Industrialised construction and its digitalisation

A key investment for the builders of the future
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Industrialised construction: A key investment for builders of the future

Industrialised construction is still under development in Europe, but it is gaining ground in many technologically advanced economies due to the advantages and benefits it brings to both the construction sector and the end client. It is estimated that an industrialised construction project achieves a 60% reduction in CO2 emissions¹ during its execution with costs that are lower and delivery times that are shorter. With so many advantages, why is it still a niche option in most European countries? We review the current situation and analyse why this could change in the coming years.

For experts in the sector, industrialised construction is a clear path to sustainability². This modular building methodology reduces costs and time because a large part of the work is carried out on an industrial scale. Once a structure is available, it is transported for the assembly of the different components and modules. During assembly, several modules that have already been built are grouped together into a single unit, reducing the length of waiting time for customers as well as overall construction costs.

What is industrialised construction?

Industrialised construction is relatively new in most European countries, but it is gaining momentum in general due to its advantages. It is a more sustainable alternative to traditional construction, as it is based on a construction system that takes advantage of technological advances in the industry to produce the entire structure or modules in a factory in an automated way.

Complete modules are created in the factory and only when they are finished are they moved to the construction site, where they are joined together to create a unit. For example, a complete unit would be a bathroom, which is built in the factory and when it is built in a single module, it will be grouped with others such as the bedroom or kitchen.

Site processes are still present, but they are carried out in a factory in a mechanised and repetitive way, creating walls, floors or roofs in a more efficient and sustainable way. A commitment to innovation in which many companies have begun to invest, generating an ecosystem conducive to its growth in Europe, where it is still a niche option compared to other more traditional construction methods.

The sector is starting to go digital and more and more professionals are opting for construction methods that use technology for more efficient, cheaper and sustainable development of construction projects. It is still too early to know whether industrialisation will eventually become a construction standard, but what is clear is that conditions have never been so favourable for its development. It has direct advantages for the end client, it is interesting because of its lower environmental impact and it reduces costs in the sector, benefiting both the company and the client.
Benefits of industrialised construction over traditional construction

Many companies have begun to invest in innovation in the sector through industrialised construction, due to the advantages and benefits it offers compared to traditional construction. We review some of the benefits of industrialised construction:

• It meets today's environmental requirements and is more sustainable than traditional construction methods.

• The production of construction waste, one of the main environmental challenges for the sector, is significantly reduced. Many of the materials used in traditional construction sites are not easily recyclable, so their impact on the planet is a potential problem for all countries.

• It reduces the time spent on each project, which can mean a 40% reduction in construction time³. Offsite construction prevents weather conditions from being an inconvenience, as a large part of the construction is carried out in the factory.

• Less manpower is required for construction, as many factory processes are automated. In addition, working conditions are safer for workers, the environment is more controlled and it is easier to take preventive safety measures.

• Greater control over design and production, giving way to customisation of the final finish in a simple and convenient way for the company and the end customer.

• Production is better controlled, processes are automated and greater optimisation and control of time and expenditure is achieved.

• Further energy and water savings can be achieved, both in the construction process and in the subsequent assembly on site.

• It simplifies the maintenance of buildings, because if damage is caused, it can be repaired by dismantling the affected part and working only on that part.

• The quality of the materials and the final construction finish can be closely monitored.

All these advantages are useful for the end client and for the construction company, which is why it is common for more and more construction professionals and construction companies to invest in this method. This is one of the many factors why it is considered that the environment in Europe is ripe for this niche to start gaining ground in the sector.

It could also be of interest to local government, as by incorporating this system they can reduce costs, improve quality and shorten the time taken to develop public housing. This would benefit the most vulnerable groups in society. In addition, more economic resources would be available for other purposes and the waiting time for access to these dwellings would be reduced.

³https://www.sismospain.com/construccion-casas-industrializadas/
Risks and disadvantages of industrialised construction

Industrialised construction means a long-term cost reduction in terms of labour, energy, maintenance... It is estimated that industrialisation can reduce costs by 10-15% compared to traditional construction⁴. However, it has some disadvantages that make companies in the sector reconsider their decision to invest.

Disadvantages of industrialised construction:

- High fixed costs. Industrialisation requires higher investment in factories and specialised machinery.

- Standardisation and limitations in architectural design. Industrialised construction is leading the sector towards mass production of more uniform constructions. However, technologies such as 3D printing may favour more customised offerings.

- More volatile prices. Higher fixed costs and low variable costs can make prices more volatile. Industrialised construction companies may lower construction prices drastically in order to recover fixed costs.

⁴https://think.ing.com/articles/industrialisation-in-construction-weighing-up-lower-building-costs-against-higher-risks/
Types of industrialised construction

There is no single methodology or format within industrialised construction, but 4 main types can be distinguished today.

Lightweight construction

This type of construction uses galvanised steel profiles to create the walls and structures of buildings. It is appealing because of the speed of the process, and it also keeps waste and costs to a minimum.

Construction Concrete

A concrete structure, a strong material that can withstand high loads and tensile stresses is chosen. It generates more waste than the first type, because the concrete has to be prepared and laid.

Modular Construction

In this type of industrialised construction, the building is made in different blocks that are then joined together into a single unit. They can be made using galvanised steel or concrete.

Construction with other materials

There are other materials widely used for industrialised construction. On the one hand, wood, which allows for economical, fast and customisable construction. On the other hand, containers used for maritime transport are also used.

These are of less interest to many buyers or end-customers because of the thought that they will be of lower quality or have less durability over time, but in most cases better quality and results can be achieved than with traditional construction methods.
Staggered development in industrialised construction

Despite the fact that industrialisation in the architecture sector has clear benefits, the percentage of industrialised construction in some countries, such as Spain, does not reach even 1%, in other countries such as Germany or the United Kingdom, the percentage is higher, representing between 9% and 7%. These figures are still far behind when compared to the Netherlands, where this construction methodology is touching 50%.

Even with these low figures for industrialised construction in some countries, there are many experts who consider that there is a favourable environment for the development of this method. There are already several developers and industrialisation companies that are committed to the implementation of this system within the construction sector. This is combined with the fact that there are more and more architects interested in this method and its possibilities. These buildings are a commitment to sustainability, modernisation and construction quality.
Sustainability, a plus for industrialised construction

Regulations to mitigate the impact of industry and transport on the environment are becoming increasingly strict at the European level. Countries are betting on the development of economic activities that are work both for people and the planet, so it is not unreasonable to think that the construction companies or developers of the future will want to bet on a more energy efficient system that generates less waste and achieves the same or better results in less time than traditional construction companies.

100% of countries state that sustainability will be a major influence on building design.

Source: Architecture of the Future 2022 Report - PlanRadar

The recovery plan for Europe, in the fight against climate change, will play a prominent role in this transformation of the industry. It will focus on sustainable projects, which reduce CO2 emissions during construction which, in addition, will be combined with the optimisation of resources and materials to build more energy-efficient and less polluting homes.
Reduced construction costs, one of the most talked-about benefits

It is essential to take into account the reduction in material and time costs of industrialised construction. In Europe, the costs of raw materials and energy have risen sharply. This has caused production costs to rise and some developers have even had to stop projects because they cannot afford the high costs involved.

Highlighted phrase: Industrialisation can reduce construction costs by up to 15%.

Industrialised construction presents itself as an alternative to reduce these costs for several reasons. Firstly, fewer materials are required and these are worked more efficiently during construction. Secondly, less labour is required for the projects, lowering personnel costs for construction companies. Also related to personnel, we see that the need for construction professionals, architects and engineers specialised in this construction method will increase.

Thirdly, it will also be an opportunity to reduce transport costs, which is essential with rising fuel prices in 2022. By completing much of the work offsite, only the transport of completed modules to the site for construction will be required. This reduces road travel by personnel and optimises project resources and time usage.


https://think.ing.com/articles/industrialisation-in-construction-weighing-up-lower-building-costs-against-higher-risks/
The digitalisation of industrialised construction

How PlanRadar can help industrialised construction project management

Industrialised construction is a step forward in the use of technology in construction. Digitisation is still a pending task in the sector, but there are more and more tools to weave the efficiency of technology and automated processes into the fabric of what is an essential sector in the European economy.

Against this backdrop, it is not surprising that the construction sector will undergo a paradigm shift on a large scale. More and more developers and construction companies will be interested in financing these types of projects, which are advocating for a more efficient, cost-effective and higher quality future. If this continues to grow, more professionals specialised in this type of construction system will be required, as they will be looking to work with professionals who can create and manage tailor-made projects for this type of work.

PlanRadar appears as a tailor-made solution for this, as this platform provides construction professionals with a new digital tool to make their day-to-day work easier. The platform allows them to manage and monitor the progress of their projects at a glance, as well as saving time on day-to-day tasks such as generating reports or reporting incidents. PlanRadar brings together all project information and documents in one place, making communication much smoother and easier for all involved.

PlanRadar applied to Industrialised Construction

✓ Digitalised task and incident management
✓ Management of BIM plans and models
✓ All documents on one platform
✓ Smooth communication with the whole team
✓ Customised reports
✓ Free access to subcontractors

Would you like to know more about how to apply PlanRadar to your projects and all its benefits?

Contact us for a free, no-obligation demonstration.

Try PlanRadar 30 days for free