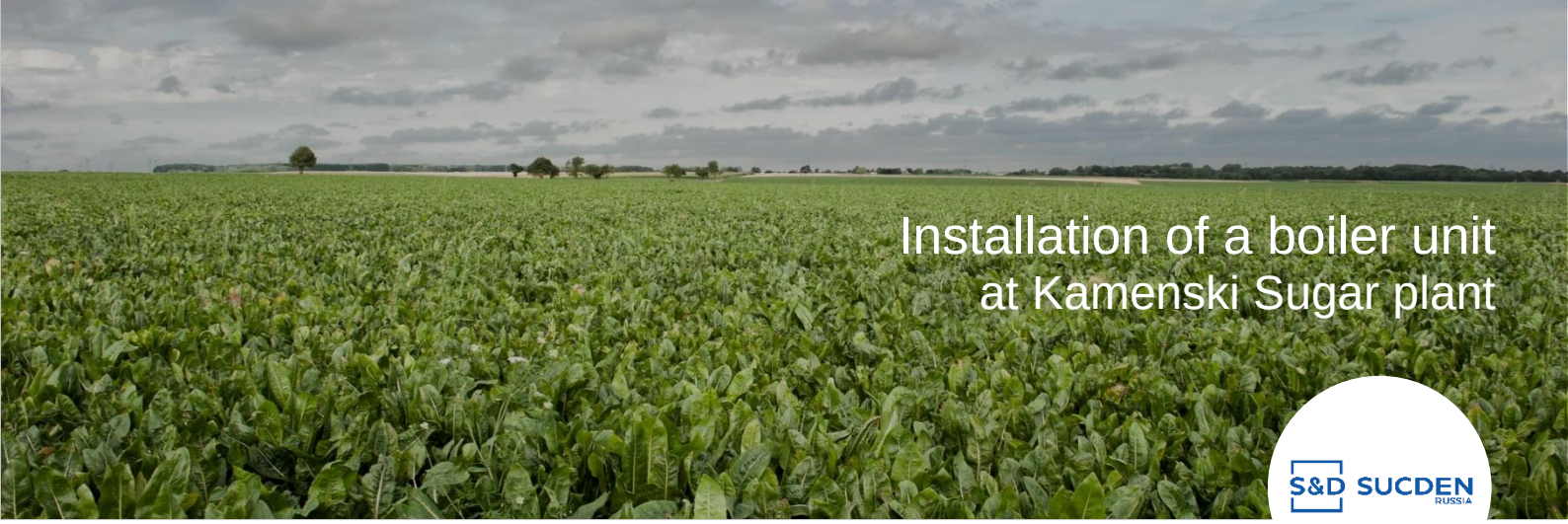
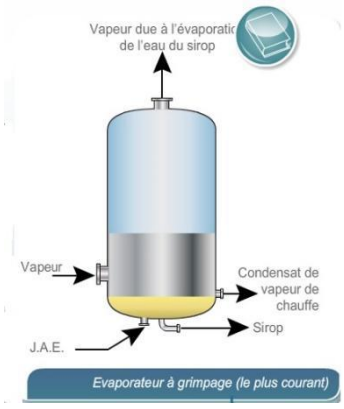


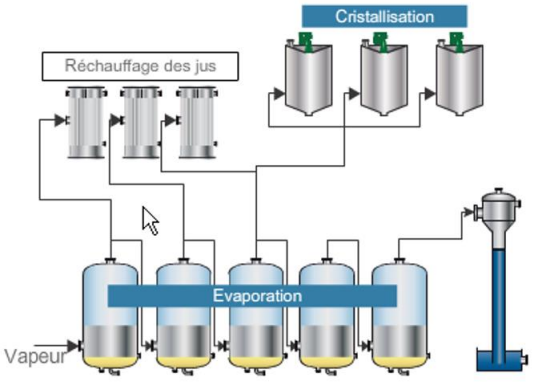
Installation of a boiler unit at Kamenski Sugar plant

Sucden optimizes industrial processes – installation of a boiler unit – in a sugar plant in Russia to reduce gas consumption and environmental footprint.

Starting date of the project	**2020**: launch of the project, preliminary studies **November 2020:** Investment decision **March 2021:** Project realization **August 2021:** start of operations for the new sugar beet campaign
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	Kamenski sugar plant, Kamenka, Oblast of Penza, Russia (about 600 km southeast of Moscow). This installation may be replicated in the other sugar plants within Sucden Group.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	This project aims at reducing GHG emissions of the sugar plant by reducing gas consumed in the industrial process.
Detailed project description	**The success of this project requires the installation of a new boiler unit. It will imply a change in the input of products at the key stage of crystallization.** **<u>Evaporation in sugar plants has two main functions:</u>** 1. It provides low pressured steam in different parts of the sugar plants depending on thermal level (pressure/temperature) from 130° to 90°C. This steam results from the electricity in turbo generator. 2. It condenses the sugar beet juice from 17.5% up to 68-72% of dry matter (syrup). Mass of the syrup resulting from evaporation is then only about 25% of the incoming juice, which is done in 5 steps or evaporation phases. **<u>General principle:</u>** The juice is heated until boiling. Water steam produced is reintegrated to feed other equipment in the factory, and juice is getting more condensed (syrup). 

In a single evaporator system, the steam produced by the juice boiling is not reused. For each kg of evaporated water, there must be provided 1 kg of steam heating. This process generates GHG emissions that could be avoided, and this is the reason why we looked for improvements.

Multiple evaporator system enables a bigger evaporation of water with the same amount of initial steam. In this system, 1 kg of steam input in the 1st stage evaporates 1 kg of juice. This same kg of water also evaporates 1 kg of water in the next stage and so on.



Exemple de principe de prélèvements

To allow reduction of steam consumption in a sugar plant through a multiple evaporator system, the global output of evaporated water must remain below each level to keep positive savings of energy and GHG emissions.

Specific case of Kamenski plant:

1. At Kamenski sugar plant, evaporation at the 4th stage was poor after the recent increase of the plant production capacity. This resulted in an accrued consumption of energy and GHG emission for the 3rd evaporation stage.

2. The boiler unit added in Kamenski aims at increasing the evaporation capacity of the 4th stage to get a warmer steam and thus reduce the use of steam produced from gas consumption.

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	The project will cut gas consumption by 1m3 for each ton a sugar beet.
☐ 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.*	The project will cut gas consumption by 1m3 for each ton of sugar beet processed.	-1.9ktCO2eq/an
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:

This investment will reduce GHG emission by reducing the gas consumption by 1m3 per ton of sugar beet processed.

In 2020, the plant produced 102,918t of CO2 for 955,756 tons of beet processed.
Given that 1m3 of gas represents 1.9885 kg of CO2 emissions (1m3/year x 0.0097 MWh PCI/m3 * 205kg CO2/MWh PCI = 1.9885 kq CO2 eq).

In 2021, a comparable volume of beet processed would avoid 1,900 tons CO2, i.e a reduction of 1.8%.

1 m3/tb*900,000 tb*5.65 rubles/m3 = 5,000,000 RUB/year of savings

Modality of verification of the quantification.	**Calculation standard used (ADEME base, GHG protocol, etc.):** GHG Protocol **Verification of the calculation (internal or external):** Energy consumption and GHG emissions of Sucden sugar plants, including Kamenski plant, are verified by external auditor as part of the Group annual Responsibility report verification.
Other environmental and social benefits of the project	The project will contribute to ODD 9 – Build resilient infrastructure, promote sustainable industrialization and foster innovation : the industrial process will be optimized to reduce environmental footprint.
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
Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential	This type of projects can be realized in all the plants of the Group.
Amount of investment made (in €)	400 000 €
Economic profitability of the project (ROI)	☐ ST (0-3 years) ☒ MT (4-10 years) ☐ LT (> 10 years) **Remarks:** The savings of 1m3 of gaz / ton of beet represent, for a similar production as 2020, a savings of 5 millions of rubles per year (i.e 55,500 €).
Engaged partnerships	/
Open comments from the project owner	/
More about the project	
Contact the company carrying the project	sustainability@sucden.com
Project URL links	/

Illustrations of the project