Recovery of waste heat from cooler units within Thales Toulouse site's data center, to provide heating for the site

Thales has installed a heat recovery system within its data center on its Toulouse site in order to reduce its carbon footprint by replacing gas heating with a system that uses the calorific energy produced by the data center. It is also used for the cooling and air conditioning of less energy-consuming systems, adjusting when necessary for seasonal cold weather conditions.

Project start date	The project was launched in March 2020, and finalised in December 2020
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable	The project is located on the Thales AVS France SAS site in Toulouse, on which there is a data center used by several Thales entities.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	In line with Thales' strategy for a low-carbon future, the priority is to reduce, or even completely phase out, the use of fossil energy on our sites, in two ways: - through the insulation of the buildings, since fossil energy (gas) is mainly used for heating purposes on our sites, - by recovering the waste heat produced by industrial equipment and using it to heat our sites. Refrigerant fluids in the cooler units used to maintain a low temperature in the data center constitute another source of carbon emissions. Therefore, the project had three objectives: (i) to recover the heat produced by the data center, (ii) to replace the refrigerant fluids used in the cooler units by a gas that has a smaller carbon footprint and (iii) install comfort cooler units whose electricity consumption adjusts according to the required cooling capacity.
Detailed project description	Replacement of old cooler units used on the site and in the data center by modern cooler units with heat recovery and more environmentally friendly gases, as well as injecting the hot water generated into the site's heating system. As regards the comfort cooler units, the replacement of the units goes hand in hand with automated functions (linked to the BACS directive) enabling them to be operated according to the external temperature. Gas continues to be used in the event of intense cold conditions.
Main project's drivers for reducing the greenhouse gas emissions Enter the information in the appropriate boxes	

Drivers for reduction	Details of aspects of the project
☒ Energy and resource efficiency (including behaviour)	Modern machines Adjusting the consumption of units according to the required cooling capacity
☒ Energy Decarbonisation	Replacing gas used for heating purposes by thermal electrically-produced energy from digital servers
☒ Energy efficiency improvements	Adjusting the consumption of units according to the required cooling capacity
☐ Improving the efficiency of 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	Replacing refrigerant fluids used in cooler units by gases that pollute less

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.*	Reduce the use of gas for heating purposes on site. Reduce emissions due to leaked refrigerant fluids from cooler units	170 tCO2e/year are saved as regards heating compared to 2018 thanks to a 40% reduction of gas consumption for heating purposes. On top of this reduction, there is also a reduction of emissions linked to recurrent leaks of refrigerant fluids from old cooler units (R134a). For example in 2018, leaks represented 82kg of R134a, the equivalent of 118 tCO2e. After changing the refrigerant fluids, replacing R134a by HFO ZE1234, a similar leak today would represent 82*7= 0.574 tCO2e (the GWP of ZE1234 being 7). Overall, thanks to these two drivers, 117.5+170 = 287.5 tCO2e have been saved compared to 2018.
Scope 2 *Indirect emissions associated with the company's electricity and heat consumption.*	Increase the consumption of electricity via cooler units in order to recover the heat, compensated by ceasing to use gas for heating purposes	Annual overconsumption of electricity due to heat recovery = an extra 191 MWh, equivalent to 11 tCO2e This is compensated by savings made thanks to the installation of a variable flow cooler unit and improved EPC.
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: Calculation carried out as part of a contract relating to energy performance

Modality of verification of the quantification

Verification of the calculation externally by the company GEO PLC **and implementation of an energy performance contract with VINCI on the equipment.**

Other environmental and social benefits of the project

If possible, list the impacts and Sustainable Development Objectives concerned

xxx

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:** Heat recovery from cooler units has been implemented on 70% of units on the 14 Thales Avionics sites in France
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	Following this project, another project is underway on the Elancourt site, where data centers are in place, and this will enable savings of 1500 tCO2e per year.
Amount of investment made (in €)	€1.8 M financed 100% by the Energy Saving Certificates
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	Partnership with Vinci to carry out the project
Open comments from the project owner	The next steps for the project will be to completely stop using gas, provided that we can increase the temperature of the hot water network from the heat recovery unit via a heat pump type device.
More about the project	
Contact the company carrying the project Please specify an ad hoc e-mail address that will allow the reader to contact the project company directly	Alice Pruvot, Group and Innovation +33 7 70 27 11 37 alice.pruvot@thalesgroup.com
Illustrations of the project 3 photos/videos minimum (in HD format to be attached)