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Advancing resource efficient and cleaner production in Georgia

-The RECP methodology-

Resource Efficient and Cleaner Production (RECP) is the integrated and continuous application of preventive environmental strategies to **processes, products, and services** to increase efficiency and reduce risks to humans and the environment. RECP is all about producing with fewer resources while minimizing environmental impacts and increasing overall productivity. For **Small and Medium-sized Enterprises (SMEs)**, the RECP methodology is an effective instrument to lower production costs whilst improving the SMEs' competitive advantage and applying environmentally friendly practices.

QARTULI FERMA -Dairy production-

Company overview

Address: Tbilisi

Key products: dairy products: sour cream, cottage cheese, yogurt (matsoni), milk

No. employees: 11

Main markets: Georgia (local markets)

Founding year: 1994

Management systems: under the Department of Food Safety (the National Food Agency under the Ministry of Environmental Protection and Agriculture in Georgia)



"Qartuli Ferma" is a small, Tbilisi based company, that produces 194.4 tonnes of dairy products per year. For its production facility, the company requires an important use of energy sources for heat exchange (pasteurization, cleaning, and raw materials preparation) and electricity (cooling, packaging, and general production lines). Water is also crucial for the cleaning and proper compliance with food safety standards, as well as for heat generation. Materials wise, the milk processing generates important organic load (leakages and leftovers) that, if discharged in the wastewater stream, damages the natural environment. To respond to these challenges, "Qartuli Ferma" was encouraged to adopt the RECP methodology to improve its use of resources (leading cost reduction and better environmental stewardship) as the potential return for adopting resource efficiency strategies in the dairy sector is high and directly affects competitiveness, social acceptability, and environmental compliance. The company also joined EaP GREEN in 2015 as a demonstration company, being motivated to reduce its energy consumption and improve environmental and technical performance.

Benefits

- Implementation of 3 RECP options (focused on energy efficiency)
- Required investment payback period of less than one year
- Reduction of water consumption per tonne of product: 40%
- Reduction of thermal energy consumption per tonne of product: 14%
- Reduction of electricity consumption per tonne of product: 29%
- Energy savings that generated a reduction of 4.75 tonnes of CO₂eq/year

Action implemented by:



The project's approach

As part of the technical assistance provided under EaP GREEN (training programme creating RECP capacity), the "Qartuli Ferma" team was able to follow a systematic approach to develop a RECP action plan and gained knowledge to introduce RECP as a continuous improvement cycle. The RECP assessment examined the production site, and identified three options to improve the efficiency of the plant's resource usage. Some were no-cost, or low-cost measures, while the other required considerable investments:

RECP option 1. Insulating the surface of the steam boiler. The benefits of isolating hot surfaces are sometimes overlooked. All non-planned transfers of heating generated through energy sources should be avoided as they generate unnecessary fuel or electricity demand. The company's boiler was old and with handcrafted-sections that facilitated heat losses throughout the whole cover of the equipment. A simple investment in isolation material brought a 5,6 % reduction of natural gas consumption.

RECP option 2. Installing an additional tank for the cooling water circulation. The cooling water was partially discharged with no additional use. The cooling water used to be treated in streams that could be reused through a closed-circuit installation (reducing thus, the replenishment water and improving the efficiency of the cooling system). The company opted for a closed-circuit and installed an additional 3 tonnes tank for the circulation of the cooling water.

RECP option 3. Replacement of the electric water heater with an heat exchanger. Sanitary hot water was generated through an electric heater, with residual heat being lost from the wasted hot serum (whey at 90° C). As the company implemented a recovery system based on a heat exchanger, now, the system is used for energy recovery. The heat exchanger can fully substitute the electric water heater. Moreover, part of energy recovered through the heat exchanger can also preheat the feed water used in the steam boiler. This reduces the amount of natural gas used for steam generation.

Saving achievements

MAIN IMPLEMENTED ACTIONS

- Option 1:** Insulating the surface of the steam boiler
- Option 2:** Installing an additional tank for the cooling water circulation
- Option 3:** Replacement of the electric water heater with an heat exchanger



ECONOMIC KEY FIGURES

	Investment (Euro)	Saving (Euro/year)	PBP (years)
Option 1:	85	219	0.4
Option 2:	490	1,371	0.4
Option 3:	200	1,151	0.2
Total:	775	2,741	-



Company insight

In 2017, the company took a loan from the TBC Bank to buy out the land plot where the enterprise is located. Currently four more years are needed to repay the loan.

In the past, there had been a testing trial to produce other cheeses, but at that stage, it turned out unprofitable. In the future, as the company plans to extend its production line, all efficiency improvements will help it innovate its current and new products.

*Our company had big energy and water consumptions, so we were looking for advice on how we could better use these resources in a rational and efficient way. The results exceeded our expectations, as the implementation of RECP measures led to a decreased energy and water usage, and a significant reduction of waste, said **Roman Ishkhneli, Chief Engineer***

RESOURCE SAVINGS

	Water (m ³ /year)	Energy (kWh/year)	Fuel (natural gas) (m ³ /year)
Option 1:	-	7,200	735
Option 2:	810	-	-
Option 3:	-	21,513*	1,109
Total:	810	28,713	1,844

*10,646 kWh (electricity)+10,867 kWh (natural gas)

TOTAL POLLUTION REDUCTION

	CO ₂ -eq (t/year)	Wastewater (m ³ /year)
Total:	4,756	810



The introduction of RECP has been part of the EU-funded programmes: **EaP GREEN** (2013-2017) and **EU4Environment Action** (2019-2022) executed by UNIDO. In this context, "Qartuli Ferma" joined the RECP training and assistance programme under EaP GREEN, and was monitored under EU4Environment. Follow-up visits have also been conducted under EU4Environment, to check on the implemented RECP options after the EaP GREEN Programme ended. EU4Environment helps the six EaP partner countries preserve their natural capital and increase people's environmental well-being by supporting environment-related action, demonstrating and unlocking opportunities for greener growth, and setting mechanisms to better manage environmental risks and impacts. For more details, visit:

www.eu4environment.org



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