

ABC (Autonomous Building for Citizens)

1er concept de résidence autonome de France



Designed by Bouygues Construction's R&D teams with the architectural office Valode & Pistre, ABC (Autonomous Building for Citizens) is the first autonomous building concept in France. This type of building could reduce the carbon footprint of operations in island or remote areas, in addition to having a lower environmental footprint than the average building.

Starting date of the project	01/07/2018 - End : 01/06/2020
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Grenoble, Isère.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	<p>The ABC project is a new building concept based on three pillars: A for autonomous, B for sustainable and intelligent building and C for citizen.</p> <p>One of the objectives is to reduce the carbon footprint of the construction and operation of this residential building by activating the following levers:</p> <ul style="list-style-type: none"> - Use of CO2-reduced concrete and bio-sourced materials - Energy efficiency through occupant involvement - Optimisation of the energy efficiency of the building - 70% autonomy in daily electricity consumption - Division of the water consumption of the network by 3 - 40% reduction in grey waste
Detailed project description	<p>ABC (Autonomous Building for Citizens) is the first autonomous residence concept in France. It was designed entirely by Bouygues Construction's R&D teams with the architectural firm Valode & Pistre. It is being developed and built by teams from Linkcity (the Group's property developers) and Bouygues Bâtiment Sud-Est for the city of Grenoble. It was delivered in September 2020. The residents are being helped to reduce their consumption in this new type of housing, as their involvement in the life of the building is a central element of the project.</p> <p>The autonomy of this building is based on 3 pillars that contribute to reducing the carbon footprint of the residence:</p> <ul style="list-style-type: none"> - Sobriety, thanks to an application that allows occupants to monitor all consumption, to control equipment (including heating systems) and to raise awareness of good practices among users. The complex includes 180 bicycle spaces and 360 m² of vegetable gardens to encourage wider behavioural changes. - Energy performance of the building: use of reinforced insulation (cork insulation, triple glazed windows, A+++ household appliances; LED lighting) - Reduction of energy and water consumption: this is based on local production and distributed in short circuits. Beyond the carbon gains, the local production of photovoltaic electricity integrated into the building supports the national deployment objectives by reducing the footprint of the panels (since they are integrated into the building). <p>The ABC building aims to be 70% self-sufficient in electricity, to reduce its water consumption by 2/3 compared to a conventional residence (i.e., more than 50L saved per day and per person) and to reduce household waste by 40%. In addition to the resource savings, the reductions in water consumption and waste result in a carbon gain of approximately 40 teqCO₂ over the life of the building.</p> <p>In addition, the carbon footprint of the construction is also reduced using concrete with reduced CO₂ emissions. In particular, the use of low-carbon CEM IV concrete has reduced the CO₂ that would have been emitted by conventional concrete (i.e., CEM II/A) by more than a third, 270 teqCO₂.</p> <p>The housing complex consists of two buildings, representing a built area of 5000 m², with 62 flats (42 intermediate rental flats and 20 social rental flats). The ABC (Autonomous Building for Citizens) demonstrator, France's first autonomous residence, won a prize at the BatiActu Construction Awards in September 2020. It was delivered in Grenoble in summer 2020 by teams from Linkcity and Bouygues Bâtiment Sud-Est.</p>

	The project received a mention at the "Green Solutions Awards 2020-2021" in the "Grand Prix Quartier Durable" category.																												
<p>Main project's drivers for reducing the greenhouse gas emissions</p> <p>Enter the information in the appropriate boxes</p>	<p>Reduction levers</p> <p><input checked="" type="checkbox"/> Energy and resource efficiency (including behaviour)</p> <p><input checked="" type="checkbox"/> Energy Decarbonisation</p> <p><input checked="" type="checkbox"/> Energy efficiency improvements</p> <p><input checked="" type="checkbox"/> Improving efficiency in non-energy resources</p> <p><input type="checkbox"/> Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)</p> <p><input type="checkbox"/> Financing low-carbon producers or disinvestment from carbon assets</p> <p><input type="checkbox"/> Reduction of other greenhouse gases emission</p>	<p>Details on the aspects of the project</p> <p>Controlled heating system</p> <p>Self-consumption of electricity (70%), injection of renewable electricity into the grid and short circuit water supply</p> <p>Reinforced insulation of the building</p> <p>Use of concrete with reduced CO2 emissions for the construction, use of biosourced materials (insulation)</p>																											
<p>Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope</p> <p>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.</p> <p>Indicate the main hypotheses and calculation steps in the intended section (below the table)</p> <p>For further details, please refer to the methodology guidelines.</p>	<table border="1"> <thead> <tr> <th data-bbox="475 685 817 931"></th> <th data-bbox="817 685 1197 931">Aspects of the project contributing to the reduction of emissions by emission category</th> <th data-bbox="1197 685 1544 931">Quantification of associated GHG emissions by emission category</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="475 931 1544 958">Reduction of the company's carbon dependency</td> </tr> <tr> <td data-bbox="475 958 817 1059"> <p>Scope 1 <i>Direct emissions generated by the company's activity.</i></p> </td> <td data-bbox="817 958 1197 1059">Construction site emissions (e.g., transport of materials).</td> <td data-bbox="1197 958 1544 1059">Marginal. 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	<p>Clarification on the calculation or other remarks: The values considered for the calculation are taken from the E+C- studies.</p> <p>Over its lifetime, the ABC concept demonstrator will save more than 1000 tCO₂e compared to a "conventional" new housing building. This considers both material and operational energy savings.</p> <p>The benchmark is based on a sample of 11 concrete housing buildings in an equivalent climate zone in Grenoble.</p>
Modality of verification of the quantification.	<p>Calculation standard used (ADEME base, GHG protocol, etc.): The calculation framework used is an E+/C- compliant life cycle analysis, considering the ESDS of the materials considered or the INIES database for other emission items (e.g., as for drinking water). Estimates of the carbon gains associated with the project (or avoided carbon) were calculated internally and are based on this reference framework.</p> <p>Verification of the calculation (internal or external): click here to enter the information</p>
<p>Other environmental and social benefits of the project</p> <p>If possible, list the impacts and Sustainable Development Objectives concerned</p>	<p>In addition to reducing greenhouse gas emissions, this project will:</p> <ul style="list-style-type: none"> • Reduce water consumption; • Reduce waste production (improved sorting at source, monitoring of waste by weighing on site, recovery of putrescible waste in the vegetable gardens); • Raise awareness of good environmental practices among residents.
<p>Project maturity level</p> <p>Tick the corresponding current maturity level</p>	<p><input type="checkbox"/> Prototype laboratory test (TRL 7)</p> <p><input type="checkbox"/> Real life testing (TRL 7-8)</p> <p><input type="checkbox"/> Pre-commercial prototype (TRL 9)</p> <p><input checked="" type="checkbox"/> Small-scale implementation</p> <p><input type="checkbox"/> Medium to large scale implementation</p> <p>Remarks: the building now has about 60 accommodation units.</p>
<p>Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential</p>	<p>The concept of autonomy makes it possible to be free of infrastructure and networks. This is of major interest in areas:</p> <ul style="list-style-type: none"> • Where there is no infrastructure (island areas, remote areas, inaccessible areas etc.) • Where networks can be subject to various hazards such as natural disasters or periods of saturation. Indeed, the French/European network is exceptional, but in some area's blackout periods are frequent and represent a real problem. • Where social and societal issues prevent the creation of new infrastructures. <p>The climate impact will be even more important as the country's energy mix is carbon-based.</p>
Amount of investment made (in €)	Confidential
Economic profitability of the project (ROI)	<p><input type="checkbox"/> ST (0-3 years)</p> <p><input type="checkbox"/> MT (4-10 years)</p> <p><input type="checkbox"/> LT (> 10 years)</p> <p>Remarks: click here to enter the information</p>
Engaged partnerships	<p>Developed by Bouygues Construction's R&D.</p> <p>Project owner : Linkcity</p> <p>Designers : Bouygues Bâtiment Sud-Est, Architect Valode et Pistre. Suez (design of the water management system).</p> <p>Other partners: Vicat (low-carbon concrete). Saint-Gobain (bio-sourced insulation). City of Grenoble, Auvergne Rhône-Alpes Region, French Government (Future Investment Programme); Banque des Territoires, ADEME, Grenoble Habitat, Innovia, GEG, Grenoble Alpes Métropole</p>
Open comments from the project owner	xxx
More about the project	
<p>Contact the company carrying the project</p> <p>Please specify an ad hoc e-mail address that will allow the reader to contact the project company directly</p>	presse@bouygues-construction.com
Project URL links	Habitat durable : le concept ABC Bouygues Construction (bouygues-construction.com)
<p>Illustrations of the project</p> <p>3 photos/videos minimum (in HD format to be attached)</p>	VIDEO: ABC, a New Paradigm for Housing - YouTube

