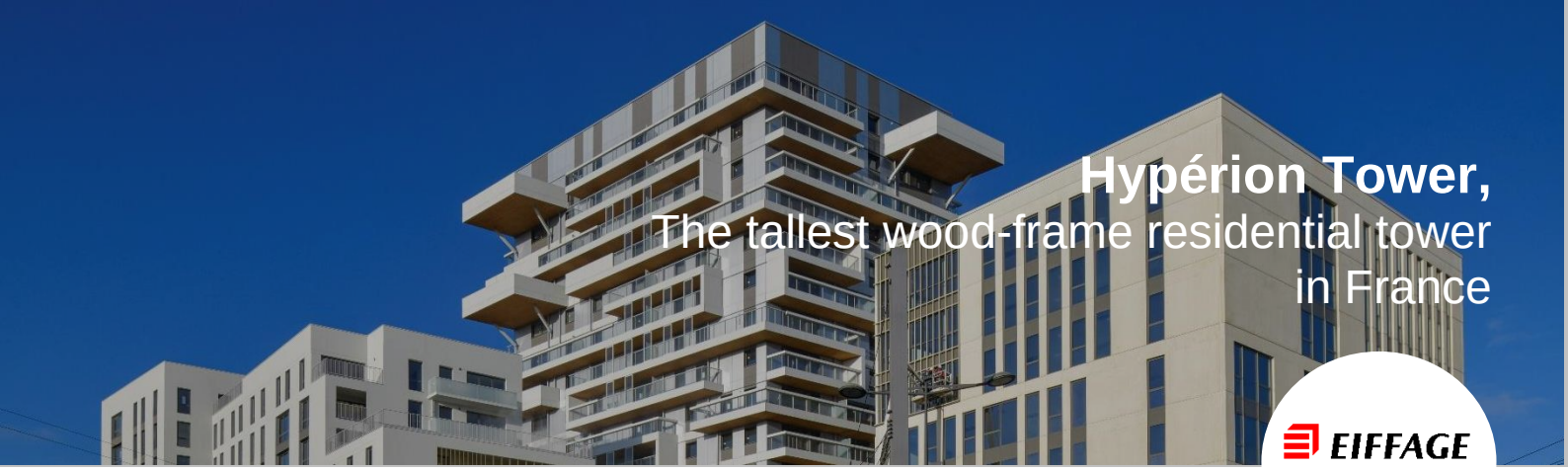

Hypérion Tower,
The tallest wood-frame residential tower in France

The Eiffage group is building the Hypérion tower in Bordeaux (Gironde). The tower has a carbon footprint of 870 kg CO2 eq. / m² floor area, which is 45% less than a conventional building. The project meets E3C2 energy and carbon performance standards, which aim to halve the carbon footprint of new buildings. Standing 50 metres high, this residential tower is currently the tallest wood-framed tower in Europe.

Starting date of the project	2015
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Project located at the Bordeaux Euratlantique EPA development site, within the Saint Jean Belcier business centre in Bordeaux (Gironde).
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Promote the use of wood as a substitute for conventional materials in building projects, in order to reduce the carbon footprint of construction activities.
Detailed project description	As part of the Bordeaux Euratlantique OIP project of national interest, the Bordeaux Euratlantique EPA (a public development agency) has committed to the development of a pilot/demonstrator project covering the construction of a residential tower (Hypérion development) close to Saint-Jean station in Bordeaux, as part of a mixed complex that also includes office space, social housing, commercial properties and a car park. The Hypérion construction project aims to promote low-carbon construction and the development of new eco-friendly building solutions. Wood is therefore being used to build the tallest and most complex building in the development, namely a residential tower containing 98 apartments over 17 floors. The central core (housing the elevator shafts and stairways), which acts as a brace frame, is built using reinforced concrete. The timber structure is made of wooden beams and posts, CLT (Cross Laminated Timber) floors, and patented "Hypermob"TM timber-framed walls. Standing 50 metres high, this residential tower is currently the tallest wood-framed tower in France. It represents an outstanding technical and environmental achievement, with a carbon footprint of 870 kg CO2 eq. / m² floor area, which is 45% less than a conventional building (conventional housing construction techniques are estimated by Ademe at 1,550 kg / m² floor space, including 1,000 kg for materials alone). The project meets the E3C2 energy and carbon performance standards, which aim to halve the carbon footprint of new buildings. Construction of the tower will require more than 1,400 m3 of timber. The local Nouvelle Aquitaine wood being used is certified by a specialist firm (Product DNA), which ensures traceability thanks to a forest source label. The Hypérion tower has been awarded level 3 for Bio-sourced materials, thanks in particular to the large quantities of wood being used in the structure and the use of gypsum boards for the Hypermob panels. The Hypérion tower also meets level 3 Biosourced materials and BBCA performance level standards. In addition, the tower is certified NF HQE 9 stars (excellent level). The Hypérion development won the Pyramide d'Argent - Grand Prix 2019 regional award and the Pyramide d´Or – Grand Prix 2019 national award, as well the BIM d´Or 2019. The project has received funding from Eiffage's internal E-Face carbon reduction fund, as well as grants from the Ademe Investments for the Future programme.
Main project's drivers for reducing the greenhouse gas emissions	

Reduction levers	**Details on the aspects of the project**
☐ Energy and resource efficiency (including behaviour)	
☒ Energy Decarbonisation	Heat production (heating and domestic hot water) provided by local heating networks from renewable and local resources (treatment of household waste by the energy recovery unit in Bègles, Gironde).
☒ Energy efficiency improvements	"Bioclimate" building design that enables a reduction in energy loss from the facades and better internal regulation (thanks to the building's low thermal inertia).
☐ Improving efficiency in non-energy resources	

☒ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	Carbon capture in construction timber, 1,400 m3 of solid wood (CLT and BLC)
☐ Financing low-carbon producers or disinvestment from carbon assets	
☐ Reduction of other greenhouse gases emission	

Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope

	Aspects of the project contributing to the reduction of emissions by emission category	Quantification of associated GHG emissions by emission category Please follow the quantification methodology used in the Afep guidelines.
Reduction of the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's activity.*	Construction site activities	25.2 tCO2eq.
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*		
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*	Construction materials and equipment Energy consumption during the lifespan of the building	5,968 tCO2eq.
Increase of carbon sinks		
Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, …)*		Minimum 850 tCO2eq. (data issued by FDES CLT France)
GHG emissions avoided by the company at third parties		
Avoided Emissions *Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.*		

Clarification on the calculation or other remarks: Calculations carried out according to E+C- standard

These values are given in absolute terms.
To determine carbon gains in comparison to a conventional tower, we have taken as a reference a tower labelled E2C1. N.B. Hypérion is labelled E3C2 (according to the French label “E+C-“)

Therefore:
For the energy consumption of the tower, carbon gains are estimated at 35.3 kWhpe / m².year
For construction materials and equipment, carbon gains are estimated at 144 kgCO2eq. / m² floor space

Physical quantities of materials used on the Hypérion tower:
1,400 m3 of wood including 6,000m² of CLT flooring and 304 MOB wooden facades

Modality of verification of the quantification.

Calculation standard used (ADEME base, GHG protocol, etc.): Approved LCA software for calculation of the "Carbon" element of the E+C- label

Verification of the calculation (internal or external): Verification via certifications and labelling, and via certified software such as Elodie

Other environmental and social benefits of the project

The project is based on a responsible consumption of materials. The project is certified level 3 for Bio-sourced materials, thanks to the use of more than 1,400 m3 of timber, and more than 100 m3 of Fermacell gypsum fibre panels. Subject to a Life Cycle Assessment (LCA), the Hypérion tower concentrates the equivalent of 1,000 tonnes of CO_2, which equates to a volume comparable to 9 years of energy consumption

	for this type of residential building. Over the entire lifespan of the building, the project will economise nearly 15 tonnes of CO_2 per dwelling. In terms of the responsible consumption of materials, the wood being used complies with eco-responsible labels and comes mainly from forests in the local Nouvelle Aquitaine area. A forest source label certified by Product DNA ensures traceability, essential for an accurate calculation of carbon footprint, from logging in the forest to supply at the construction site. As part of the Sekoya digital platform set up by Eiffage and dedicated to innovation and the identification of low-carbon materials and processes, the Circouleur start-up company located in Blanquefort (Gironde) has been contracted by the Group. Circouleur, which produces eco-responsible paints using recycled materials and paint products, is contributing the Hypérion project, helping to meet BBCA standards. **The project is contributing to the social and economic development of the local area**. The building's wooden structure is stimulating economic development in the timber industry, particularly through the supply of timber from regional forests. The prefabricated construction of the 141 bespoke balconies was carried out by a local company. Savare, which joined Eiffage Construction in 2018 bringing its expertise in the industrialised manufacture of wooden components, produced the timber-framed walls for the Hypérion tower. It continues to manufacture for new timber construction markets and is therefore contributing to reindustrialisation within France. Prefabricated bathrooms manufactured by Eiffage Construction (Wa'ood brand), which also contribute to reducing the carbon footprint of construction, have been installed in parts of the development. Finally, in accordance with the transformation of our business lines, Eiffage site workers have received specific training in woodworking professions. Eiffage Immobilier also supported the Cré'Atlantique Fund as part of this project, in order to sustain creativity in the local area, provide access to art for as many people as possible and contribute to the development of sustainable economic models in the creative sectors. This initiative supports public action in favour of art and economic development within the region. **The project takes into consideration the most vulnerable populations**. An integration clause has been signed between Eiffage Immobilier Sud-Ouest and the Bordeaux Employment Centre (Maison de l'Emploi), whose mission is to be active in the local area, coordinate initiatives in terms of access to employment and establish relationships between local employment and integration stakeholders, to provide a value-added service for businesses and job-seekers.
Project maturity level	☐ Prototype laboratory test (TRL 7) ☐ Real life testing (TRL 7-8) ☐ Pre-commercial prototype (TRL 9) ☐ Small-scale implementation **☒ Medium to large scale implementation** **Remarks**: Delivery expected in the second quarter of 2021
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	The project has not been reproduced in an identical form as yet, however the experiments and expertise developed feed into other current low-carbon construction projects. Prefabricated construction, including timber-framed walls, balconies, and prefabricated low-carbon bathrooms (Wa'ood brand) manufactured at the Eiffage Construction Industries factory in Fresnay-sur-Sarthe (Sarthe) on an industrial scale, make it easy to reproduce this type of construction. Furthermore, the investment grant awarded by Ademe is intended to enable reproduction of the design of this project, with a view to increasing the number of wood-based collective housing developments.
Amount of investment made (in €)	**Project cost : €18,066,921**
Economic profitability of the project (ROI)	☐ ST (0-3 years) ☐ MT (4-10 years) **☒ LT (> 10 years)** **Remarks: This is a pilot/demonstrator project, with profitability necessarily being over the long term**
Engaged partnerships	Contracting authority: Eiffage Immobilier Sud-Ouest Project management: Viguier Architecture Urbanisme Paysage Associated partners: Socotec - building control office CETAB - fluids consulting Aïda - acoustics consulting Terrel - structural consulting

	Woodeum – project management assistance
Open comments from the project owner	/
More about the project	
Contact the company carrying the project	Marc Simon - marc.simon@eiffage.com
Project URL links	http://Hypérion.eiffage.com/
Illustrations of the project	● Hypérion video