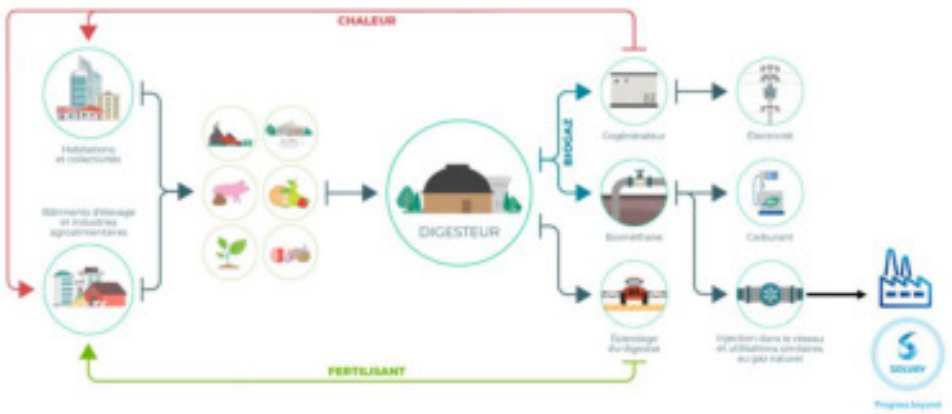
Biomethane switch :
biomethane supply from several production sites

In order to decarbonise the heat needed for the processes operated by Solvay, the company has decided to substitute natural gas and supply its installations with biomethane.

Starting date of the project	2020, February
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Several future new installations spread around the territory (Aube, Marne, Seine et Marne, Meurthe and Moselle, Ardèche, etc.) will benefit from a supply of biomethane. The first productions have started in February 2020 and will continue to ramp up until the end of 2023. Several Solvay sites will consume this biomethane, in particular Melle and Saint Fons (GBU Aroma Performance), La Rochelle (GBU Special Chem), and Collonges (GBU Silica).
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	The objective of the project is to decarbonise the heat necessary for the processes operated by somes Solvay sites in France, replacing natural gas with biomethane purchased directly from producers and transported to Solvay's sites through guarantees of origin.
Detailed project description	Solvay has signed long-term contracts (15 years) with producers for the supply of biomethane from new facilities to be built (anaerobic digestions), participating in the development of french biomethane sector. In total, 15 contracts were concluded with biomethane producers over the last 12 months including new investments (€4M per unit) which will be commissioned in 2021 and 2022. As a gas supplier in France, Solvay commitment in these contracts covers both the gas and guarantees of origin. 
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	Partial Substitution of Natural Gas consumed by bio-methane
☐ 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.*	Partial Substitution of Natural Gas consumed by bio-methane	41.4 ktCO2/year
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.*		
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:

The project substitutes the annual consumption of 230 GWh PCS of natural gas.
The emission factor of natural gas considered is 180 kgCO2/MWh PCS.
The emission factor (scope 1) of bio-methane considered is 0 kgCO2/MWh PCS.

The calculation of the annual reduction of direct CO2 emissions (scope 1) by using bio-methane instead of natural gas, expressed in tonnes of CO2, is :
Annual quantity of energy consumed in GWh x 1000 x (bio-methane emission factor in kgCO2/MWh - natural gas emission factor in kgC02/MWh) / 1000).

So, for the case exposed : $230\,000 \times (0 - 180)/1000 = -41\,400$ tonnes

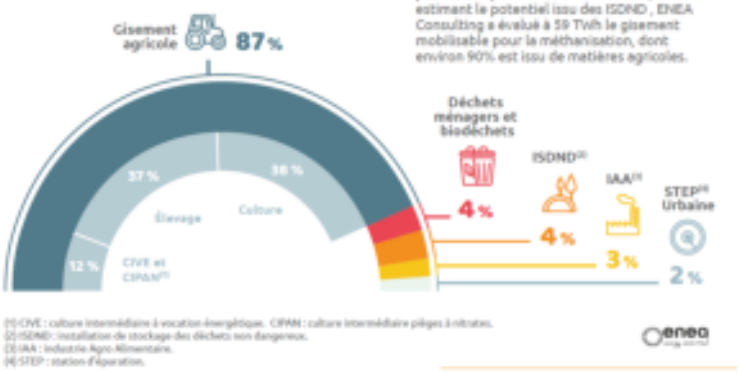
So, the use of bio-methane allows a gain in direct emissions (Scope 1 Solvay) of 41,4 ktCO2 / year

Modality of verification of the quantification	**Calculation standard used (ADEME base, GHG protocol, etc.):** GHG protocol **Verification of the calculation (internal or external):** External in the framework of ETS
Other environmental and social benefits of the project	Established in the territories, the biomethane sector offers positive externalities. In particular, it allows: ● To anchor a circular economy at the local level in waste management. ● To contribute to the development of the local economy providing additional income to farmers. ● To achieve the targets for reducing greenhouse gas emissions set by law of Energy Transition for Green Growth, both in the industrial sector and in the transport (or urban heating).

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**: The development of the bio-methane sector is still at a small-scale commercial stage in France. However, It is already commercialised on a larger scale in other countries such as Germany and the UK.
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	The potential for reproducibility at other Solvay sites in France is significant, especially when electrification of the processes or the switch to biomass is not possible (for technical, economic or resource availability reasons), knowing that SRF (solid recovered fuel) option doesn't bring any CO2 reduction compared to natural gas. An appropriate level of support is necessary for the sector (guaranteed price or other) in order to enable it to reach its objectives in terms of the volume of biomethane injected. Competitive access to guarantees of origin with long-term visibility is essential to make biomethane a sustainable decarbonisation solution for industry. On this point, the terms and conditions of the new mechanism of auction sales of state guarantees of origin auction from 2021 must be specified. The eligibility of biomethane guarantees of origin to substitute natural gas with a zero CO2 emission factor in the ETS must not be reconsidered in order to ensure the longevity (15 years) of our contracts.
Amount of investment made (in €)	The total investment made by Solvay partner producers is estimated at € 60M: ● 15 contracts / projects for an average unit investment of € 4M / project (source: ENEA, October 2017)
Economic profitability of the project (ROI)	☐ ST (0-3 years) ☐ MT (4-10 years) ☒ LT (> 10 years) **Remarks:** Economic interests for Solvay: ● Have a decarbonized steam at an acceptable additional cost (price of guarantees of origin) compared to the steam produced by natural gas. ● Preserve its market shares by meeting the requirements of its main committed customers in efforts to reduce their scope 3 emissions.
Engaged partnerships	Several actors contribute to the successful implementation of these projects : ● Solvay: long-term purchase commitment for bio-methane and guarantees of origin. ● Producer : investment, operation and maintenance of facilities. ● French State : support for the sector through a guaranteed tariff for producers throughout the duration of contracts.
Open comments from the project owner	The use of biomethane is part of a set of energy transition solutions necessary for decarbonisation of industry: photovoltaic or wind power (Clamecy), heat production from of SRF (Dombasle) or biomass (Saint Fons), hydrogen (Tavaux), synergies with the networks of heat (Pont de Claix) etc ... With its One Planet program, Solvay is implementing all of these solutions on French territory.
More about the project	
Contact the company carrying the project	richard.bourdon@solvay.com
Project URL links	/
Illustrations of the project	

Le gisement agricole, principal contributeur de la production de biométhane en 2030

Estimation de la répartition en énergie du potentiel injectable à horizon 2030



En analysant les études de gisement réalisées pour le compte de l'ADEME 8.11 et 8.12, et en estimant le potentiel issu des ISDND, ENEA Consulting a évalué à 59 TWh le gisement mobilisable pour la méthanisation, dont environ 90% est issu de matières agricoles.

(1) CIVE : culture intermédiaire à vocation énergétique. CIPAN : culture intermédiaire pièges à nitrates.
(2) ISDND : installation de stockage des déchets non dangereux.
(3) IAA : industrie Agro-Alimentaire.
(4) STEP : station d'épuration.