Installation of new generation **cooling systems**

STMicroelectronics is implementing new generation chillers and free cooling systems to improve the energy performance of its sites and reduce their consumption of natural gas.

Starting date of the project	May 2020
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	STMicroelectronics sites in Crolles (Isère), Rousset (Bouches-du-Rhône), Tours (Indre et Loire), and Rennes (Ille et Vilaine), all located in France.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Improve the energy performance of the industrial processes used and decarbonize the energy used on these sites.
Detailed project description	This project includes two actions: • The installation of refrigeration units with energy recovery, which offer two main advantages. Refrigeration units cool down the production equipment in the clean room more efficiently than the current units. The heat recovered from these refrigeration units is used to heat the sites' offices, without having to use traditional town gas boilers. • The installation of a free cooling system that uses the outside air to cool down the production equipment, thereby reducing the use of refrigeration units in the intermediate seasons. The structural design phase began in Q4 2020 and the project will be completed in 2021.

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	Less use of gas boilers
☒ Energy efficiency improvements	More efficient equipment (cooling units with energy recovery)
☐ Improving efficiency in non-energy resources	
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	
☐ 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.*	Lower use of gas boilers to heat clean rooms or offices	1,300 tCO_2/year
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*	The chillers and free cooling systems use less electricity	300 tCO_2/year
Scope 3		

	Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.		
	Increase of carbon sinks		
	Emissions Absorption *Carbon sinks creation, (BECCS, CCU/S, …)*		
	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:

Using the heat produced by the operation of the cooling units lowers the consumption of natural gas (7.27 GWh[GCV]/year) or 1,338 tCO_2/year (considering an emission factor of 184 tCO_2/GWh GCV).

The increased efficiency of the chillers and the use of free cooling systems saves 6.9 GWh/year, which represents 300 tCO_2/year considering an emission factor of 43 tCO_2/GWh.

Modality of verification of the quantification.	**Calculation standard used (ADEME base, GHG protocol, etc.):** The electricity and city gas emission factors for France are from the ADEME database. **Verification of the calculation (internal or external):** External verification will be done through the energy performance contract: on-site measurements, according to ISO 50001.
Other environmental and social benefits of the project	Installing new generation cooling systems contributes to the following Sustainable Development Goals (SDGs): • SDG 7 Affordable and Clean affordable energy: lower energy use (heat recovery, and more efficient cooling units) and lower energy carbonation (free cooling from the outside air). • SDG 9 Industry, Innovation, and Infrastructure: improving the sustainability of ST's industrial site, thanks to lower operating costs and reduced equipment obsolescence.
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**: click here to enter the level of maturity of the project
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	The chillers with heat recovery and free cooling systems can also be installed on other sites in Europe. The feasibility study is underway. These systems can also be installed on sites outside Europe. The potential is equivalent to the total for Europe. The feasibility study will take place in 2021.
Amount of investment made (in €)	More than 10 M€ have been invested in this project for the 3 sites.
Economic profitability of the project (ROI)	☒ ST (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years) **Remarks:** 550 k€ of return on investment per year (reduction in electricity and gas bills). The project also reduces the risk of equipment obsolescence.
Engaged partnerships	Two partnerships have been established with: • EDF-Dalkia • Engie
Open comments from the project owner	/
More about the project	
Contact the company carrying the project	sustainable.development@st.com
Project URL links	/

Illustrations of the project