

Installation of a tri-generation plant



In order to stop gas consumption on its production site in Lentzweiler (Luxembourg), Tarkett has the project to install by 2024 a tri-generation plant on its site which will stop the incinerator currently used in the production process.

Starting date of the project	2015 : Start of preliminary studies 2018 : Obtaining the operating permit 2024 : Putting into service of tri-generation plant															
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Installation of the biomass plant at the Lentzweiler factory, Luxembourg															
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Reduce GHG emissions at the Lentzweiler site by eliminating the use of gas and stopping the incinerator															
Detailed project description	<p>The project consists in installing a tri-generation plant (capacity 52kt of wood/year) in partnership with Engie close to the Tarkett plant.</p> <ul style="list-style-type: none"> To supply Tarkett with 47GWh/year of energy : <ul style="list-style-type: none"> - Thermal (28 GWh/year for the process and 7.3 GWh/year for heating) - Refrigeration (9.6 GWh/year) Inject 36.3 GWh of electricity into the Luxembourg grid Recover fatal heat (30°C < water < 40°C depending on the season) to produce pellets (41,1 GWh/year) <p>This project is divided into several phases.</p> <p>Phase 1: Currently, the thermal oil used in the production processes is heated by the combustion of gas in two gas in two boilers. The thermal energy, supplied in the form of steam, will be used to heat the thermal oil necessary for the process as well as the heating network of the buildings. It will also allow, thanks to an It will also provide the cold necessary to produce the chilled water required for the process, thanks to an absorption unit. This will reduce emissions by nearly 8400 tCO2 eq (7200 tCO2 eq for Cofely with the transport of the Biomass).</p> <p>Phase 2: Another project related to the biomass installation is the shutdown of the incinerator currently used to burn the fumes from the coating line in order to comply with environmental standards. The incinerator would be replaced by a flue gas condenser. Shutting down the incinerator would result in savings of 12 GWh/year and a reduction in emissions of 2800 t CO2 eq. These 2 joint projects would make it possible to stop consuming gas at the Lentzweiler site.</p>															
Main project's drivers for reducing the greenhouse gas emissions	<table border="1"> <thead> <tr> <th data-bbox="481 1675 979 1704">Reduction levers</th> <th data-bbox="979 1675 1535 1704">Details on the aspects of the project</th> </tr> </thead> <tbody> <tr> <td data-bbox="481 1704 979 1760"> <input type="checkbox"/> Energy and resource efficiency (including behaviour) </td> <td data-bbox="979 1704 1535 1760"></td> </tr> <tr> <td data-bbox="481 1760 979 1834"> <input checked="" type="checkbox"/> Energy Decarbonisation </td> <td data-bbox="979 1760 1535 1834"> Shutdown of the incinerator Replacement of the use of gas by the energy produced by the tri-generation plant </td> </tr> <tr> <td data-bbox="481 1834 979 1863"> <input type="checkbox"/> Energy efficiency improvements </td> <td data-bbox="979 1834 1535 1863"></td> </tr> <tr> <td data-bbox="481 1863 979 1892"> <input type="checkbox"/> Improving efficiency in non-energy resources </td> <td data-bbox="979 1863 1535 1892"></td> </tr> <tr> <td data-bbox="481 1892 979 1944"> <input type="checkbox"/> Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...) </td> <td data-bbox="979 1892 1535 1944"></td> </tr> <tr> <td data-bbox="481 1944 979 1995"> <input type="checkbox"/> Financing low-carbon producers or disinvestment from carbon assets </td> <td data-bbox="979 1944 1535 1995"></td> </tr> </tbody> </table>	Reduction levers	Details on the aspects of the project	<input type="checkbox"/> Energy and resource efficiency (including behaviour)		<input checked="" type="checkbox"/> Energy Decarbonisation	Shutdown of the incinerator Replacement of the use of gas by the energy produced by the tri-generation plant	<input type="checkbox"/> Energy efficiency improvements		<input type="checkbox"/> Improving efficiency in non-energy resources		<input type="checkbox"/> Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)		<input type="checkbox"/> Financing low-carbon producers or disinvestment from carbon assets		
Reduction levers	Details on the aspects of the project															
<input type="checkbox"/> Energy and resource efficiency (including behaviour)																
<input checked="" type="checkbox"/> Energy Decarbonisation	Shutdown of the incinerator Replacement of the use of gas by the energy produced by the tri-generation plant															
<input type="checkbox"/> Energy efficiency improvements																
<input type="checkbox"/> Improving efficiency in non-energy resources																
<input type="checkbox"/> Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)																
<input type="checkbox"/> Financing low-carbon producers or disinvestment from carbon assets																

	<input type="checkbox"/> 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
	Reduction of the company's carbon dependency		
	Scope 1 <i>Direct emissions generated by the company's activity.</i>	Stopping the consumption of gas for heating and production Shutdown of the incinerator	-8.4 ktCO ₂ /year -2.8 ktCO ₂ /year
	Scope 2 <i>Indirect emissions associated with the company's electricity and heat consumption.</i>	Heat (steam) imported from from the trigeneration plant	Marginal (<1 tCO ₂ /year)
	Scope 3 <i>Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.</i>		
	Increase of carbon sinks		
	Emissions Absorption <i>Carbon sinks creation, (BECCS, CCU/S, ...)</i>		
	GHG emissions avoided by the company at third parties		
	Avoided Emissions <i>Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.</i>	Injection of electricity produced from from the trigeneration plant on the Luxembourg grid Luxembourg grid	-14,8 ktCO ₂
	<p>Clarification on the calculation or other remarks</p> <p>The Lentzweiler site consumed 47 GWh PCI of gas per year before the project was launched. Considering an average EF of 239 kgCO₂/MWh PCI, this represented nearly 11.2 ktCO₂/year.</p> <p>The cessation of gas consumption for heating and production lines (thermal oil production) as well as the production lines (thermal oil production) as well as the shutdown of the incinerator will enable the site to completely eliminate its gas consumption.</p> <p>Phase 1 of the project, which consists of replacing the energy produced by the two gas boilers with the tri-generation plant will reduce gas consumption by 28 GWh PCI/year for the process part and 7.3 GWh PCI/year for the heating part. We can therefore consider a total saving thanks to phase 1 of the project of about 8.4 ktCO₂/year.</p> <p>Phase 2 aims at stopping the incinerator and the associated gas consumption (12 GWh PCI/year). This is equivalent to to a reduction of emissions of about 2.8 tCO₂eq/year (it is considered that the condenser does not smoke does not lead to GHG emissions).</p> <p>Phases 1 and 2 therefore reduce emissions by 11.2 tCO₂eq/year. The energy required for the site's uses is now produced by the tri-generation plant. The emission factor of this heat is very low compared to that of natural gas. The production of the 47GWh (from the tri-generation plant) therefore leads to estimated marginal CO₂ emissions (<1 tCO₂/year). The tri-generation plant allows the production of 36,3 GWh/year injected in the Luxembourg grid. In considering that the emission factor of the electricity of the Luxembourg grid is 410 kgCO₂/MWh (Ademe carbon base). This makes it possible to avoid nearly 14.8 ktCO₂/year.</p>		

Modality of verification of the quantification.	Calculation standard used (ADEME base, GHG protocol, etc.): Use of the conversion factor from the Ministry of Economy of Luxembourg.	
	Verification of the calculation (internal or external): internal verification by the Group	

Other environmental and social benefits of the project	<p>This project brings other benefits:</p> <ul style="list-style-type: none"> • Creation of 10 jobs in the biomass plant • Creation of 15 jobs for the pellet plant • The wood used (shrubbery, roadside clearing, forestry pellets) will come from a radius of of 200km maximum around the plant
Project maturity level	<p> <input type="checkbox"/> Prototype laboratory test (TRL 7) <input type="checkbox"/> Real life testing (TRL 7-8) <input type="checkbox"/> Pre-commercial prototype (TRL 9) <input checked="" type="checkbox"/> Small-scale implementation <input type="checkbox"/> Medium to large scale implementation </p> <p>Remarks: COMODO (authorization to operate) granted in December 2018</p>
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	Particular economic set-up with a direct link to Luxembourg aid for this type of project
Amount of investment made (in €)	Total investment of about 40 to 50 m€, partly financed by state subsidies Luxembourg government.
Economic profitability of the project (ROI)	<p> <input type="checkbox"/> ST (0-3 years) <input checked="" type="checkbox"/> MT (4-10 years) <input type="checkbox"/> LT (> 10 years) </p> <p>Remarks: This project allows Tarkett : <ul style="list-style-type: none"> • Avoid a significant part of the new carbon tax in Luxembourg • To make a significant saving on gas expenses </p>
Engaged partnerships	A long-term commitment contract has been signed with Engie
Open comments from the project owner	/
More about the project	
Contact the company carrying the project	communication@tarkett.com
Project URL links	/
Illustrations of the project	<p>The diagram illustrates the project's energy and material flow. On the left, biomass (wood chips) is processed by Biogie S.A. into pellets. This process involves a 'Sécher' (drying) and 'Générateur' (generator) stage. The generator produces 'Energie fatale' (waste heat), which is captured and used in a 'Process' unit (Tarkett) and an 'Absorption chiller'. The chiller provides 'Chauffage bâtiments' (building heating). The pellets are then processed by Biogie Pellets S.A. into finished pellets. The diagram also shows a connection to 'Production d'électricité' (electricity production) via 'enovos'.</p>