New high school in the Clermont urban area

Eiffage is building a new high school in the Clermont urban area, under a design and build contract. Constructed using wood and straw, and with facades made of Volvic stone from the Massif Central, the building will meet high performance (E4 C2) standards.

Starting date of the project	Design: March 2019 Execution: August 2020 Delivery: July 2022
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Clermont-Ferrand (Puy-de-Dôme)
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Construct a building that provides maximum energy performance and minimum carbon impact (E4 C2 performance – maximum level - E+C standard - http://www.batiment-energiecarbone.fr/). Demonstrate the building's energy performance and promote development of these solutions.
Detailed project description	Project carried out under a design-build contract. Below are the main members of the consortium having contributed to the design, Eiffage Construction being the lead contractor: - CRR Architecture - Eodd - Sylva - Ingerop - Ecib - Eiffage Energie Systèmes The technical high school will accommodate 1,000 students and provide housing for 8 members of staff. Efforts made in terms of the thermal design of the building's outer skin and reduced energy requirements will enable the project to meet exemplary "passive" building performance standards. The building will benefit from "100% renewable energy" with the exclusive use of wood for heating purposes (wood pellets) and all electricity consumption being met by the photovoltaic installations. Thanks to the massive use of bio-sourced materials, the building will provide tangible carbon storage, which will drastically reduce its carbon impact. Concrete base made from low-carbon concrete supplied by Vicat. The straw-insulated wood frame walls are manufactured by Savare, a subsidiary of Eiffage Construction that specialises in wood construction (creation of a workshop close to the site to assemble the wood frame walls (MOB) and limit the carbon footprint of transportation). The straw is supplied by a farmer in Limagne. The glued laminated wood structure uses a Douglas fir species supplied by Eurolamelle. The CLT walls and floors (Douglas fir) are being supplied by Piveteau. The solid wood (Douglas fir) is being supplied by the Combrailles sawmill. All the framework, structures and wooden floors are manufactured and installed by Eiffage Construction Auvergne. Particular attention has been paid to the choice of products / suppliers / subcontractors in order to meet carbon objectives. This is the case in particular in terms of traceability of origin for the structural timber (92% from the Massif Central, 100% from France), straw (100% from the Limagne), and lava rock (100% from Volvic). Quantity of bio-sourced materials: 148 kg/m² (compared to 36 kg/m² to achieve the level 3 bio-sourced buildings label for educational buildings, see https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000026810976

“Reforest Action”: 2,000 trees replanted
Photovoltaic production: installation of 2,000 m² of panels assembled in France
Wood pellet boiler
High performance insulation using straw (R = 7.10m².K/W)
Recovery of rainwater for use in toilet blocks.

Main project's drivers for reducing the greenhouse gas emissions

Enter the information in the appropriate boxes

Reduction levers	Details on the aspects of the project
☐ Energy and resource efficiency (including behaviour)	
☒ Energy Decarbonisation	Use of renewable energies (2,000 m² of photovoltaic panels, biomass boiler)
☒ Energy efficiency improvements	E4 label (Positive energy building): good insulation, in situ energy production
☒ Improving efficiency in non-energy resources	Wood mix (100% French certified) / concrete (low carbon) Straw-insulated facades Recovery of rainwater for reuse in toilets
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	
☒ Financing low-carbon producers or disinvestment from carbon assets	“Reforest Action”: 2,000 trees replanted
☐ 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

Indicate the aspects of the project that contribute to the reduction of emissions per category of emissions considered (left-hand column) and the quantification of associated emissions.

Indicate the main hypotheses and calculation steps in the intended section (below the table)

For further details, please refer to the methodology guidelines.

	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.*	Worksite emissions. (lower thanks to the mobilisation of local players to reduce transport requirements).	265.9 tCO2eq.
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*		Included above
Scope 3 *Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.*	Upstream: Use of low-carbon concrete, mixed wood/concrete structure, particular attention paid to the choice of products / suppliers / subcontractors to meet carbon objectives Downstream: E4 labelling (positive energy building): Good insulation, in situ energy production.	12,120 tCO2eq. over 50 years of operation, i.e. 242.4 tCO2/year on average. (i.e. 15 kgCO2eq/year/m²) A C1 building (“conventional” scenario today) with similar characteristics would have emitted approximately 28,126.4 tCO2eq.
Increase of carbon sinks		
Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, …)*		50 tCO2/year
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.*	Compared to a building with C1 certification	320 tCO2/year, or over total lifetime 16,006.5 tCO2eq.

Clarification on the calculation or other remarks: Calculation carried out according to E+C- standard not taking into account dynamic LCA.

Operating emissions are mainly related to:
- primary energy consumption (RT use): 10,486 kWhep/year, including energy production of 9,870 kWhep/year for self-consumption (EF: 45 gCO2/kWh for photovoltaics), the rest on the network (EF: 60 gCO2/kWh)
- heating and hot water: 100% biomass (wood pellet boiler) (EF: 0.027gCO2/kWh PCE), instead of a conventional solution (0.243 gCO2/kWh PCE)

	Forest planting: The calculation described here is based on assumptions made by the Ecotree organisation: we take their value of 25 kgCO2eq/year average absorbed by a tree (it being acknowledged that this value varies throughout the life-cycle of the tree depending on age or external factors). It is important to keep in mind that the carbon storage calculation is approximate and provides more of an estimate than a comprehensive value.
Modality of verification of the quantification.	**Calculation standard used (ADEME base, GHG protocol, etc.):** E+C- reference (INIES base) **Verification of the calculation (internal or external):** In progress externally according to labelling standards
Other environmental and social benefits of the project If possible, list the impacts and Sustainable Development Objectives concerned	The 16,000 m² establishment maximises the use of local resources, both in terms of manpower (local companies and subcontractors), construction methods (wooden framework from Massif Central forests and straw insulation from Limagne), and energy supply choices. Savare, a subsidiary of Eiffage Construction specialising in the manufacture of timber structures, chose to set up a workshop in the immediate vicinity of the site in order to make the best use of local resources. This workshop is set to remain open depending on market potential, with the opportunity for several permanent jobs. The project therefore contributes to several SDGs:  In addition, the wood frame and compressed straw insulation walls benefit from a guaranteed French traceability label. Owners and customers rightly demand better knowledge of the origins of building materials used. For this reason, since 2017, Eiffage has voluntarily committed to a process of wood traceability from the forest to the construction site, which provides the highest levels of transparency for customers. Since 2017, the Sustainable Development and Transverse Innovation Department has been working with Swiss firm Product DNA, an independent expert in supply chain traceability. Product DNA traces materials from the design phase of the project, reconstructing their entire journey based on accounting documents, and publishes labels on delivery of the project concerned. These labels provide specific information on the origin of the supplies, transformation sites, and sustainable management of the resource used, stored in a tamper-proof blockchain system.
Project maturity level Tick the corresponding current 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**: 16,500 m² of SDP / 11, 000 m² of straw-insulated timber frame walls
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	100% reproducible
Amount of investment made (in €)	Total investment by the AURA Region amounts to €57.5 million
Economic profitability of the project (ROI)	☐ ST (0-3 years) ☐ MT (4-10 years) ☒ LT (> 10 years) **Remarks:** click here to enter the information
Engaged partnerships	Major synergies between the Group's subsidiaries for the design and execution of this project: Eiffage Génie civil Forézienne Savare Eiffage Energie Systèmes Clévia Eiffage Route Eiffage Construction Auvergne
Open comments from the project owner	xxx
More about the project	
Contact the company carrying the project	Vincent.dhuicq@eiffage.com

Please specify an ad hoc e-mail address that will allow the reader to contact the project company directly	
Project URL links	https://www.auvergnerhonealpes.fr/actualites/le-nouveau-lycee-de-clermont-ferrand-sappellera-gergovie https://www.eiffageconstruction.com/metiers/realisation/nouveau-lycee-de-lagglomeration
Titre SEO	Construction of a new high school in the Clermont-Ferrand area under a design-build contract
Méta Description	Eiffage is building a high school made of wood, straw and Volvic stone cladding with E4 C2 performance.
Illustrations of the project 3 photos/videos minimum (in HD format to be attached)	See attached (Photo credits: JOEL DAMASE)