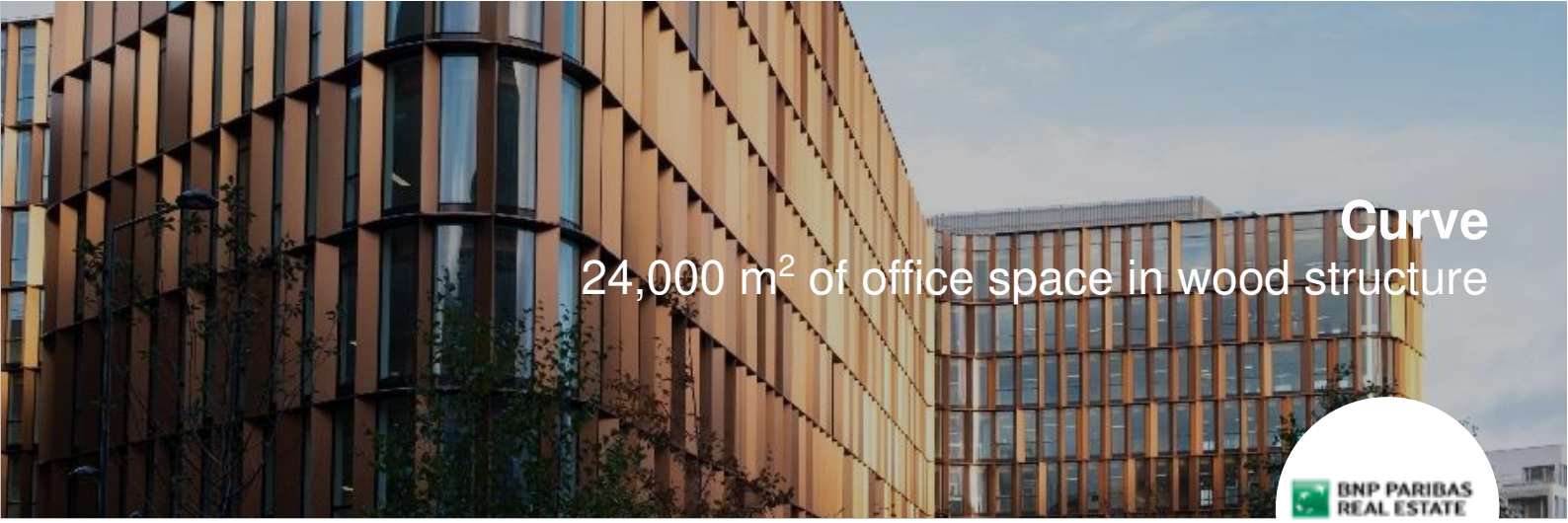

With a surface area of 24,000 m2, Curve is one of the largest wooden buildings ever made in France. Delivered in September 2020 and occupied by the ARS (Regional Health Agency), this particularly exemplary building aligns with BNP Paribas Real Estate's environmental objectives, thanks in particular to the numerous carbon optimisations integrated from the design stage.

Starting date of the project	December 2017
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Saint Denis, Seine Saint Denis.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Thanks to its wood frame structure, the Curve building meets the necessary need to reduce carbon emissions of the real estate industry.
Detailed project description	With nearly 24,000 m^2 of office space out of 7 levels, Curve is one of the largest wood structure buildings in Europe. The building runs on seven floors and four basement levels and has 1960 workstations. Located near the “Stade de de France” station on the RER B, Curve offers a wide range of services (business centre, co working, fitness, concierge, contemporary coffee, etc.), including several accessible terraces and generous landscaping gardens. The trays of nearly 3,000 m^2 have a free height above 2.70m and a depth of about 18m. The stairs and elevators cores are made of low carbon concrete (as are the infrastructure) and ensure the bracing and thermal inertia of the building. Mixed wood and concrete construction, as well as the implementation of the majority of CLT load-bearing walls (prefabricated), reduces the carbon impact relative to a traditional concrete structure and ensures carbon storage of 4,200 tons of CO_2. This constructive method, which relies heavily on pre manufacturing, also offers the advantage of the speed of onsite installation, allowing for a gain in terms of the execution schedule. Anodished aluminium sun-shadings also protect the façade. Other examples of carbon optimisation: • On technical batches: New generation refrigerant fluids generate a gain of 1,085 tons of CO_2 compared to standard fluids; • On interior coatings: Recycled sublayer carpets resulting in a gain of 180 tons of CO_2 compared to the reference values; • Working with manufacturers committed to reducing their environmental and voluntary impacts for writing environmental and health declaration sheets (FDES); • Tenant companies' participation for the carbon optimisation proposal on their lots. The building is committed to 40% below RT2012 in terms of its energy needs, aiming for HQE certification under the NF referential for tertiary buildings - starts HQE from 2015, with an Exceptional level passport, the Effinergie + label as well as the E + C level E2C1 and the BBCA level Standard label.
Main project's drivers for reducing the greenhouse gas emissions	

Reduction levers	**Details on aspects of the associated project**
☒ Energy efficiency and resources (in particular behaviours)	Low carbon concrete infrastructure, for a gain of 1,570 tons of CO_2 per contribution to a standard concrete infrastructure. Mixed wood/concrete superstructure, majority of CLT carrying walls Recycled sublayer carpets to generate 180 tonnes of CO_2 gains over the reference models.
☒ Decarbonisation of energy	On technical batches: Next generation refrigerant fluid resulting in a gain of 1,085 tons of CO_2 compared to standard fluids.
☒ Improving energy efficiency	The natural insulating characteristics of the wood used for the building envelope favours achieving the RT 2012-40% target

☐ Improving efficiency in non-energy resources	
☒ Emissions absorption: Creation of carbon sinks, negative emissions (BECCS, CCU/S, etc.)	Carbon absorption by wood used for structure construction at 4,200 tons of CO2.
☐ Financing of low carbon issuers or divestment of carbonated assets	
☐ Reduction of other greenhouse gases	

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

	Project aspects contributing to emissions reduction by emission category	**Quantifying associated GHG emissions by emission category** *Please respect the quantification methodology used in the Afep rating.*
Reducing the company's carbon dependency		
Scope 1 *Direct emissions generated by the company's business.*	Achievement of the BBCA level Excellence label as well as the E + C1 level E2C1 label Optimisation of the superstructure through the massive use of CLT wood and infrastructure through the use of low carbon cement Optimisation	873.4 kgCO2eq/m ² or 20,950 tons of CO2 (Quantifying E+C-, Eges PCE (Materials-related GHG)) Considers product renewal over 50 years
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*	Optimising the energy performance of the built and systems, in order to achieve E2 level (RT-30% equivalent) Use of Saint Denis' virtuous heat network (0,116 gCO_2/kWh)	215 $kgCO_2eq/m^2$ or 5,150 tons of CO_2 for 50 years (Quantifying E+C-: Energy Eges) 4.3 kgCO2eq/m ² or 103 tons of CO2 per year (Energy Eges)
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services on its value chain.*		
Increasing carbon sinks		
Emissions absorption *Carbon sink creation, (BECCS, CCU/S,...)*	Setting up CLT floors/sails and LC poles	Biogenic carbon storage of 176 $kgCO_2eq/m^2$ or 4,200 tons of CO_2 captured in the structure of the building (20% of total impacts of products and materials)
GHG emissions avoided by the company in others		
Emissions avoided *Emissions avoided by the activities, products and/or services of the company sponsoring the project or by financing emissions reduction projects.*		

Calculation details or other remarks: The E + C methodology was used for the calculations and orders of magnitude shown above. It is a method of calculating indicators relating to the energy balance and the environmental performance of the building over its entire lifecycle, particularly with regard to greenhouse gas emissions. It was set up by the ministries of energy transition and territorial cohesion, and complements the current thermal regulations applicable to new buildings (RT 2012). This approach defines CO_2 emissions over the following scopes:
- building construction: Estimated at 873 $kgCO_2$ per m ² of floor area on the Curve project
- Energy use in operation: Estimated at 103 tons of CO_2 per year on the Curve project

Modality of verification of the quantification.	**Calculation methods used (ADEME base, GHG protocol, etc.)** E + C- methodology **Calculation verification (internal or external):** External verification (BET ALTO)
Other environmental and social benefits of the project	During the project, residents were able to enjoy a dry, silent and fast mounting. Four months were required in total to mount the seven levels pre-manufactured bone. A 250 m2 brewery will be installed at ground floor

	With its cinded facades and unfamiliar, winding appearance, Curve not only puts a spotlight on timber construction and technical know-how, but also on the Montjoie district, where the Woodwork worksite, also in wood, is being completed. The building will now be the new headquarters of the ARS (Regional Health Agency). It will bring together teams once installed in the Millennium at Porte d'Aubervilliers and the Seine Saint Denis annexe in Bobigny. The purpose of this internal gathering is to facilitate coordination and exchange in the deployment of operations in the different territories. The significant reduction in the rent generated will be reinvested to enable the development of new actions.
Project maturity level	☐ Laboratory prototype test (TRL 7) ☐ Real Test (TRL 7-8) ☐ Pre commercial prototype (TRL 9) ☐ Small scale implementation ☒ Medium to large scale implementation **Remarks :** The project was built and delivered in September 2020.
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	The column/beam structure typology as well as the use of wood could be renewed and implemented on another construction project.
Amount of investment made (in €)	Not disclosed
Economic profitability of the project (ROI)	☐ CT (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years old) **Remarks:** Not disclosed
Engaged partnerships	No partnership has been engaged through this project.
Open comments from the project owner	The wood material was very well received by the new occupiers of the building, who were requesting to see the structural wood inside the building. Wood provides a sense of well being and is a very warm material.
Learn more about the project	
Contact the company carrying the project	jean-marc.vincent@realestate.bnpparibas
Project URL links	https://www.curve saintdenis.en/
Illustrations of the project	CURVE