Implementation of a district cooling system
on the Punggol digital district in Singapore

ENGIE will design the integrated district cooling system (30,000 tons of refrigeration, 105 MW) that will serve both the Jurong Town Corporation (JTC), the Singapore Institute of Technology (SIT) and community facilities. This facility will centralize the cooling needs of the Punggol Digital District and thus optimize energy consumption.

Starting date of the project	February 2020
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Punggol district in Singapore
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	This project aims to deploy an interconnected district cooling network to serve both the Jurong Tower Corporation (JTC) and Singapore Institute of Technology (SIT) development and community facilities. This network will have to meet the stringent energy efficiency requirements of the digital district and will have a total cooling capacity of approximately 30,000 tons of refrigeration (105 MW).
Detailed project description	In March 2019, the group was selected by SIT and JTC Corporation (JTC) to design the 30,000-ton district cooling system for the new campus, the Punggol Digital District. The Punggol Digital District is the first district in Singapore to adopt a unique integrated master plan approach, bringing together a business park, a university and community facilities. The goal is to create synergies, enable integration between industry and academia, as well as drive strong and vibrant communities. As the flagship of Singapore's Smart Nation, the district will be home to burgeoning sectors in the digital world, such as cyber security and digital technologies, and will comprise an open innovation ecosystem. As the first district cooling system to meet the requirements of the Platinum Green certification, which sets sustainability standards for buildings in Singapore, the energy efficiency of the Engie-designed facility is an important factor in the design. The integration of JTC's and SIT's cooling networks allows the district's cooling needs to be centralized, thereby reducing energy consumption and carbon footprint.
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	
☒ Energy efficiency improvements	Interconnected district cooling network
☐ 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.*		
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.*	Interconnected district cooling network	110,000 tons of CO2 avoided compared to a building-specific cooling solution
	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 /

Modality of verification of the quantification.	**Calculation standard used (ADEME base, GHG protocol, etc.):** GHG Protocol **Verification of the calculation (internal or external):** Internal audit performed on earnings calculations.
Other environmental and social benefits of the project	This project develops the attractiveness of the district through its energy efficiency, for talents and new companies concerned about the ecological impact of their activity. It meets at least 3 objectives: the creation of job opportunities for young people, the financing of basic infrastructure projects and the fight against global warming
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**: /
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	A project that can be duplicated without too much difficulty. We are already doing it on other projects in other countries projects in other countries (Italy, USA, ...). The reproducibility of this project is not subject to any technical constraints.
Amount of investment made (in €)	Not available for external communication
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	Through this project, a partnership between ENGIE and JTC-SIT has been established.
Open comments from the project owner	Chan Wing Leong, vice president (campus development) and chief investment officer of SIT, said, "We envision our new campus to be a benchmark digital-focused green university for the region. ENGIE's strong track record of leveraging smart innovations to help customers accelerate their energy transition gives us confidence that our vision will be realized even faster."
More about the project	
Contact the company carrying the project	Li Rayne Rayne.li@engie.com
Project URL links	https://www.engie.com/breves/reseau-froid-quartier-numerique-punggol-singapour

Illustrations of the project