THE PREFABRICATED CONSTRUCTION MARKET

OCTOBER 2025

MARKET TRENDS REPORT

ANALYSING KEY TRENDS FOR INFORMED DECISION-MAKING

LUXINNOVATION
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Introduction

The current economic, environmental, and geopolitical context has highlighted our construction ecosystems. Similar to other sectors, the increasing pressure on resources, labor shortages, and the demand for quicker, more sustainable building solutions are anticipated to have significant long-term impacts on the construction industry. Traditionally dependent on established players and fragmented supply chains, the sector also faces challenges from evolving regulations and environmental standards that profoundly affect the deployment of innovation.

Many of these challenges are amplified by the shift towards industrialisation, digitalisation, and the increasing role of automation and off-site manufacturing. While the traditional construction model is under strain, new opportunities are also emerging.
The objective of this report is to identify the main market trends linked to the rise of prefabricated construction and to understand how these trends are reshaping the construction ecosystems of tomorrow.

Recent developments have accelerated existing dynamics (e.g. modular construction), while new technologies are gaining ground (e.g. 3D printing, smart prefabricated components, etc.). These trends are expected to drive transformation strategies, eventually redefining the foundations of the construction industry.

In Luxembourg, where the construction sector represented approximately 6% of the national GDP in 2021 and where housing demand remains a major socio-economic challenge, these emerging trends are particularly relevant. They offer new perspectives for addressing structural issues such as labor shortages, environmental regulations, and the urgent need for sustainable housing.

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Prefabricated Construction **at a glance**

This infographic brings together key takeaways from the report to create a visual summary of key innovations, market trends, key players and innovative startups, as well as Luxembourg's role in the evolving prefabricated construction landscape.

109.30B€

will be the expected size of the European prefabricated construction market in 2030, compared to 78B€ in 2025 ([Mordor Intelligence])

CAGR of 7%

Expected compound annual growth rate (CAGR) of Europe's prefabricated construction market, 2025-2030 ([Mordor Intelligence])

#5 524

Companies operate within the prefabricated construction sector in Europe, out of a global total of 13,266, making Europe the region with the most companies in this sector.

84.04M€

Invested in 108 European startups with a peak at 9.16M€ in 2024.

Prefabricated construction added value compared to traditional construction

20-50%
Construction time reduction

20%
CO_2 emission reduction

8%-10%
Profit margins

Market Drivers

Digitalisation

Accelerates the adoption of prefabrication by

- Integrating robotisation, BIM* & IoT
- Shortening timelines
- Improving quality due to increased precision thanks to automation

Sustainability

Allows alignment with EU's environmental objectives by

- Boosting energy efficiency
- Creating less waste
- Optimizing ressources

Urbanisation

Answers the need for urgent housing demand by

- Delivering fast
- Lowering costs
- Standardising constructions

OPPORTUNITIES

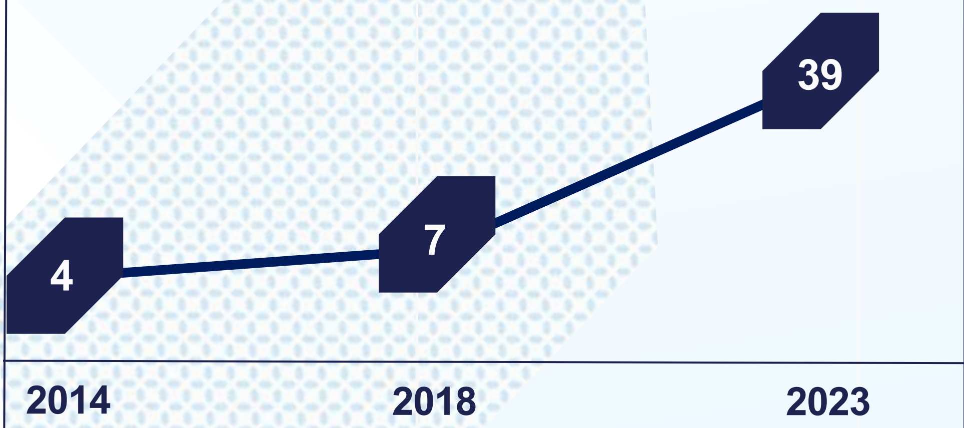
- Collaboration opportunities between construction actors and technology providers to create smart prefabricated construction modules.
- New digital technologies create new opportunities to address the manufacturing of prefabricated elements, thanks to robotisation, AI or 3D printing.
- Tax incentives, subsidies, research & innovation funding are currently deployed in Europe to foster the development and adoption of prefabricated construction. [Approximately 27%] of all new constructions planned in Europe for 2025 will be prefabricated, a figure that is expected to reach 35% by 2030.

CHALLENGES

- The prefabricated construction requires new skills, especially new digital skills, while the market is currently facing skilled labor shortages.
- The initial investment required for prefabrication technologies and off-site manufacturing remains high.
- Construction standards and urban planning rules differ from one country to another, making it difficult to harmonise standardised modules.

*BIM : Building Information Modeling

Deal count in European startups peaked in 2023



European startups key metrics

According to Pitchbook, 2D/3D construction technologies used to design prefabricated and modular components lead with the highest capital investment and deal count, followed by Artificial Intelligence and Machine Learning used to create prefabricated components, while clean technology signals future potential for prefabricated construction practices.

113
StartUps in Europe in prefabricated construction.

159
investors in prefabricated construction startups

83.92M€
capital invested in total

2025
saw a peak investment with a capital raised of 13.10M€

5 key innovative solutions to watch

Automation of prefabricated components
- Faster build times
- 50-70% cost reduction
- Less material waste

Digital twins for prefabricated infrastructure
- Real-time monitoring
- Design optimisation
- Energy simulation

Smart manufacturing with IoT
- Predictive maintenance
- Downtime reduction
- Automation of prefabricated component construction

High-performance refabricated materials
- +50% time saved
- Better insulation
- Recyclable components

Energy-efficient designs
- Lower energy bills
- RE2025 compliant
- Up to 30% emissions reduction

Luxembourg focus

50
modular housing units are planned for construction in Luxembourg City, with the intention to expand this number in the future, according to Forbes.

672 100
residents in early 2024 (+1.5%), representing an increase of 11,241 residents compared to 2023 highlight the need for faster, more affordable housing solutions—making prefabrication a key strategy to meet this demand, especially in view of long-term scenarios where the population could reach 759,000 by 2030 and up to 1,007,000 by 2050.

January 1, 2025
marks the enforcement of stricter material reuse regulations under Luxembourg's revised Waste Law, supporting sustainable prefabrication practices.

Market Definition

Prefabrication involves manufacturing construction components or modules off-site in a controlled environment, such as a factory, before transporting them to the construction site for assembly. This method differs from traditional construction, where most elements are built on-site. Prefabrication improves efficiency, reduces costs, enhances quality control, and minimizes site disruptions

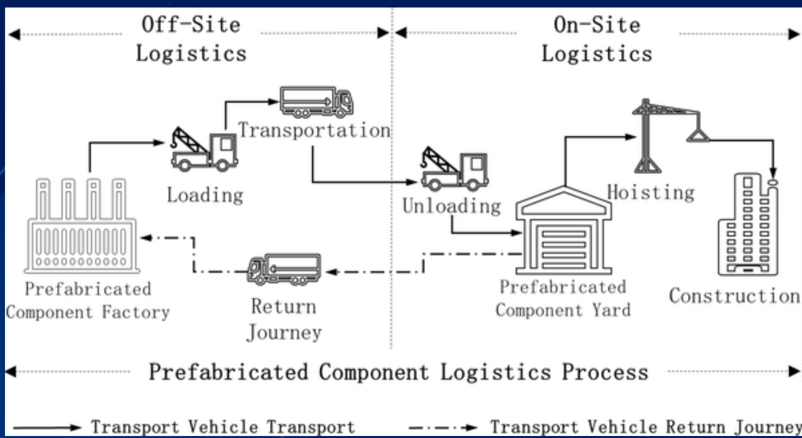
Prefabrication is versatile and widely used across various construction sectors:

New buildings: Homes, offices, and factories

Renovations: Modernizing existing structures

Infrastructure: Bridges, tunnels, and railways

Temporary structures: Quick-assembly buildings for emergencies or events



Explanation of Offsite and Onsite Prefabricated Construction

Prefabricated construction sectors

Residential sector leadership

The residential sector dominates the European prefabricated building market, holding approximately **40% market share in 2024** according to Mordor Intelligence. This dominance is driven by its role in social housing and sustainable building initiatives.

Commercial sector: emerging growth

The commercial sector is emerging as the fastest growing in the European prefabricated construction industry, with a **projected growth rate of approximately 7% during 2024-2029** according to Mordor Intelligence. This growth is primarily driven by the increasing adoption of modular building methods in office buildings, retail spaces, and hospitality sectors.

Other key applications

Other applications in the prefabricated buildings market, including **industrial, institutional, and infrastructure projects**, play a vital role in shaping the overall market landscape according to Mordor Intelligence.

Market Definition

Prefabricated Construction materials

Concrete and timber are the two most used materials when it comes to prefabrication. Steel and hybrid materials (i.e., combinations of different materials to optimise performance and efficiency) are also used to build specific prefabricated elements.

Timber

Timber is widely used in prefabricated construction, particularly for residential projects. Timber prefabrication is growing rapidly, with CLT* production in the DACH region (Germany, Austria, Switzerland), Czech Republic, and Italy exceeding 750,000 m3 and increasing by over 10% annually according to a study by Mordor Intelligence. It is used in:

- Structural framing: Wall panels, floor systems, and roof trusses
- Cross-laminated timber (CLT) panels for walls, floors, and roofs
- Engineered wood products like glulam beams for larger spans
- Exterior cladding and interior finishes

Steel

Steel prefabrication offers **high durability, design flexibility, and rapid assembly**, making it ideal for large-scale industrial and commercial projects in prefabricated construction according to a study by escglobalgroup. Steel accounts for a significant share, estimated between 20 and 30% depending on the application according to Mordor Intelligence. It is used in:

- Structural frameworks for industrial buildings and warehouses
- Modular units for commercial and residential projects
- Roofing and wall panels
- Connection systems and reinforcements

Concrete

Prefabricated concrete elements account for the majority of the European market. According to the Fédération de l'Industrie du Béton (FIB), prefabricated concrete wall elements alone represent 4.1% of the total volume of concrete products in France. Technical documents confirm concrete's leading position in panel and frame systems:

- Precast wall panels and floor slabs
- Foundation systems
- Structural columns and beams
- Modular bathroom and kitchen units

*CLT: Cross Laminated Timber

Market Trends & Drivers

Prefabrication provides numerous benefits over traditional construction methods, enhancing efficiency, reducing costs, and improving sustainability in the construction industry.

What does prefabricated construction have to offer compared to traditional construction ?

20-50% **reduction in construction time** can be achieved through prefabrication, minimising disruption and generating energy and costs savings, according to BPIE (Building Performance Institute Europe).

20% **reduction in CO_2 emissions** is achieved on average with modular construction according to a study from nature.com.

8-10% **higher average profit margins** thanks to reduced labour requirements. Prefabrication minimises labour expenses and mitigates unforeseen site-related costs. A McKinsey Company study reports **cost savings of up to 20%** compared to conventional construction methods, although competitive pressures may impact these margins.

How are these advantages achieved ?

- By enabling concurrent processes, components can be manufactured in a factory while site preparation is underway — a parallel approach that can reduce project durations by up to 50% according to BPIE (Building Performance Institute Europe)
- Factory-controlled environments eliminate common on-site delays such as weather disruptions, ensuring that high-quality components are ready exactly when needed.
- The modular design of prefabricated elements also facilitates rapid on-site assembly, minimising complexity.

- The shortened project timelines and decreased on-site activity translate to reduced energy consumption and fewer transportation-related emissions.
- Factory precision minimises material overuse and waste, directly reducing the carbon footprint of construction materials.
- The shift from on-site to off-site work also leads to less heavy machinery usage and lower emissions from temporary infrastructure, contributing to cleaner and more efficient building processes overall

- The reduction in construction time directly lowers labor-related expenses and accelerates time-to-revenue.
- With less reliance on skilled on-site labor, personnel costs and associated overheads are reduced.
- Factory-based production also minimises material waste, leading to significant savings on raw materials.
- The higher precision and quality control achieved in a manufacturing setting lowers the risk of defects and costly rework.
- Finally, the standardisation of components allows for economies of scale, decreasing unit costs as production volumes increase.

Market Trends & Drivers

Market Drivers

Digitalisation

The integration of technologies such as 3D printing, Building Information Modeling (BIM), and the Internet of Things (IoT) is revolutionising prefabrication processes. BIM, in particular, enables construction teams to visualize, simulate, and optimise building designs prior to fabrication, ensuring smoother workflows and superior outcomes. Additionally, automation and robotics have significantly increased precision and reduced errors in the manufacturing of prefabricated components.

Despite these advancements, digitalisation within the prefabrication sector remains inconsistent. According to Deloitte, over 40% of major construction companies in Europe are investing in production digitalisation in 2021. However, the sector still requires industry-wide standards and platforms to fully integrate digital tools across the supply chain. The adoption of AI-powered tools is also pushing the boundaries of efficiency, enabling automated processes such as cost estimation and material tracking.

Sustainability

Prefabrication enhances energy efficiency, reduces reliance on foreign materials, and lowers CO_2 emissions. It generates less waste, around 50% less with concrete use for example, optimises resource usage, and aligns with EU environmental objectives.
For example, according to Premier Modular, Modular construction can generate up to 45% less emissions than conventional practices. Prefabricated units align with circular economy principles, allowing for disassembly and repurposing at the end of their lifecycle. Modular structures are frequently constructed from infinitely recyclable materials, such as steel and FSC-certified wood, thereby minimising environmental impact and promoting resource reuse, as highlighted by Immodurable.

By leveraging controlled manufacturing environments, recyclable materials, and energy-efficient practices, the industry can significantly reduce its ecological footprint and support circular economy principles.

Urbanisation

The growing housing shortage in several European regions is driving municipalities to adopt faster and more cost-effective construction solutions like prefabrication.
In Germany, the GDW* estimates that the annual need for new housing is 320,000 units.

Modular construction offers scalable solutions for addressing urban housing challenges while maximising limited space. According to Eurostat (April 20, 2021), approximately 30% of new housing in major European cities already incorporates prefabricated components.

Prefabrication is emerging as a vital solution to the housing shortage in European urban centers. By offering scalable, affordable, and high-quality construction options, it addresses the pressing need for new housing while supporting sustainability objectives.

*GDW (Bundesverband deutscher Wohnungs- und Immobilienunternehmen)

5 Key Innovative Solutions to Watch in Prefabricated Construction

1

3D printing of prefabricated components

3D printing transforms construction by creating complex, customised structures layer by layer, reducing material waste and environmental impact. Large-scale 3D printers build entire structures in days, cutting construction time. **Projects like Dubai's 3D-printed office show 50-70% cost savings** and reduced labor needs, while AI integration enhances design precision and adaptability.

2

Digital twins for infrastructure

Digital twin technology optimises prefabricated module design and manufacturing, providing real-time monitoring, clash detection, and predictive analytics to improve precision and reduce risks. **Digital twins enhance energy efficiency by simulating building performance** under different conditions and improve stakeholder coordination with a shared virtual model for better decision-making.

3

Smart manufacturing with IoT

IoT technologies in smart manufacturing connect machines, sensors, and devices for real-time monitoring and predictive maintenance, optimising operational efficiency and minimising downtime in prefabricated construction. IoT systems ensure consistent quality by monitoring production parameters in real time, while predictive analytics **reduce equipment failures, saving costs on repairs and delays.**

4

High-performance prefabricated materials

Innovative materials for energy-efficient applications, like thermal insulation panels and lightweight structural components, enhance durability and reduce environmental impact. **Prefabricated concrete panels reduce construction time by up to 50%** while maintaining high quality, and hybrid materials combining wood and concrete, such as those used in Bordeaux's Hypérion Tower, improve insulation and structural performance.

5

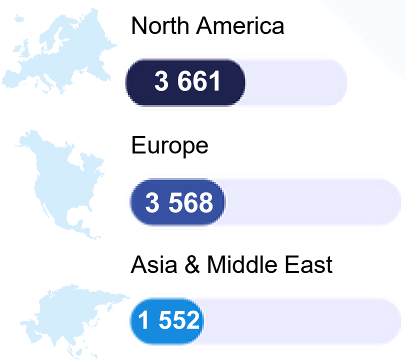
Energy-efficient designs

Energy efficiency is central to prefabrication innovation, featuring advanced insulation, optimised layouts, and renewable energy integration like solar panels. Prefabricated modules meet strict environmental standards such as RT 2020 and RE 2020. Projects like the Grand Paris Express, which use prefabricated concrete, show how **energy-efficient prefabrication can reduce emissions by up to 30%**.

Market Trends & Drivers

North America is currently leading the prefabricated construction sector, closely followed by Europe.The related startup ecosystem is experiencing robust growth, underpinned by increasing investor interest and technological advancements. The sector's focus on cutting-edge solutions such as 2D/3D technologies and construction tech highlights its potential to revolutionise traditional building methods. With sustained investment momentum, this space is poised for continued expansion and innovation.

Company count breakdown by geography in prefabricated construction



Source :This data is sourced from PitchBook database, where companies were filtered using the keywords "prefabricated building," "prefabricated housing," "prefabricated construction ," "modular construction," and the verticals "3D printing" and "construction technology," as of November 10, 2025.

European Prefabricated Buildings Market Growth Rate (Billion €)

Source : Mordor Intelligence

The European prefabrication market is expected to experience a compound annual growth rate (CAGR) of 7% between 2025 and 2030.

Spotlight on the UK: off-site construction case study

The United Kingdom exemplifies the rising demand for prefabricated construction, driven by urbanisation, innovation, and government initiatives. In 2023, **84.64%** of the population lived in urban areas, increasing the need for efficient housing solutions.
Prefabrication offers quick construction timelines and affordable options.

The sector includes **571 active companies**, with **17 startups** specialising in modular construction and advanced technologies.

Backing this shift Innovate UK, the leading global investor in this category of companies, has funded 180 (as of: 17.03.2025) projects, including Totally Modular's STELLAR, IGNITE initiatives, and AUAR's timber housing project. These investments boost technological adoption and market competitiveness.

Source :This data is sourced from PitchBook, filtered using the keywords "prefabricated building," "prefabricated housing," "prefabricated construction", "modular construction," and the verticals "3D printing" and "construction technology," as of March 12, 2025. For the study of startups, same filters were applied along with the business status " Startup" as of March 12, 2025.

Market Trends & Drivers

Prefabricated construction as a key market for startups

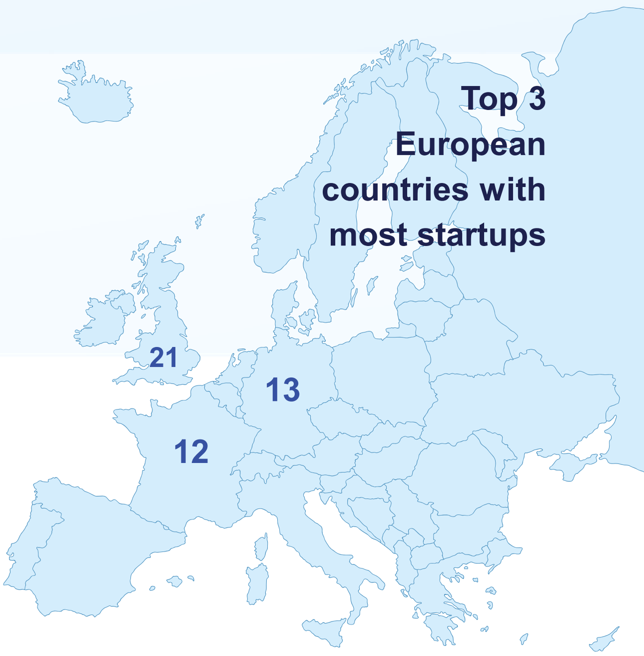
Startups in the prefabricated construction sector focus on innovative solutions such as eco-friendly prefabricated homes, green modular building elements, and affordable bioprinting technologies. They also develop 3D printing technologies for various applications, construction technology solutions, virtual and augmented reality applications, clean technologies, AI and machine learning, and SaaS solutions. The term “startup” in this report refers to companies classified as such by PitchBook based on internal criteria, including factors such as company age, funding stage, and private ownership status. This data is sourced from PitchBook, filtered using the keywords "prefabricated building," "prefabricated housing," "prefabricated construction," "modular construction," and the verticals "3D printing" and "construction technology," along with the business status “Startup” as of November 10, 2025.

113 Startups
in Europe are active in the prefabricated construction sector

159 investors
are funding prefabricated construction startups

83.92M€
capital invested in total In the European startups providing solutions to the prefabricated construction market

2025 saw a peak investment
with capital raised of 13.10M€



Investment activity has shown significant growth over the years. According to Pitchbook, the data highlights a steady rise in investment activity from 2020 onward, culminating in a peak in 2024, driven by heightened interest in construction technology and prefabrication innovations
According to Pitchbook the prefabricated construction sector exhibits a diverse distribution of capital across various industries.

Key insights include:

- 2D/3D printing dominate the landscape, attracting the highest total capital investment (65.86M€ invested) and deal count (77 deals). This reflects strong investor confidence in innovative design and modeling solutions for prefabrication.
- Artificial Intelligence and Machine Learning supporting operational efficiency and data security within construction processes is also a key area of investment (44.64M€ invested and 19 deals).
- Emerging areas such as Clean Energy Solutions and Autonomous Systems signal future potential for sustainable and automated construction practices.

Notably, the Construction Technology vertical which involves companies creating hardware and software to boost efficiency and productivity in construction, building, and infrastructure projects. stands out with a high deal count, emphasising its critical role in driving innovation and scalability within the prefabricated construction ecosystem.

Opportunities and Challenges in the prefabricated construction

Opportunities

The prefabricated construction sector is poised for significant growth, driven by government support, technological advancements, and strategic collaborations. With continued investment and innovation, the industry is well-positioned to meet future demands and sustainability goals.

Inter-company collaboration

Cross-sector partnerships are shaping the future of prefabricated construction, as inter-company collaboration becomes a key driver of innovation and efficiency.
This trend is illustrated by projects like the DFAB House in Switzerland, a **collaborative effort between ETH Zurich researchers, construction firms, and robotics companies**, demonstrating how architectural design, digital fabrication, and automated assembly can converge in a single initiative. Similarly, in the UK, the Seismic II platform, backed by Mott MacDonald, Bryden Wood, and the Construction Innovation Hub, **leverages digital twins and standardised components to streamline school prefabricated construction.**
These initiatives show how inter-company collaboration enhances knowledge transfer, accelerates product development, and fosters innovation across traditionally siloed industries. Platforms like BIM-based project management tools play a central role in facilitating real-time data exchange across actors in design, production, and installation.

New digital technologies

Digital technologies are reshaping prefabricated construction by **addressing workforce shortages through robotics and AI**. Companies now use 3D modeling for precision design, while autonomous robots handle tasks like material transport, welding, and layout planning, even in hasardous environments.
Projects like Boston Dynamics' Atlas illustrate this shift: originally a research robot, it is now tested for inspections, repairs, and handling heavy loads on-site (Boston Dynamics).
The European construction robotics market is expected to grow from **$305M in 2024 to $800M by 2030**, with strong public support from Horizon Europe and the European Innovation Council, which provide multimillion-euro grants. For example, the EIC's 2025 work programme allocates €120 million for emerging technologies including autonomous construction robots, and the EIC Pathfinder Challenges specifically target enabling autonomous robot collectives for complex construction tasks.
This evolution reflects rising demand and investor interest, as seen with firms like Gropyus (€140M raised) (Sifted), and highlights how inter-company collaboration—like the EU-funded BIMprove project—is **accelerating adoption of automation in construction**. The BIMprove project, funded under Horizon 2020, connects technology partners such as Robotnik Automation to develop **real-time digital twin solutions for construction processes, improving efficiency and safety on site**.

Political support and initiatives

European policy initiatives are accelerating the adoption of prefabricated construction by **promoting energy efficiency, low-carbon materials, and digital innovation.** The EU Green Deal and Fit for 55 package support industrial decarbonisation and encourage the shift toward modular and off-site solutions.
Several countries have introduced updated building codes and digital mandates. For instance, **France's RE2025** regulation promotes low-carbon materials in construction. **In Germany**, new national reforms aim to reduce bureaucracy and lower construction costs. The upcoming **Building Type E Act** allows simplified standards for residential buildings, potentially cutting costs by 10%, while a **new clause in the Federal Building Code** (§246e BauGB) streamlines approvals in high-demand areas.
Moreover, EU pilot programs in modular construction—such as those under the **Built4People** partnership—can receive subsidies, fostering innovation across both public and private actors.

Opportunities and Challenges in the prefabricated construction

Challenges

While prefabricated construction presents immense opportunities, the sector still faces several significant challenges that hinder its growth and widespread adoption. Addressing these challenges is crucial for unlocking the full potential of prefabricated construction.

Skilled labour shortages

The prefabrication industry is heavily reliant on a workforce skilled in advanced technologies such as Building Information Modeling (BIM), Computer-Aided Design (CAD), robotics, and modular construction techniques. However, there is a growing gap between the demand for such skills and their availability in the labor market.
According to the OECD, **approximately 25% of specialised positions in construction digitalisation remain unfilled**, underscoring the severity of the skills gap.
A report by McKinsey found that at least 20% of the current skilled workers (470 000 people) should retire by 2030, with Europe being one of the most affected regions.

To address the growing skills gap in prefabricated construction, targeted training and apprenticeship reforms represent a scalable and high-impact solution. As an example, the UK government has recently committed £600 million to train up to 60,000 additional construction workers by 2029, including bricklayers, electricians, and engineers. This initiative encompasses the establishment of new Technical Excellence Colleges, expansion of Skills Bootcamps, and the provision of over 40,000 industry placements annually, supported by a £32 million contribution from the Construction Industry Training Board (CITB). These efforts aim to accelerate workforce upskilling and attract younger talent to the sector, which is crucial for sustaining the industry's transition to industrialised construction.

High initial costs

Prefabricated construction requires significant upfront capital investment in advanced machinery, robotics, software systems, and factory setups. These costs can be prohibitive, particularly for small and medium-sized enterprises (SMEs). A European Construction Market Report (2022) revealed that **35% of SMEs face difficulties securing financing for advanced technologies** like robotics and modular production systems.
The initial **setup cost for a prefabrication factory can range from €2 million to €10 million**, depending on scale and technology used.

To address the high initial costs of prefabricated construction, focusing on bulk purchasing, strategic partnerships, and specialized financing options can be effective. Bulk purchasing allows companies to benefit from economies of scale, as seen with ASR Materials, which secured lower prices and ensured a steady supply of materials. Strategic partnerships, like Husqvarna Construction's alliance with AABTools, optimise the supply chain and reduce overhead costs. Specialised financing solutions, such as development finance, bridging loans, and mezzanine finance, help manage upfront costs. LivFinance offers development finance covering land acquisition and construction costs, with flexible repayment terms aligned with project completion. These strategies make prefabricated construction more viable for SMEs.

Regulatory constraints

The fragmented regulatory landscape across countries—and even regions—creates significant hurdles for standardising prefabricated construction processes. This lack of harmonisation **increases costs and delays,** particularly for cross-border projects. The World Economic Forum (WEF) reported that harmonised building codes could enhance competition and productivity.

To address regulatory constraints, forming strategic partnerships, such as those between regulatory bodies and industry stakeholders, can streamline compliance processes and reduce regulatory barriers. For example, the International Code Council (ICC) and Modular Building Institute (MBI) created Standards 1200 and 1205 to simplify code implementation for off-site construction

Opportunities and Challenges in the prefabricated construction

Value chain & opportunities

Opportunities in the prefabricated construction arise all along the value chain, offering new markets for technologies and collaborations creating added value for construction players and technology companies. While production and logistics may generate high volumes/turnovers thanks to new technologies, conception & design, as well as maintenance & after-sales services generate higher revenues bringing added value to the value chain.

Design & Engineering

The Design & Engineering phase consists in the conception and planification of the future prefabricated construction elements, hence optimising the design processes, reduce prototyping costs, and deliver highly customised modular solutions.

Opportunities are mainly driven by an increasing demand for both **personalisation and standardisation of prefabricated modules**, made possible by advanced BIM, IoT integration within modular design, while digital twins, 3D printing allow reducing time-to-market as well as aligning with evolving clients expectations for personalisation. Businesses that invest in technical know-how and value-added design capabilities can command higher margins and stronger differentiation.

Automation and parametric design open new markets for software developers and engineering firms previously unengaged in prefabrication—for example, Dynamo scripts for Revit speed up customised module design. Likewise, **specialised engineering in innovative materials creates opportunities for consultants** to develop tailored prefabricated solutions, as demonstrated by the Monte Rosa Hut project, where prefabricated elements were engineered for extreme conditions, highlighting the value of this expertise.

Production & Automation

Production and automation are essential levers for scaling up operations and maximising profitability in modular construction, while improving quality and standardisation. Industrialised manufacturing processes—including robotic assembly lines and automated fabrication of components—significantly lower unit costs and support high-volume output (e.g. social housing, public infrastructure, etc.). Volume generation through automation increases production efficiency and enables the diversification of offerings to serve broader market segments. The shift toward advanced materials such as composites, lightweight alloys, and high-performance concrete further enhances the competitiveness of prefabrication.

Strategic opportunities include technological advancements such as robotic assembly, automated fabrication, or the use of advanced materials, although requiring high-investments costs to be integrated in off-site construction factories.

Production and automation open new markets by enabling high-volume, cost-efficient prefabricated construction. For instance, XtreeE uses robotic 3D printing with high-performance concrete to produce complex components with minimal waste. Meanwhile, Sekisui House operates automated modular factories in Japan, where robotic lines build housing units at scale, combining speed, quality, and customisation. **These examples highlight how tech integration boosts both competitiveness and collaboration in off-site construction.**

Opportunities and Challenges in the prefabricated construction

Value chain

Logistics & Distribution

Efficient **logistics and distribution** systems are critical enablers for scaling modular construction projects, particularly when operating across multiple geographies. Just-in-time (JIT) logistics, combined with digital tracking and coordination platforms, can dramatically improve productivity by reducing storage needs and synchronising on-site deliveries. The increasing harmonisation of construction standards across borders is also boosting demand for specialised transport of prefabricated elements.

Opportunities are offered by the integration of B2B platforms, logistics platforms, digital tracking including blockchain, and just-in-time logistics tools.

Urban logistics innovations like the EU-backed SUCCESS project are creating opportunities for logistics service providers and tech firms through the use of Construction Consolidation Centres (CCCs), which streamline urban deliveries of prefabricated elements, reducing traffic, costs, and environmental impact in dense city environments.

On-Site Assembly & Installation

Real-time monitoring and high-skilled workers allow accelerating the **on-site assembly process** while minimising potential errors.

Opportunities are linked to training high-skilled workers and in developing real-time monitoring tools to monitor the on-site assembly, ensuring smooth coordination between the off-site and on-site operations.

An example of on-site assembly innovation is the use of augmented reality (AR) to guide teams during the installation of prefabricated modules. For instance, the company XYZ Reality offers the HoloSite system, which **overlays 3D models directly on the construction site to ensure precise installation and reduce errors.** This technology creates new opportunities for AR/VR solution providers and companies specialising in digitalised assembly.

Maintenance and after-sales services

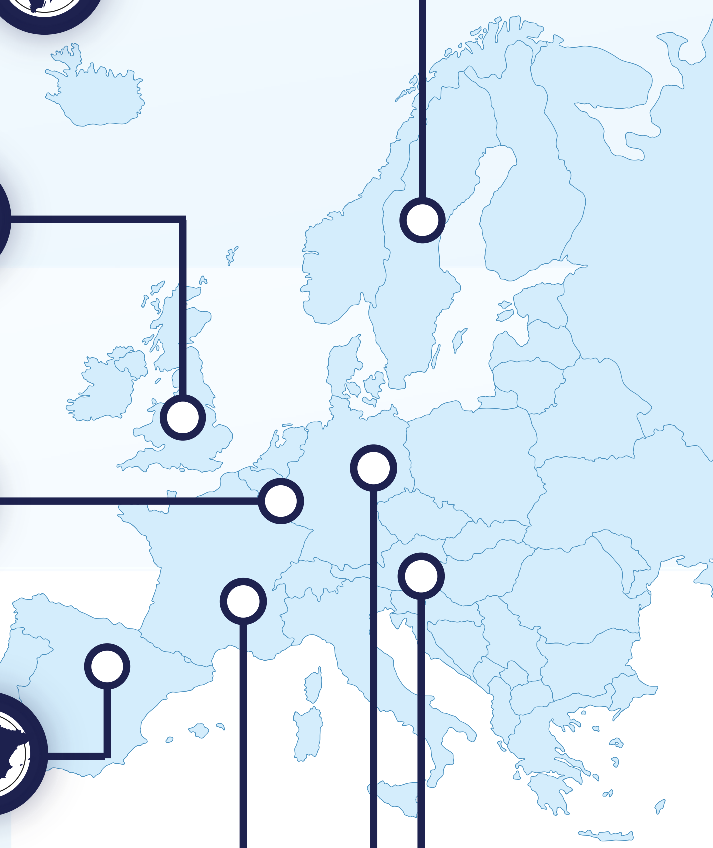
Maintenance and after-sales services represent a high-margin area that is increasingly strategic as the adoption of prefabricated buildings grows. With the integration of IoT sensors and predictive maintenance technologies, service providers can offer long-term value through proactive support and system upgrades, increasing customers satisfaction.

Opportunities mainly arise from IoT and predictive maintenance systems for modular buildings, to provide added value services all along the life cycle of the prefabricated elements. Assistance contractualisation systems and anticipation of renovation services offer high-margin opportunities, while increasing the customer retention. Companies that position themselves as lifecycle partners; offering monitoring, upgrades, and expansion options; can maximise margins while deepening client relationships.

Maintenance and aftersales services in prefabricated construction create **new markets for digital platforms and tech firms**. Tools like HUB DB SERVICE enable real-time tracking and predictive maintenance, while digital twins optimise building performance, offering opportunities for software, IoT, and maintenance providers.

Some Key Players

This section presents examples of key players in the field of prefabricated construction, showcasing how these companies innovate to enhance efficiency, sustainability, and quality in construction projects.



Sweden

Skanska AB, PEAB AB, Derome AB, Martinson Group AB, Lindbacks, Trivselhus AB, Gotenehus AB

United Kingdom

Sigmat, Laing O'Rourke, Barratt Developments PLC, Bellway Homes Limited, Berkley Group, Balfour Beatty Group Limited

Belgium

Wanty Group, Artes Group, Mathieu Gijbels

Spain

ALUCASA Mobile homes, COFITOR Prefabricated houses, Sismo Building Technology, Custom Home - Casas Modulares Huércal

France

Bouygues Construction, VINCI, Cougnaud Construction, Bodard construction, Bonhomme Bâtiment, MARC SA, OBM Construction

Germany

ALHO Systembau GmbH, Romakowski GmbH & Co. KG, MCE GmbH Niederlassung Rhein-Main, Deutsche Fertighaus Holding

Austria

Swietelsky AG, ELK Fertighaus GmbH, Wimberger Holding GmbH, Kieninger Gesellschaft, Georg Fessl

These companies were highlighted by Mordor Intelligence for their leveraging of advanced manufacturing techniques, digital tools, and sustainable practices to deliver high-quality, efficient, and eco-friendly construction solutions.

Key European projects to watch

Prefabrication is gaining traction as a key solution for sustainable construction in Europe. Within the **Greater Green+** project, it stands as one of the five main focus areas, alongside water, bioeconomy, green energy, and recycling. The **W.A.V.E.** project further strengthens this momentum: a survey conducted with around 20 companies in the wood and sustainable construction sectors revealed growing interest in 2D and 3D prefabricated modules. These projects reflect Luxembourg's active role in fostering innovative, low-carbon construction practices across borders.

GREATER GREEN+ Project: A Cross-Border Ecosystem to Accelerate the Ecological Transition and Economic Resilience through the Development of Greener Technologies

Funding: Interreg Greater Region 2021–2027
2024–2028
Coordinator: Grand E-Nov+
11 funding partners
Total cost: €6,544,532.40

"The GREATER GREEN+ project aims to position the Greater Region as a leading territory for the ecological transition, supporting the circular economy and sustainable development across five core areas: energy, sustainable construction and renovation, recycling technologies, water and environment, and the bioeconomy. Through its action programme (awareness events, workshops, networking, ideation and project acceleration groups, and an annual Green Tech event), GREATER GREEN+ acts as a true accelerator for cross-border cooperation and technology transfer in the field of Green Tech, promoting circular economy, resilience, and resource efficiency (critical raw materials, water, energy)."

W.A.V.E. Project: Wood Added Value Enabler

Funding: Interreg Greater Region 2021–2027
2023–2027
Coordinator: Luxinnovation GIE
29 partners
Total cost: €5,800,000

"The EU-funded W.A.V.E. project aims to strengthen the local timber industry in the Greater Region by enhancing the value chain through cross-border cooperation. The project focuses on increasing the use of local wood in construction, promoting innovation and digitalisation among SMEs, and supporting the development of sustainable wood-based construction practices. By fostering collaboration between stakeholders in France, Germany, Luxembourg, and Belgium, W.A.V.E. seeks to build a high-performance, eco-friendly timber sector that contributes to the circular economy and regional resilience."

Key European projects to watch

Examples of funded European projects

Through its European funding team, Luxinnovation can assist public and private organizations in identifying and applying for European calls, thus helping them seize emerging funding opportunities for their innovative projects. **Learn more about the European funding programmes covering prefabricated construction on page 22 and discover how Luxinnovation can support you in navigating them.**

FORTESIE Project: CBDC powered Smart PerFORrmance contracTs for Efficiency, Sustainable, Inclusive, Energy use

Funding: Horizon Europe (HE - CL5)
2022-2025
Coordinator: EUROPEAN DYNAMICS LUXEMBOURG SA
26 partners
Total cost:€ 9 562 850

"The EU-funded FORTESIE project will develop building renovation packages tailored to meet the needs of different target groups and optimised for improved energy performance, CO2 reduction and increased comfort levels. These renovation packages will combine state of the-art construction materials and technologies, including prefabricated facades, building-integrated photovoltaics and heat pumps. Overall, FORTESIE aims to accelerate the Renovation Wave in Europe and promote more sustainable practices in the building industry."

SUSBIND Project: Development and pilot production of SUStainable bio BINDer systems for wood-based panels from renewable resources

Funding: Horizon 2020 – Circular Bio-based Europe Joint Undertaking (CBE-JU)
2018–2023
Coordinator: RTDS Group (Austria)
11 partners
Total cost: € 5 480 220

"The EU-funded SUSBIND project aims to develop, produce and test bio-based binders as alternatives to fossil-based binders currently used in furniture mass products. By substituting fossil-based chemicals with those from renewable resources, SUSBIND seeks to reduce the carbon footprint of furniture products, decrease formaldehyde emissions by 50–75%, and enhance indoor air quality. The project focuses on creating binders suitable for particleboard (PB) and medium-density fibreboard (MDF), leveraging surplus feedstock from European biorefineries."

EB UV Project: Pre-painting Steel Coil Using Electron Beam Technology

Funding: Innovation Fund
2021–2023
Coordinator: ArcelorMittal Construction
1 partner
Total cost: € 4 000 000

"The EU-funded EB UV project has developed a first-of-its-kind full-scale process for curing paint on steel substrates without the use of natural gas. By replacing gas-fired ovens and solvent incinerators with electron beam and ultraviolet technologies, the project achieves up to 31% reduction in greenhouse gas emissions and significantly lowers VOC emissions. This innovation contributes to the EU Green Deal objectives by promoting more sustainable practices in the steel coating industry."

Prefabricated construction landscape in Luxembourg

Urbanisation and growing housing demand paving the way for prefabricated construction applications

Urbanisation and housing demand

By early 2024, Luxembourg's population was 672,100, driving high housing demand with 4,500 to 5,000 new homes needed annually. Prefabrication can help address this shortage with faster, cost-effective solutions. Projects like "**La Petite Maison**" highlight innovative approaches to sustainable housing, using salvaged materials and modular designs that can be dismantled and rebuilt elsewhere.

Trainings and learning programs

In 2024, the construction workforce dropped by 5.2% (STATEC). To counter this, Luxembourg's **IFSB offers over 850 courses to 8,000+ trainees,** including specialised modules focused on **prefabricated construction,** such as assembling timber buildings, installing prefabricated elements, and placing precast slabs and walls.

Digitalisation

Luxembourg is advancing digitalisation in construction through initiatives like the **CRTI-B's BIM strategy** and the InterReg NWE "Digital Deconstruction" project. This project uses AI and scanning to facilitate material reuse and reduce waste, with companies like BIM-Y scanning up to 12,000 m² daily to identify reusable resources. Digital DeConstruction enables the reuse of prefabricated elements from existing buildings in new projects, supporting circular construction and reducing environmental impact

Adoption of sustainable designs

Luxembourg has taken legislative steps to promote sustainable construction practices. Article 26 of the Waste Law (revised June 9, 2022) mandates stricter inventory requirements for building materials and redefines distinctions between waste and reusable construction materials starting January 1, 2025. This approach enables better planning for future projects by identifying available resources from deconstructed buildings and aims to encourage reuse, including of prefabricated elements, by requiring better traceability of materials.

Prefabricated construction landscape in Luxembourg

Innovative solutions made in Luxembourg

Luxembourg boasts a dynamic and forward-thinking prefabrication sector, with numerous companies at the forefront of sustainable and efficient building practices. Since 2022, Luxinnovation's "Mapping of Sustainability Enablers" has identified and classified over 426 companies driving the green transition through innovative technologies and solutions.
In the wood sector—particularly in timber construction; Luxinnovation has also mapped Luxembourg's "Wood mapping" shedding light on a vibrant network of 1,519 companies spanning the entire value chain.

Circular construction is rapidly gaining ground in the country, supported by groundbreaking projects that illustrate new paths toward sustainability. From Dellizoti's straw-insulated headquarters and LEKO LABS' carbon-negative timber systems to POLYGONE's modular, upcyclable housing and CDCL's hybrid, demountable buildings, these initiatives reflect a strong shift toward resource efficiency and circular design. Prefabrication, renewable materials, and adaptability lie at the heart of these efforts, helping to define a new standard for ecological construction in Luxembourg.

A deep dive into the industry: expert analysis

Today, the prefabricated market in Luxembourg remains marginal – perhaps around 1%, 2%, but in the long term, I think it could represent about 25% of the market, particularly in **affordable housing and office buildings.** However, the current economic indicators are not very favorable, and the regional context, especially the dependence on resources and energy, suggests a difficult future if we do not change our mindset.

- Régis Bigot, Innovation Project Manager at Neobuild GIE

Prefabricated construction landscape in Luxembourg

Some examples of prefabricated solutions in Luxembourg

Polygone

Polygone specialises in construction and civil engineering, offering modular and prefabricated solutions, as well as services in demolition, construction waste management, and exterior finishes. **Their project :** Bâtiment Modulaire d'Habitation Amovible (Removable Modular Housing Building). POLYGONE'S modular housing units are designed to be stackable, demountable, reusable, and upcyclable, reflecting their innovative approach to sustainable construction.

Prefalux

Prefalux, located in Junglinster, Luxembourg, stands out in the prefabrication sector by designing and manufacturing custom-made prefabricated wood elements in its own workshops, which are then assembled on site for projects ranging from single-family homes to large-scale public buildings.

CDCL (Compagnie De Construction Luxembourgeoise)

CDCL has developed a **hybrid, demountable, and reusable building** certified according to Cradle to Cradle criteria. This project, created with Alleva Enzio Architectes et Associés, uses a modular system of concrete and wood elements to enhance sustainability and adaptability. Prefabricated elements are assembled on-site, promoting circular economy principles and reducing environmental impact.

Delizotti

Their project : Circular Construction of New Headquarters

Dellizoti is focusing on circular construction for their new headquarters, integrating sustainable practices and energy-efficient designs. Their project include the first straw building in Bettembourg, showcasing their commitment to ecological construction. Prefabrication plays a key role in this approach, with façade elements manufactured off-site, significantly accelerating construction while supporting circularity and sustainability.

LEKO Labs

LEKO LABS specialises in carbon-negative construction, utilising AI optimisation and robotic manufacturing to produce modular and prefabricated building materials that replace traditional concrete and steel.

Their project : Carbon Negative construction at scale. LEKO LABS specialises in sustainable building systems, offering ecological and energy-efficient prefabricated solutions. Their RDI project supported by Luxinnovation's National Funding team, focuses on using renewable and recyclable materials, designing highly insulated and energy-efficient elements, and providing integrated design and construction services. Residential homes in Luxembourg using their timber-based system demonstrate their commitment to sustainability and energy efficiency.

Steffen HolzBau

Steffen Holzbau, based in Luxembourg, specialises in timber construction, offering sustainable and energy-efficient solutions, including prefabricated wooden houses, passive and plus-energy buildings, industrial halls, wooden bridges, and custom timber structures.

Key Research & Innovation Funding tools to take action

Interested in how luxinnovation can provide help on these European subjects ?

Contact our experts for further information and support.

Horizon Europe Programme

The EU's flagship programme for research and innovation (2021-2027) has a budget of €95.5 billion. It offers funding for the Sustainable Construction Sector through:

1. Horizon Europe Cluster 5 (HE CL5,CL6)
2. Circular Bio-based Joint Undertaking (CBE-JU)
3. The upcoming New European Bauhaus Facility

Innovation Fund Programme

The EU's largest funding programme for net-zero and innovative technologies (2020-2030) has a budget of €40 billion from the EU Emissions Trading System. It provides grants and auctions for projects focused on deploying innovative low-carbon technologies, including net-zero buildings.

FIT 4 Sustainability

Fit 4 Sustainability helps companies assess and reduce their environmental impact in order to decrease costs, improve their reputation and gain new clients who value a sustainable approach.

Sustainability study	SMEs & LEs	Co-financing of fees
Energy audit Carbon footprint Water footprint Life cycle analysis + ACTION PLAN by an expert referenced by Luxinnovation		70% 60% 50%

National funding

Companies applying for R&D and innovation funding from the Ministry of the Economy are welcome to contact Luxinnovation to get help with their applications.

Interested in how luxinnovation can provide help on Luxembourgish funding opportunities?

Contact our experts for further information and support.

Conclusion

Prefabrication is transforming construction, offering faster, greener, and more cost-efficient solutions. Across the globe, digital tools like BIM, AI, and modular design are driving innovation. However, fragmented processes, regulatory gaps, and low standardisation still hinder large-scale adoption.

In Luxembourg and Europe, the sector remains a niche but holds great potential. Startups, SMEs, and public initiatives are paving the way for more sustainable and efficient construction. Collaboration and standardisation will be key to unlocking this transformation.

Key Points

A rising global trend
Prefabrication accelerates construction while reducing costs and environmental impact.

Unlocking widespread adoption
Advancing standardisation and unifying digital workflows are key to broader implementation.

Innovation through collaboration
The sector's future lies in stronger partnerships, digital integration, and political support. Prefabrication is not just about building faster—it's about shaping a more sustainable future.

LUXINNOVATION MARKET TRENDS REPORT

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Luxinnovation Market Trends Contributors

Research & Writing & **design**: Samira Bouzid

Interview Contributions: Régis Bigot

Analysis Support: Caroline Holz, Charles-Albert Florentin, Emmanuelle Kipper, Avit Blanchy, Nancy Ramia, Benjamin Questier, Jean-Claude Backendorf

Editing & Review: Sara Bouchon

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