described in this report.

Specialization and niche expertise

The added value of micro-enterprises lies largely in their specialization in a specific trade. This expertise can extend to rare techniques or particular building types and materials (e.g., stone, traditional wood, natural insulation). In a context where demand will increasingly be structured around aggregated projects but where a need for tailor-made solutions will remain, this specialized know-how is a key asset. It also enables these actors to better negotiate their position vis-à-vis project aggregators or one-stop-shop operators by offering skills that are difficult to substitute.

Trust-based client relationships

Relationships between micro companies and their clients often rely on geographic and social proximity, fostering a strong foundation of trust. This relational advantage translates into customer loyalty and strong local reputations. However, this strength can be mitigated by the perception of security provided by the warranties and insurance offered by larger companies, a point frequently raised during sector workshops.

Organizational flexibility and adaptability

Their small scale provides significant agility: micro-enterprises can participate in projects through various contractual forms — cooperatives, co-contracting, or subcontracting. This flexibility facilitates their integration into increasingly complex value chains and allows them to address the market's diverse needs, particularly amid the rise of integrated one-stop-shop solutions. Limitations, notably the difficulty of rapidly shifting strategic direction or absorbing major technological transformations, should nonetheless be noted.

Local anchoring and access to niche markets

The inherently local nature of micro companies aligns perfectly with the strong territorial focus required by one-stop-shops. These companies can serve rural or less attractive areas, sometimes occupying a quasi-monopolistic position. This allows them to address unmet needs while reinforcing their legitimacy within local communities.

Advantage linked to scarcity and evolving skills

The current shortage of specialized construction skills, particularly in ventilation and air conditioning (HVAC), benefits micro-enterprises that possess these capabilities. Nevertheless, this advantage may evolve as robotics and artificial intelligence progressively enter the construction trades. Strengthening local training programs — already accessible to many micro-enterprises — will be crucial to maintain their competitive edge.

Emerging alignment with circular economy trends

The growing demand for sustainable and circular renovation solutions, including the use of bio-based and recycled materials, offers new opportunities for micro companies. Their small scale and craft-oriented approaches often make them more adaptable to experimenting with innovative materials and techniques. By positioning themselves early on these emerging practices, micro-enterprises could reinforce their competitive advantage while contributing to broader decarbonization goals.

7 Analysis of stakeholders' perspectives

The perception of challenges and priorities related to energy renovation **varies significantly** across the stakeholders interviewed. For trade unions, this topic remains complex and somewhat distant: their primary focus lies in improving wages and working conditions. While they acknowledge energy renovation as an inevitable and growing trend, national unions do not actively engage with it; their stance is generally more reactive than proactive. A **geographical divide** also emerges: Nordic countries are more advanced in this transition, whereas Central and Eastern European countries face competing challenges and show greater skepticism about the pace and depth of change, largely due to funding constraints.

Significant gaps in maturity between European countries were also observed. Moreover, most stakeholders interviewed were introduced to the concept of one-stop shops for the first time during these discussions. On topics such as industrialization and market aggregation, some demonstrated a strong understanding and well-informed stance, while others, although grasping the concept, did not yet perceive the gradual shifts already underway—particularly in terms of evolving strategies and support policies. These disparities, and in some cases a clear lack of maturity, underscore the need to reinforce awareness and training efforts around ongoing and upcoming policy and market developments. This would help foster more balanced dialogue between sector representatives and policymakers, especially in the context of implementing the revised Energy Performance of Buildings Directive (EPBD).

Both the study and stakeholders also highlights a crucial point: **while certain trades stand to benefit substantially from this transition, others may face severe impacts**. Without significant support for transformation, some sectors risk losing competitiveness. This is particularly true for insulation and building envelope trades, where methodological and regulatory shifts in energy performance and decarbonation requirements can either elevate or sideline specific expertise. This ambivalence is paradoxical: although it must absolutely be addressed, leaving it unresolved prevents the clear direction needed to develop emerging sectors capable of generating local employment for craftsmen in the medium to long term. This calls for **a more carefully planned transition, involving all trades and social partners.**

Consequently, stakeholders emphasize the value of **extending the joint governance model**—currently more common in Western and Southern Europe—and **strengthening cooperation on the ground**. They highlight the need for reinforced dialogue at both national and EU levels between construction trades and related professions. For instance, there is little clarity today on how institutionalized dialogue operates nationally between builders and architects.

Stakeholders diverge in their views on the role of industrialization strategies in energy renovation. While these strategies are expected to expand, they require substantial adaptation efforts for micro-enterprises. For some, this adaptation is not only necessary to maintain but potentially increase profitability. For others—who form the majority—the shift toward scaling up introduces complexities that may outweigh the anticipated economic benefits.

8 Case studies

This section delivers 3 case studies on concrete examples of how to support microconstruction companies in better collaborating and upskilling.

8.1 GME 3 CLICS: a digital platform for temporary construction consortium

GME 3 CLICS is simple digital platform launched by CAPEB (the French confederation of crafts and small building companies) in 2023 to help small construction and craft companies collaborate and deliver integrated energy renovations. It allows **to form temporary consortiums and jointly offer coordinated, all-in-one renovation services** (CAPEB, 2023). By leveraging local stakeholder collaboration from craft enterprises to regional CAPEB chapters and public bodies, GME 3 CLICS aims to **scale up building retrofits** while addressing key barriers through integrated service models and training support.

8.1.1 Problem statement

France, like much of Europe, faces an urgent need to massify building renovation to meet climate targets and cut energy costs. 97% of French construction firms have 10 or fewer workers (CAPEB, 2023), and traditionally each specializes in a single trade. Homeowners seeking deep retrofits (e.g. insulation, heating and ventilation) often struggle to navigate multiple contractors.

At the beginning of the project, public policies are raising the bar – for example, updated grants (MaPrimeRénov' 2024)[29] incentivize comprehensive "global" renovations, effectively pushing small firms to combine their skills or risk losing business (CAPEB, 2023). Only, deep renovations are still too rare.

In parallel, large building companies (including former new-home builders) are entering the renovation market with turnkey offers, threatening to sideline local artisans or relegate them to subcontractors (Le bâtiment artisanal, 2024). This can result in a lower quality of service due to overly standardised and less adaptable interventions.

France's context demanded new collaborative models: to meet **ambitious retrofit goals**, policymakers needed the vast network of small contractors on board, which required removing barriers to teaming up and providing a framework for **integrated renovation services**.

8.1.2 Case analysis

Starting point: Market and regulatory context in France

By 2025, France's policy landscape strongly favours scaled-up, high-performance renovations. Generous incentives like *MaPrimeRénov'* subsidies have been restructured to encourage multi-trade, deep renovation projects rather than single measures (CAPEB, 2023). Crucially, as of January 2024, homeowners get the highest grants only for coordinated renovations involving several building trades (e.g. insulation and HVAC), spurring demand for one-stop-shop solutions.

Local artisans are the backbone of renovation activity, but operating alone, they struggle to offer "global" retrofits spanning multiple specialties. Additionally, legal constraints discouraged collaboration – under French law, contractors in a formal *groupement* (joint venture) are typically jointly liable, a risk small firms are unwilling to take.

The CAPEB designed GME 3 CLICS to make it easy, safe, and practical for artisans to partner.

Proposed solution

The solution devised by CAPEB was GME 3 CLICS – a free, secure web portal and mobile app that makes forming a *Groupement Momentané d'Entreprises* (temporary consortium) to act as a one-stop-shop platform for contractors. Key features of the solution include:

[29] MaPrimeRénov' is suspended from June 2025 to September 2025.

- **A marketplace to post or find multi-trade projects:** where artisans can publish or browse job postings. For example, if an insulation specialist gets a client request requiring an electrician and a roofer, they can post the project description in the app. Nearby colleagues can then **candidate to co-execute** the project (CAPEB, 2023) (Le bâtiment artisanal, 2024). An intelligent project form captures all necessary data, which later auto-fills into contract documents – streamlining paperwork.
- **A directory to identify qualified local partners:** lists companies willing to co-contract. Each profile shows the firm's trades, qualifications, and contact info, helping artisans find trusted partners (e.g. a mason can quickly locate an available plumber in the same area).
- **An integrated chat to coordinate as a single team with client:** a WhatsApp-based chat for each project group. All consortium members and even the client (if desired) can be on the same message thread, sharing updates or troubleshooting in real time. This ensures the "single interlocutor" experience – one unified communication hub – and fosters trust and teamwork among the artisans.
- **An automated legal contract generator:** a robotized generation of contracts that are legally robust, simple, and crucially structured to avoid shared liability. The app provides templated, lawyer-vetted co-contracting agreements between the companies, and a model single contract for the client, covering the entire scope of work. This removes the intimidating legal burden that often deterred SMEs from formal groupings. Notably, the **contracts are structured "without solidarity"** – meaning each contractor is liable only for their own tasks, not for the whole job (a critical workaround pending legislative change). By simplifying legal and administrative steps, the tool lets artisans **focus on the technical work** instead of paperwork.

In practice, the GME 3 CLICS model works as a bottom-up one-stop-shop: Instead of a homeowner approaching a retrofit concierge service, the homeowner can still call their local craftsman (builders, electrician, etc.) as usual – but that craftsman now has the means to pull in other trades and present a unified offer.

Stakeholders mapping

CAPEB emerged as the central stakeholder driving GME 3 CLICS. As the national federation representing ~60.000 artisan builders, CAPEB recognized it must mobilize its members for the renovation wave. It engaged stakeholders at multiple levels:

- **Local construction SMEs**: the primary users and beneficiaries of GME 3 CLICS. By joining the platform, electricians, plumbers, masons, etc. can find partners and form consortia to bid on larger, multi-trade projects they could not execute alone. They also gain a single interface to customers, rather than confusing homeowners with separate contracts per trade.
- **CAPEB's regional and departmental chapters:** CAPEB rolled out GME 3 CLICS through its local offices, ensuring buy-in and training at the grassroots. Local CAPEB staff serve as on-the-ground promoters and support for artisans using the tool.
- **Homeowners (clients):** While not direct users of the platform, homeowners are key stakeholders benefiting from this model. GME 3 CLICS enables a "one interlocutor" client experience, addressing a major pain point – clients prefer a single, coordinated renovation provider rather than juggling multiple contracts. Satisfied clients in turn generate more renovation demand.
- **Government and public agencies***:* Public authorities indirectly influence and support the initiative. Additionally, the platform aligns with national programs like *Mon Accompagnateur Rénov'* (home renovation advisors) by ensuring that once a homeowner has a renovation roadmap, local contractors can actually deliver it collaboratively. Though not formally part of GME 3 CLICS, public energy agencies and financing bodies are important enablers (through advice, grants, or zero-interest loans) that make comprehensive renovations feasible for clients.
- **Training partners:** Manufacturing companies and training centres also come into play. For instance, CAPEB's partnerships with material suppliers (e.g. insulation firms) often include training modules for artisans, complementing the GME 3 CLICS effort by updating contractors' technical skills for energy-efficient renovations.

- **Tech and legal partners:** CAPEB developed the GME 3 CLICS tool in-house but in consultation with artisans (ensuring user-friendliness for non-tech-savvy users). It also partnered with legal experts to provide standardized contracts.

Overall, the initiative knits together a network of local stakeholders – craftspeople, their professional association, and supportive public actors – to tackle the renovation challenge collectively.

Implementation plan and strategies

Rolling out GME 3 CLICS required a combination of advocacy, capacity-building, and phased deployment, moving from concept to reality in under a year. The alignment of the tool with stakeholder needs (legal, technical, operational) has been a cornerstone of its implementation strategy.

- **CAPEB action to simplify legal rules (e.g. liability reform).** Even as the app launched, CAPEB worked to change the regulatory environment. It drafted a law proposal to eliminate joint liability for consortium projects under €100,000, gaining support from multiple Members of Parliament and the Ecology minister (CAPEB, 2024). This top-down push complements the bottom-up tool – if passed, it would permanently remove a major fear factor and likely boost participation. In the interim, CAPEB's legal team structured the app's default contracts to avoid solidarity clauses, giving craftsmen confidence to group without new legal risks.
- **Pilot and early feedback phases launching (2023).** CAPEB initially introduced GME 3 CLICS in late 2023 to a subset of users and gathered feedback. Early adopters (often CAPEB members known for innovation) tested the platform on real projects. Their input led to improvements – for instance, by Batimat 2023 the app was refined enough to win an innovation award (Le bâtiment artisanal, 2024). This iterative approach ensured the final tool was user-friendly for artisans who may not be tech experts.
- **Leveraging the CAPEB network (2024).** A core strategy was to use CAPEB's **decentralized network** for outreach and training. France has CAPEB offices in every region, which regularly interact with local builders. CAPEB hosted demos and workshops through these chapters, to train companies on using the app and on best practices for co-working. Additionally, CAPEB pre-created accounts for all its member companies in the system, so that an artisan need only enter their business ID to activate their profile (Le bâtiment artisanal, 2024). This *opt-out approach* vastly accelerated adoption by removing signup friction – thousands of contractors find their details already in GME 3 CLICS, ready to be used.
- **Integration with training programs.** Alongside the app, CAPEB continues to run training and certification programs crucial for quality renovations. Through its "*Ma Formation Bâtiment*" platform and partnerships (with energy efficiency product manufacturers, for example), CAPEB offers courses on insulation techniques, heat pump installation, airtightness, etc. These upskilling efforts ensure that when artisans do form a GME team, they collectively have the modern skills to achieve high energy performance.
- **Continuous improvement of the application.** The GME 3 CLICS platform is built to evolve. CAPEB signalled that new functionalities (possibly matching with *public* tenders, AI-driven project matching, etc.) are in development (CAPEB, 2023). They also established feedback channels (through the CAPEB local offices and directly via the app support) so that user suggestions can be incorporated.

8.1.3 Results and impact

It is still early to measure long-term outcomes like energy savings or number of homes renovated via GME teams. However, the initial trends are encouraging as thousands of contractors are now digitally connected and ready to respond collectively to France's renovation needs, an essential step toward closing the renovation gap.

- ✓ **SMEs can now bid on comprehensive renovations they previously avoided.** Small artisans are now competing for larger, holistic renovation contracts. This levelling of the playing field helps preserve the diversity of the construction sector. CAPEB's noted the app helps craftspeople "*remain competitive in face of the big operators investing in the renovation market*" (CAPEB, 2023). In turn, homeowners get more choice of providers and often a more personalized local service.

- ✓ **Preservation of local business against large competitors.** If each active consortium tackles deep renovations that individual firms would have otherwise avoided, the overall renovation rate will rise. Early anecdotal reports indicate artisans have started using the marketplace to assemble teams for comprehensive projects in insulation and HVAC upgrades that they previously turned down due to lack of capacity. GME 3 CLICS effectively creates a self-reinforcing loop: more collaboration leads to more completed renovations, which builds confidence and stimulates further collaboration.
- ✓ **Reduction of coordination and legal barriers.** Artisans report that having ready-made contracts and a clear framework makes them more willing to engage in group projects. Also, CAPEB's interim fix of excluding solidarity between companies (each firm only liable for its own work) addresses the biggest legal and psychological obstacle. This is an important impact on the mindset in the sector: joint work is no longer seen as too risky or complicated.
- ✓ **Stakeholder engagement and policy impact.** The support from the Ecology minister for CAPEB's liability reform indicates that government sees value in empowering SME networks (CAPEB, 2024). If the proposed law to relax joint liability passes, it will be a direct win attributable in part to this initiative's advocacy. The recognition given by the innovation award from Batimat also put a spotlight on the approach, potentially inspiring similar platforms or copycat models in other regions (BATIMAT, 2024).
- ✓ **Training and quality gains.** Although harder to quantify in the short term, there are indications that working through GME 3 CLICS improves renovation quality and workforce skills. The consortia formed often include RGE-qualified contractors (*Reconnu Garant de l'Environnement*, a French quality label), which means projects meet high energy-efficiency standards. By collaborating, artisans ensure better sequencing and integration of retrofit measures, likely yielding better energy performance (e.g. airtightness achieved by joint planning of insulation and ventilation).

8.1.4 Key learnings

GME 3 CLICS shows that closing the renovation gap is not just about tech or money but organizing local actors and aligning with legal needs of stakeholders.

- **Shared liabilities are acting as disincentives**, **especially for small companies.** Further investigation should be carried out to understand whether legal reforms should be advocated for with regards to that matter. Solution may also lie in specific trainings and support to design such liabilities.
- **OSS must be seen as an ecosystem more than a single entity**. Aggregating small players but letting them full governance by implementing an OSS model as a decentralized network. The key is having the right coordination tools and agreements in place.
- GME 3 CLICS is a **replicable and highly adaptable model for empowering SMEs** to deliver OSS renovations.
- The impact of digital tools can be multiplied when paired with trainings.
- While GME 3 CLICS is widely praised by artisans for simplifying administrative tasks and enabling group responses to multi-trade renovation offers, there is little publicly available feedback from clients confirming whether the customer experience (in terms of coordination, clarity of responsibilities, cost, quality) improves measurably.

8.2 Fundación laboral de la construcción: building an inclusive, skilled construction workforce

Fundación Laboral de la Construcción (FLC) is a Spanish non-profit **paritarian organization** established in 1992 **to improve training, safety, and professional development in the construction industry**. It was created as a joint initiative by the National Construction Confederation (the CNC, an employer's confederation) and two major trade unions (CCOO del Hábitat and UGT-FICA).

In the three decades since its creation, FLC has grown into a cornerstone of construction training in Spain. It operates through **17 regional councils** and a nationwide network of **around 45 to 50 training centres,** delivering over **200 different training specialties** with the help of **1,400+ expert instructors**.

Each year, tens of thousands of workers pass through FLC's classrooms – in fact, the foundation trains an average of over **70,000 construction professionals annually**, providing more than 3 million hours of training per year. Notably, a large portion (about one-third) of this training is dedicated to occupational health and safety, reflecting the industry's commitment to risk prevention. This extensive reach and capacity make FLC a key player in addressing skills development and labour shortages in the construction sector. (Fundación laboral de la Construcción, 2025). (E.N.T.E.R., s.d.)

8.2.1 Problem statement

In the early 1990s, Spain's construction industry faced **serious challenges**: a high rate of workplace accidents, a largely unskilled or informally trained workforce, and fragmented training efforts across companies and regions.

At the same time, the industry was growing rapidly (fuelled by infrastructure booms and a housing expansion), but it lacked a structured system to develop skilled labour and promote quality workmanship.

The gap in vocational training and safety awareness undermined both productivity and worker well-being. Employers and labour unions often had adversarial relations, which made coordinated industry-wide training initiatives difficult. The problem was clear: how to professionalize the construction workforce and improve safety standards on a national scale, in a sector traditionally known for low qualification requirements and high accident rates.

8.2.2 Case analysis

Starting point: Business and regulatory context

The formation of FLC in 1992 was a direct response to this skills and safety deficit, set against the backdrop of new national policies on workforce training (e.g. Spain's National Collective Agreement for the Construction Sector). The business context of the time was characterized by a construction boom as well as Spain's integration into the European Union, bringing stricter safety directives and quality standards that the industry needed to meet.

This regulatory foundation ensured that FLC had the authority and resources to reach workers nationwide. In essence, the starting point combined a pressing industry need (safer, more skilled labour) with a **supportive policy framework that enabled unions and employers to collaborate on a common solution** (European Paritarian funds construction, 2015). Such an initiative relies on **strong collaboration between employers and workers' representatives,** i.e. on a system of social partnership (paritarianism).

Proposed solution

Instead of isolated company trainings or ad-hoc initiatives, FLC offers an integrated approach: developing standardized curricula, certifying competencies, and promoting best practices across the industry.

- **Introduction of structured training programs in occupational health & safety (OHS)** for all construction workers. FLC emphasized basic safety courses as a prerequisite for site work, laying the groundwork for the *TPC card system* that formally links training to employment.
- **Broad-based vocational training in construction trades** from bricklaying and carpentry to crane operation and now emerging fields like renewable energy installation. The foundation acted as a

hub to design these courses in consultation with industry experts and to make them accessible throughout Spain.

- **Leveraging the collective support of employers and unions** by pooling resources and knowledge to develop high-quality training content and invest in infrastructure that no single company or union might sustain alone.
- **Incorporation of modern pedagogical tools and innovation** into construction training. This has meant adopting new learning technologies – for example, simulators for machinery operation, interactive e-learning platforms, and even serious-game style training modules (Fundación laboral de la Construcción, 2025).
- **Extension to employment services and industry research** with an online job portal and placement service (ConstruyendoEmpleo) to connect trained workers with employers (Fundación Laboral de la Construcción, s.d.), and it established an observatory to analyse construction labour trends.

Stakeholders mapping

- **Trade unions and employers together at the governance (creation and operation)**: the Confederación Nacional de la Construcción (CNC) representing employers, and on the other hand, the construction federations of major unions (CCOO del Hábitat and UGT-FICA). These groups jointly govern the foundation, making all decisions in a bipartite manner (the board and committees have equal representation from employers and unions).
- **Public authorities**: The Spanish government and regional authorities are key stakeholders as well, providing regulatory oversight and often co-financing training programs (for example through labour ministry funds or European Social Fund projects).
- **Construction companies**: Large firms and SMEs are both contributors and beneficiaries. They finance training through the collective agreement and rely on FLC to train their workforce in safety, trades, and new techniques.
- **Workers and job seekers in the construction sector**: the primary beneficiaries as they participate in FLC courses to gain certifications (such as the *Tarjeta Profesional de la Construcción*, a card certifying one's training) and improve their employment prospects.
- **Training professionals and centres**: FLC employs over 1,400 instructors across Spain and collaborates with more than 400 affiliated training centres to deliver courses (Fundación Laboral de la Constrcutción, 2016).
- **Industry bodies and EU partners:** involved through various projects lead by FLC or as partners in European initiatives (like the *Build Up Skills* program and the *Construction Blueprint* project) to align construction training with EU standards and innovation trends (Construye 2020+, 2021)

Data and evidence

- **Scale**: FLC trains 70,000 trainees annually and exceeded 2 million total trainees in 2022. In total, more than 3 million training hours/year have been given with 200+ specialties offered – covering topics from basic safety to advanced technical skills.
- **Expansion**: In 2024 alone, FLC provided training to 110,000 professionals, a 6.5% increase over the previous. (Fundación Laboral de la Construcción, 2024)
- **Inclusion**: Women correspond to around 9% of workforce. The *Women Can Build* pilot helped to include women into the training. 6,000 women have been trained in 2020 (8.5% of trainees).
- **Refugee integration**: The "Welcome Work" pilots set place in 2024-2025 and allowed the first cohorts of 20+ refugees to be trained in trades via FLC centres.

8.2.3 Results and impacts on partner enterprises

✓ **Increase in safety on construction works.** One concrete outcome is that basic safety training has become ubiquitous – it is now standard that anyone entering a construction site has at least a general 8–20-hour safety course completed (often via FLC). This shift correlates with a reduction in

accident incidence rates over the long term; although Spain still battles high workplace accident figures.

- ✓ **Increase in workforce professionalization.** Hundreds of thousands of workers have obtained the FLC-issued TPC card, which serves as a portable record of their qualifications. The foundation's programs in new areas (like BIM – Building Information Modelling, energy-efficient construction, etc.) have started to equip the industry with the emerging skills needed for modern challenges.
- ✓ **Increase in employment in the construction sector.** Given the cyclical nature of construction employment in Spain, FLC often provided retraining for unemployed builders after the 2008 crisis and is now helping attract young talent into a sector facing an aging workforce. (Fundación Laboral de la Construcción, s.d.)

8.2.4 Key learnings

FLC's model shows how **sector-wide cooperation** can modernize construction training and address labour shortages critical to renovation massification.

- **Scale, diversity and flexibility are essential.** FLC's ability to train over 100,000 professionals in 2023, delivering more than 5.3 million training-hours through nearly 12,000 different courses, shows the importance of both scale and diversity in course offerings. Flexibility in training modes (in-person, mixed, tele-training) allows meeting varied learning needs and overcoming logistical barriers.
- **Strong social partnership (employers and unions) underpins legitimacy and sustainability.** Because FLC is jointly governed by employer associations and trade unions, it has sector-wide credibility, wide mandate, and continuous funding through sectoral contributions. This helps ensure alignment with both business needs and worker welfare. That structure makes it easier to respond to regulatory or policy changes and to scale up programs nationally.
- **Adapting training content to emerging needs (energy, digitalization, green skills).** FLC is undertaking multiple EU-cofounded projects to update curricula for green transition, clean energy, renewable systems, sustainable construction methods, and digital methods. It shows the necessity for continuous updating of vocational training to match evolving technology, regulatory demands, and market requirements.
- **Inclusion (women, youth, migrants) increases talent pool and social impact.** Projects like **Women Can Build**: redefined vocational training to be gender inclusive; collected hundreds of stakeholder inputs; trained women; raised awareness. FLC has launched *Welcome Work* to integrate migrants and refugees, recognizing these groups can help address labour shortages while also promoting social inclusion. FLC uses combined physical and online actions and orientation programs to channel youth into construction trades.
- **Importance of innovation in training delivery.** Free online platforms, virtual campus, blended learning modes, MOOC-style short courses, and technical resources (manuals, "construction dictionary") help widen access. Having mobile or localized training interventions (e.g. delivering training in specific provinces or through regional centres) helps reach remote or underserved workers. While less detail specifically about mobile units is available in recent sources, FLC's regional network helps with localization.
- **Data and transparency boost stakeholder trust and guide strategy.** Transparent reporting of outcomes (number trained, courses delivered, inclusion metrics) enables identifying where gaps remain (e.g. energy-specialty courses, female participation, geographic coverage) so that strategy can be adjusted.
- **Regulatory alignment and synergy with financing schemes matter.** FLC shows the benefit of synchronizing with policy vehicles (EU programs, national policy on green transition, digitalization), leveraging public and EU funds alongside sectoral funding. Being able to co-finance projects, get subsidies, or participate in international consortia (Erasmus+, LIFE etc.) expands capacity and innovation potential.

8.3 RetrofitWorks: a cooperative One-Stop-Shop for home renovation in the UK

RetrofitWorks is a pioneering not-for-profit cooperative in the United Kingdom that has been mobilizing local supply chains and communities to scale up home energy-efficient renovations since 2013. Its mission is to make UK homes healthier and more energy-efficient by uniting homeowners, skilled local installers, material suppliers, and community groups in a one-stop-shop retrofit service (Anon., 2025).

RetrofitWorks is a multi-stakeholder cooperative of around 450 SMEs (Innovate, 2020), that delivered more than 3.000 retrofit projects around UK. The cooperative brings together two sets of members: **practitioners (certified and local retrofit SMEs)** and **advocates (local stakeholders and potential consumers)** (JRC, 2021). All practitioner companies must be *certified and trained* (e.g. holding PAS2030 or TrustMark accreditations) before joining, to guarantee high-quality work, building homeowner confidence in the network (SHAP, 2020). Specific trainings are also provided by the cooperative itself, through collaboration with specialised companies.

8.3.1 Problem statement

In the UK, housing accounts for roughly 20% to a quarter of carbon emissions, so improving home energy performance is critical (Anon., 2025) (Co-operatives UK Limited, 2024). Millions of households want to reduce energy use and decarbonize, and many can afford to invest, but they hesitate due to market failures **– a lack of independent advice, unreliable quality, fragmented supply chains, limited financing options, and skills shortages**.

The low uptake of top-down programs (e.g. Green Deal, Green Homes Grant) underscored the **need for trusted intermediaries** at the community level who can address homeowners' concerns and link them with skilled contractors (Co-operatives UK Limited, 2024). In short, the challenge is building a model that overcomes fragmentation and mistrust, ensuring retrofits are accessible, quality-assured, and attractive to all parties involved.

8.3.2 Case analysis

Starting point: Business and regulatory context

The cooperative emerged in 2013 as an alternative delivery model just as the UK was grappling with how to scale retrofits post-Green Deal (Anon., 2025). Notably, the UK introduced **PAS 2035**[30], a new retrofit quality standard (from 2019) mandating a "whole house" approach and certified Retrofit Coordinators to oversee projects (National Energy Foundation, 2024), creating demand for coordinated services and quality assurance.

Meanwhile, local governments and community organizations are increasingly seeking solutions to meet Net Zero commitments by launching pilot programs and creating a supportive context.

In 2018 RetrofitWorks teamed with the Greater London Authority to launch **Ecofurb**, a retrofitting public-private service for London (Anon., 2025). In 2019, RetrofitWorks joined forces with Low Carbon Hub and the National Energy Foundation to pilot **Cosy Homes Oxfordshire**, an ongoing project supported by a UK government (BEIS) grant. It aims to design and test an end-to-end domestic whole house retrofit service for the able-to-pay market in Oxfordshire, building on existing experience of this model from RetrofitWorks. (Low Carbon Hub, 2021).

Proposed solution

[30] PAS stands for Public Available Certification. It is a type of standard developed in collaboration with industry stakeholders and published by the British Standards Institution (BSI). PAS standards are designed to address specific needs in various industries quickly, offering best practices and guidelines without the need for lengthy development processes typical of formal standards. PAS 2035 and PAS 2030: retrofit, accreditation and certification

- **A one-stop-shop model**: single point of contact for homeowners to get whole house retrofit plans (PAS 2035-compliant) and retrofit coordinator to oversight for quality, w**ith financial facilitation**: navigating grants, offering clear pricing.
- **A cooperative network for local SMEs**: local installers certified, trained, given consistent work, w**ith integrated training and material partnerships**: upskilling contractors via manufacturer and partner-led courses.
- **Community and local authorities' partnerships**: local groups build trust and drive demand.

The economic model is **service-oriented**: contractors earn direct income from retrofit work, community advocates might earn modest commissions or funding for their efforts, and the cooperative sustains itself on fees **without profit-taking**, aligning with its non-profit status (JRC, 2021).

Any surplus revenue is re-invested into the cooperative's mission and services or shared in ways that benefit the membership as a whole – like expanding services, training members, improving the IT platform, or reducing future fees (JRC, 2021). This translates to a steady pipeline of retrofit projects for members instead of monetary payouts from co-op profits.

Stakeholders mapping

RetrofitWorks' cooperative model brings together a wide range of stakeholders, aligning their interests towards mass retrofit:

1. **RetrofitWorks practitioners:** certified companies wishing to carry out retrofit advice, assessment, design, coordination, and installation. All practitioners are fully trained, including PAS 2030 accreditation for SME businesses. SMEs and micro enterprises can apply following open membership policies.

    a. **Coordinators, assessors and designers**: experts accredited to plan and oversee retrofits (as required by PAS 2035). They conduct home assessments and create tailored whole house improvement plans, ensuring measures are suitable and sequenced.

    b. **Local contractors and installers**: builders, plumbers, electricians, and specialists who perform the retrofit works. They become members of the cooperative, gaining access to retrofit training and project opportunities while adhering to quality standards (PAS 2030).

    c. **Suppliers & material manufacturers**: providers of insulation, heating systems, and other retrofit products. RetrofitWorks collaborates closely with suppliers, especially those offering local or sustainable materials and trainings, to support the supply chain (Lime Green, 2021).

2. **RetrofitWorks Advocates:** organisations that represent a constituency of potential customers, acting as trusted advisers on their behalf.

    a. **Community organizations**: local energy or climate groups, cooperatives, and social enterprises that help engage citizens with outreach and trust-building (Low Carbon Hub and several village-level climate groups for Cosy Homes).

    b. **Local authorities and government bodies**: city or regional authorities and national agencies (BEIS in the Cosy Home Oxfordshire) co-initiate schemes or provide funding, branding, and policy support to scale retrofits, lending credibility and aligning the retrofit service with public programs.

    c. **Trade associations and councils**: professional institutions representing over 100,000 small construction businesses (Parity project, 2013) like the Federation of Master Builders (FMB)

within the Haringey Council[31] help spread awareness and trust in the cooperative, encouraging local contractors to sign up (RetrofitWorks, 2018).

3. **RetrofitWorks Associates:** operate as 'supporting friends' of RetrofitWorks. There are no entry requirements to join. At the centre, the cooperative RetrofitWorks itself serves as the integrator of all these stakeholders and enables the link with the homeowners. The cooperative governance model means those delivering and receiving retrofit services have a say in how the scheme operates, fostering buy-in and collaboration.

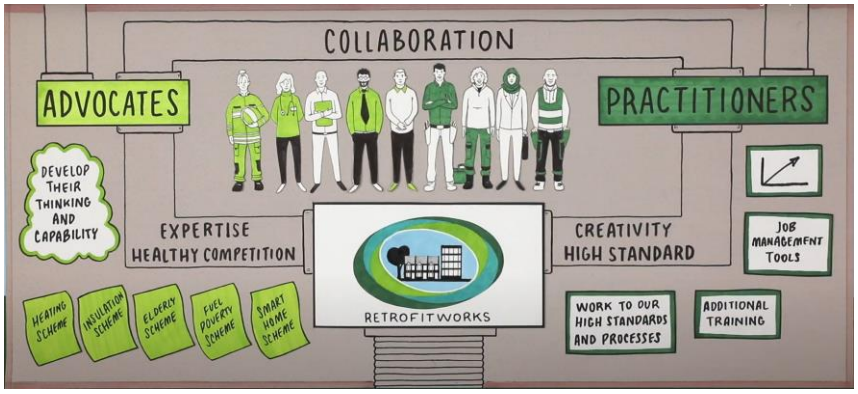

Figure 10 : Stakeholders mapping Retrofitworks

8.3.3 Results and impacts on partner enterprises

The impact on partner companies has been positive: they gain a reliable stream of work, higher profile and credibility, support in delivering quality retrofits, and input into decision-making.

- ✓ **Access to the market for local SME and micro enterprises.** By pooling demand and acting as a one-stop retrofit hub, the cooperative helps small local contractors access more retrofit projects than they could on their own, thereby increasing their revenue and workload. The cooperative matches homeowners and funding programs with "local, quality assured SME assessors and installers," ensuring that local firms get the work instead of large outside corporations (JRC, 2021).

  In practical terms, RetrofitWorks has already channelled a significant volume of work to its members, which might otherwise struggle to find customers in the fragmented retrofit market. RetrofitWorks provides its practitioners with pre-qualified leads and exclusive project opportunities, matching each contractor's expertise to clients' needs and lowering the marketing and customer acquisition costs for SMEs.

  Moreover, RetrofitWorks fosters a collaborative network among the SMEs. Rather than seeing each other purely as competitors, member contractors, energy assessors and designers meet through events or projects. This networking can lead to skill-sharing and subcontracting relationships, enabling small enterprises to take on comprehensive retrofits that require multiple trades.

- ✓ **Credibility through quality standards and quality assurance.** Partner companies further benefit from the credibility conferred by the cooperative. RetrofitWorks is a TrustMark[32] accredited scheme

[31] Federation of Master Builders (FMB), National Federation of Builders (NFB), Federation of Small Businesses (FSB), the Electrical Contractors' Association (ECA), the Royal Institute of British Architects (RIBA), etc.

[32] TrustMark is the only UK Government-Endorsed Quality Scheme for work carried out in or around the home.

provider enabling small firm to gain an enhanced reputation, collective marketing and visibility (Anon., 2025) – which helps in winning customer trust and additional contracts. Additionally, by embedding Retrofit Coordinators and quality assurance in every project, the co-op reduces the risk of call-backs or defects for contractors, which can save them money and bolster their reputation.

- ✓ **Training and development opportunities.** Members have reported improvements in their operations thanks to RetrofitWorks' support. For instance, one practitioner testimonial states that "Working with [RetrofitWorks' scheme] has greatly improved our business's processing efficiency. [RetrofitWorks'] expertise has streamlined our operations, reduced costs, and allowed us to focus on delivering better results to our customers." (Anon., 2025). This illustrates how the cooperative's coordination platform and guidance can help small firms operate more professionally and efficiently. Moreover, members have access to **Continuous Professional Development (CPD**) opportunities through the cooperative. For instance, Lime Green (insulation system supplier) provided training sessions for contractors on using eco-friendly insulation systems (Lime Green, 2021).

- ✓ **Collaborative model of governance.** Finally, RetrofitWorks gives partner enterprises a voice in governance and strategy. Member companies can vote on decisions and have a say in how retrofit schemes are run, ensuring the model works for those on the ground. This empowerment is rarely available when small contractors work under large corporate-led schemes.

RetrofitWorks projects also exposed a supply-side bottleneck. During the 2019–2021 Cosy Homes Oxfordshire pilot, homeowner demand proved strong. In just two years, over 550 households registered interest, far exceeding expectations. This validates that with proper outreach and a trusted service; the public will step forward for whole-home retrofits. However, the pilot also revealed a supply-side bottleneck: many projects could not quickly progress to on-site work because **skilled contractors were in short supply or already busy**. The program had to institute waitlists and temper its marketing due to this capacity constraint. This evidence highlights that the construction workforce "readiness" is a limiting factor, requiring as much attention as homeowner interest. (Low Carbon Hub, 2021).

8.3.4 Key learnings

RetrofitWorks shows that massification of renovations requires integrating local contractors, trusted advice, and consistent quality under a shared platform.

- **Collaboration is key to scale and OSS could drive the market.** Partnerships with councils and communities build trust and reach while construction companies' collaboration helps align incentives, maintain standards, implement trainings, ensure market access. Homeowners are more likely to act when advice comes from a familiar, mission-driven source rather than cold calls or national ads.

- **OSS can ensure market access to SMEs and micro enterprises, work quality and security and administrative support.** Through collaboration and integrated service systems, companies can gain a reliable stream of work, higher profile and credibility, support in delivering quality retrofits, and input into decision-making. Its centralised procurement system helps reduce administrative burdens for its members (local contractors) by streamlining how they can access and bid for contracts.

- **Demand exists if services are clear and credible.** The pilot experience showed that when offered a reliable one-stop service, homeowners are quite open to comprehensive retrofits – more than initial market research suggested.

- **Whole-house approaches are preferred and financially viable.** Given the right support (clear info, coordination, trust), people will invest in deep energy renovations, not just quick fixes.

- **Supply chain constraints are the biggest bottleneck.** The capacity of the supply chain remains a limiting factor – even as RetrofitWorks trained and added contractors, demand can still exceed supply in active areas.

9 Appendices

9.1 Appendix 1 – Detailed comments on the different renovation contribution to the construction sector's growth across Europe.

Top-left quadrant – C1: Countries where renovation will not be just a component of construction growth, but the main force preventing the sector from deeper contraction. This cluster includes countries such as France, Germany, Austria, Slovakia, and Portugal, which show either low or negative overall residential construction growth, but renovation makes up an overwhelming share - often above 90% - of the activity in the sector. This indicates that in these markets, renovation is not just a component of construction growth, but the main force preventing the sector from deeper contraction. In essence, renovation is pulling the market forward, compensating for sluggish or declining new construction activity. For example, in France and Germany, total construction growth is flat or even negative, yet the sector remains active largely because of extensive renovation projects.

Upper-right quadrant – C2 : Countries - Hungary and Sweden (upper-right quadrant – P2) – for which both residential construction and renovation activity are robust. These countries enjoy high overall construction growth, with a significant share driven by renovation.

Bottom-right quadrant – C4 : Countries - Ireland, Spain, Poland, the Czech Republic, and the UK (P4) – where the market experiences a substantial growth but is (still) primarily driven by new construction, with a relatively modest contribution of renovation (generally below 50%). While this growth is certainly positive, it also hints at a missed opportunity: with more strategic support for renovation, these countries could build a more balanced and potentially more sustainable construction sector.

Lower-left quadrant – C3 : Countries - Denmark, Finland, Switzerland, and Norway – where renovation has not yet been effectively leveraged to stimulate the market. These countries show relatively modest overall construction growth, and growth tends to be driven more by new construction than by renovation. This suggests that renovation has not yet been effectively leveraged to stimulate the market. In this context, renovation appears underutilized as a policy lever or market force, and increasing its share could be a path toward greater sector vitality.

Finally, Italy stands apart in the bottom-left corner showing both negative residential construction growth and an extremely low share of renovation. This represents a critical case where neither new building nor renovation is supporting the sector. Italy's position on the chart highlights a particularly vulnerable construction market—one that lacks both the dynamism of new developments and the stabilising influence of renovation. It underscores the urgency for structural reforms or incentives to reinvigorate the sector.

9.2 Appendix 2 – Detailed impact of market drivers on construction jobs

Table 2 - Impact scores of the market drivers on jobs. Based on (Observatoire des métiers du BTP, 2021) and CLIMACT analysis

	Market drivers	Score	Energy performance	Clean HVAC	Circular economy	Biomaterials	Industrialisation (off-site)	Digital transition	New modes of collab.	
NACE	**Vocations**									**Comments**
41.20	Construction of residential and non-residential buildings	13	2	2	2	1	2	2	2	The general contracting profession is likely to be heavily impacted by all market drivers, which will mean fundamental changes in design, site management and other areas to be coordinated.
43.11	Demolition	8	0	0	2	2	1	1	2	Building demolition activities could be transformed into deconstruction, due to circular economy (which involves intensive collaboration with other players) and a change in the type of materials used. The industrialisation of prefabricated products would mean completely different deconstruction activities.
43.12	Site preparation	4	0	0	1	0	0	2	1	Few data are available on this type of business, when it comes to transition. However, it is unlikely that site preparation will be fundamentally altered, except by the integration of digital tools (BIM, connected construction sites, etc.).
43.13	Test drilling and boring	1	0	0	0	0	0	0	1	Few data are available on this type of business, when it comes to transition. As a precaution, it is assumed that new modes of collaboration may have a slight impact on drilling and boring test activities.
43.21	Electrical installation	7	2	2	1	0	0	1	1	Increasing demands for energy performance and the installation of clean HVAC are leading to a number of changes, including (but not limited to) the installation of smart electricity meters, photovoltaic equipment and self-consumption management systems. The digital transition is also likely to have an impact on the sector, affecting pre-cabling activities, home automation installation, etc.
43.22	Plumbing, heat and air conditioning installation	8	2	2	0	0	1	2	1	Due to performance and clean HVAC requirements, the scope of intervention and technical knowledge of renewable energy systems and home automation systems will have to be extended, and maintenance activity should develop. The use of digital tools to search for and transmit information on the site will continue to spread.
43.29	Other construction installation	6	2	1	1	1	0	0	1	The increase in energy performance requirements has a particular impact on solutions and processes for insulating the building envelope. Materials and their supplies, as well as processes, will have to be modified if reuse and bio-based materials are developping. More intensive collaboration to integrate ducts and other HVAC installations will be required.
43.31	Plastering	3	2	0	0	0	0	0	1	The plasterer professions would involve greater skills (incorporating thermal insulation into walls and sometimes thermo-acoustic insulation) and more routine work on the overall insulation of buildings (involving greater collaboration).
43.32	Joinery installation	5	2	0	0	0	1	1	1	Trades like joiners and fitters will need to develop their skills in attic fitting, window installation, and technical understanding of thermal and acoustic challenges (which require the integration of the external envelope into their activities). The development of prefabrication will require knowledge of lifting and connection operations.
43.33	Floor and wall covering	5	0	1	1	1	1	0	1	The impact is primarily logistical, in terms of integrating new processes for activities upstream and downstream of covering, in terms of interactions with HVAC trades and prefabrication. The re-use and the use of bio-sourced materials also have a logistical impact on this type of business, which will need to develop resource management skills.
43.34	Painting and glazing	3	1	0	0	1	0	0	1	The glazing business needs to incorporate energy performance requirements, in particular. Painting activities could be modified in terms of materials and processes, as part of the development of bio-sourced materials.
43.39	Other building completion and finishing	1	0	0	0	0	0	0	1	Few data are available on this type of trade when it comes to transition. However, it is unlikely that finishing work will be fundamentally altered, apart from increased collaboration with other trades.
43.91	Roofing activities	7	2	1	1	0	1	1	1	Skills related to roofing activities will need to incorporate the growth in activities relating to the installation of solar equipment and insulation (energy performance). Reuse will have an impact on analysis and advice on the processes and materials to be used. Prefabrication and digital tools will lead to new skills in lifting, assembly and connection, and digital design.
43.99	Other specialised construction activities n.e.c.	8	2	2	0	1	1	1	1	For masonry activities, techniques and materials would be modified due to more complex and increased work (insulation). More eco-responsible materials would mean more varied and technical operations. As for waterproofing activities, they are becoming strategic, requiring a great deal of collaboration and techniques and materials to follow on from high-performance HVAC installations.
	Market drivers' score		17	11	9	7	8	11	16	

- “Construction of residential and non-residential buildings” (41.20) includes trades linked to general construction of residential buildings, general construction of office buildings and general construction of other non-residential buildings.
- “Other construction installation” (43.29) includes trades linked to insulation work and other installation work
- “Other specialised construction activities” (43.99) include waterproofing walls, restoration of facades, masonry and pointing work, building restoration work, etc.

9.3 Appendix 3 - Number of countries that identified a specific occupation as in shortage *(source: EURES, 2023)*

Figure 11: Shortage in terms of number of countries that identified the occupation as shortage. Source: *(EURES, 2023)*

NACE	Vocations	Occupation and number of EU27 countries that identified the occupation as shortage
41.20	Construction of residential and non-residential buildings	Building construction labourers : 11 Building frame and related trade workers not elsewhere classified : 5 House builders : 5
43.11	Demolition	
43.12	Site preparation	
43.13	Test drilling and boring	Well drillers and borers and related workers : 1
43.21	Electrical installation	Electrical mechanics and fitters : 12 Electrical line installers and repairers : 8 Electrical and electronic equipment assemblers : 8
43.22	Plumbing, heat and air conditioning installation	Plumbers and pipe filters : 19
43.29	Other construction installation	Insulation workers : 9
43.31	Plastering	Plasterers : 10
43.32	Joinery installation	Carpenters and joiners : 13
43.33	Floor and wall covering	Floor layers and tile setters : 10 Upholsterers and related workers : 3
43.34	Painting and glazing	Spray painters and vanishers : 10 Glaziers : 4 Painters and related workers : 10
43.39	Other building completion and finishing	
43.91	Roofing activities	Roofers : 11 Carpenters and joiners : 13
43.99	Other specialised construction activities n.e.c.	Concrete placers, concrete finishers and related workers : 11

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