On-site implementation
of renewable-energy solutions

In order to decarbonize some of the energy used on its Milmort site, Safran implemented three types of renewable-energy installation: solar panels, a wind turbine and cogeneration plants fueled by locally-produced biogas

Starting date of the project	2018
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Project implemented on the Safran Aero Boosters site in Milmort, Wallonia, Belgium. The project can be partly or fully reproduced on all of the Group's sites depending on the geographic location and legislation in place. ○ The installation of solar panels is the simplest solution to carry out, even in countries such as Belgium and the United Kingdom. ○ Cogeneration is also a simple technology to implement. It is feasible wherever the electricity mix is not decarbonized. ○ The installation of an industrial wind turbine is complex, highly dependent on the site's layout (windy site, but also proximity of buildings and orientation) and the legislation in place.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	To decarbonize the energy used on the Milmort site through the implementation of cogeneration systems, solar panels and an industrial wind turbine.
Detailed project description	The on-site production of renewable energy, including self-consumption, is the best way to decarbonize the energy required to operate the site (industrial processes or infrastructure). • **Cogeneration:** the aim of this project is to increase the site's independence in electric power while improving overall energy performance through the use of highly efficient cogeneration plants. The cogeneration plants consist of internal combustion engines that generate electricity (1,200 kW and 400 kW) and heat from biogas. The biogas, generated from agricultural waste, is produced in a methanation unit located within a radius of 50 km. The cogeneration plants are primarily used to produce the heat required by the site (domestic hot water and heating, but also process heat required by certain procedures). The electricity that is cogenerated is injected into the internal network (self-consumption). One of the cogeneration plants has a buffer hot-water storage tank to better regulate and store energy. • **Solar panels:** these panels are installed on the roofs. It is the most profitable solution (lower installation costs, no planning permission is required as these installations benefit from a waiver if they are mounted on a roof, which is not the case of ground-mounted or parking-lot canopy installations). This type of installation is very quick to implement; the project was carried out in a few months (approximately six months between the start and the connection to the internal network). At the moment, there are enough operators who are capable of undertaking this type of project efficiently. In Belgium, the annual output of the solar panels is 1,000 kWh per kWp installed, which is more than enough to strike a financial balance (based on generation statistics available since 2009). • **Wind turbine:** due to strict technical and urban-planning criteria, the site only had a small area in which a mid-size industrial wind turbine could be installed (~ 1 to 1.5 MW). The file was compiled by an experienced wind-turbine operator, which is necessary as this type of project is technically and administratively complex. Following this pre-study, the permit application was submitted to the relevant authority. The permit was issued 18 months after the project was launched. As from the date of issuance, it takes almost 18 months for the wind turbine to be connected to the network and to generate electricity. In Belgium, a large onshore wind turbine generates annually from 2,200 to 3,000 MWh per MW installed (based on generation statistics available over the past 10 years).

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	Replacement of electricity taken from the Belgian network with electricity generated by the site
☐ Energy efficiency improvements	
☐ 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.*	Burning of biogas in the cogeneration plants	-967 tCO_2 / year

Scope 2
Indirect emissions associated with the company's electricity and heat consumption.
	• Cogeneration: coproduction of electricity
	• Solar panels:
	  ○ Finalized
	  ○ Planned
	• Wind turbine
		• Cogeneration: coproduction of electricity: -1,994 tCO_2/year
		• Solar panels:
		  ○ Finalized: -50 tCO_2/year,
		  ○ Planned: -250 tCO_2/year
		• Wind turbine: -454 tCO_2/year (2022)

Scope 3
Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.
	• Biogas: production
	• Solar panels:
	  ○ Finalized
	  ○ Planned
	• Wind turbine:
		• Biogas: (+ 250 tCO_2/year)
		• Solar panels:
		  ○ Finalized: + 8 tCO_2/year
		  ○ Planned: + 40 tCO_2/year
		• Wind turbine: + 20 tCO2/year

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.*	Biogas: emissions avoided by the farmer	-1,144 tCO_2/year

Further details on the calculation or other remarks: click here to specify

Before the project, the Milmort site used 48,371 MWh of energy per year:

- 21,376 MWh of fossil energy (Natural gas; EF = 0.227 tCO_2/MWh LCV) per year for the heating of the buildings and the heat requirements of the industrial processes
- 26,995 MWh of electricity taken from the Belgian network (EF = 0.277

tCO_2/MWh) Namely, CO2 emissions of 12,330 tCO_2/year

The project covers these energy needs (considered to be equal to the pre-project situation)

- 10,400 MWh of biogas (EF = 0.024 tCO_2/MWh LCV) per year for heating and the heat requirements of the industrial processes
- 7,200 MWh of electricity generated from cogeneration (EF = 0 tCO_2/MWh, in the case of cogeneration, the EF is applied to heat)
- 1,080 MWh of electricity generated from solar panels (EF = 0.045 tCO_2/MWh)
- 2,000 MWh of electricity generated from the wind turbine (EF = 0.010 tCO_2/MWh)

This results in an improvement in CO_2 emissions of around 4,890 tCO_2/year

Modality of verification of the quantification.	**Calculation standard used (ADEME base, GHG protocol, etc.):** Emission Factors according to ADEME, except the electricity network (Wallonia region value) **Verification of the calculation (internal or external):** All of these projects are easy to measure with (gas or electricity) meters.
Other environmental and social benefits of the project	This project fully meets SDG 7 Affordable and clean energy. It also contributes to SDG 9 Industry, Innovation and Infrastructure, as it enables the site's modernization (greater energy independence, modernization of infrastructure)
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	All of these projects can be reproduced, subject to compliance with the legislation and any incentives in place. These projects also desensitize a site to market prices thanks to energy that is less expensive than that sold on the market. In the least favorable scenario, the energy price is identical to that of the market. This is the case, for example, for biogas, for which regional assistance measures offset the additional cost when the biogas is used in a cogeneration plant. However, the decarbonization is significant. To reproduce this project successfully, the assistance of experienced suppliers is necessary. These suppliers must also be familiar with existing legislation and incentives, which are often complex. It is therefore important to rely on local players for each area.
Amount of investment made (in €)	**Cogeneration:** €1,400,000 including the renovation of the boiler and electric infrastructure (ROI measured < 3 years). **Biogas:** CAPEX = €0. **Solar panels and wind turbine:** projects involving third-party investors. CAPEX = €0.
Economic profitability of the project (ROI)	☒ ST (0-3 years) ☐ MT (4-10 years) ☐ LT (> 10 years) **Remarks:** • **Cogeneration:** the electricity produced is 20% less expensive than that of the network; in addition, heat is produced (this heat is therefore free). • **Biogas:** financial compensation through regional incentives. No additional cost, no gain. • **Solar panels:** the electricity produced is "free". Recurring payment of the installation's maintenance. It accounts for 30% to 40% of the contractual price of the electricity depending on the size of the installation (financial conditions in Wallonia). The gain is therefore 60% to 70% of the price of the electricity. • **Wind turbine:** the electricity produced is "free". Recurring payment of the installation's maintenance, in proportion to the electricity produced.
Engaged partnerships	As all of these forms of technology are very mature, these projects are carried out within a client-supplier framework. • Cogeneration: contract with a local company. Project based on own funds. • Biogas, solar panels and wind turbine: contract with Luminus, EDF's Belgian subsidiary.
Open comments from the project owner	This type of project is relatively easy to carry out at the moment with the assistance of experienced players. It is therefore logical to do something that is easy and provides a rapid financial return and a return in terms of reducing CO_2 emissions. It is nevertheless important to calibrate these projects in relation to the needs of the site both today and tomorrow, when consumption reductions will be implemented.
More about the project	
Contact the company carrying the project	eric.englebert@safrangroup.com
Project URL links	http://www.apere.org/fr/production-electrique-renouvelable

Illustrations of the project