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Advancing resource efficient and cleaner production in Armenia

-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. As well, RECP is considered an effective tool to introduce and promote Circular Economy principles among SMEs.

GALIK LLC

- Limestone production company -

Company overview

Address: 5 Shahumyan str., Ararat, Ararat Marz, Armenia
Key products: limestone (CaCO_3), hydrated lime (Ca(OH)_2), calcium oxide/burnt lime (CaO),
No. employees: 82 (58 women and 24 men)
Main markets: Armenia
Founding year: 1997



Initially operating as a subordinate unit of a cement plant, "GALIK LLC" now functions as a full-fledged lime producer in the Ararat region. It mainly produces lime (with more than 90% being used in metallurgy and mining, at around 1,100-1,200 tonnes per month). "Lime" refers to both limestone (CaCO_3) and its derivatives: "burnt lime" (CaO) and "hydrated lime" (Ca(OH)_2). The limestone is obtained in semi-prepared conditions through field stoves. The company's laboratory ensures the quality of the finished products and the main production process at all stages: the splitting of raw material, sorting, roasting, primary crushing, and crushing. The resulting raw material is a specific limestone with high purity and homogeneity. Motivated to achieve a more energy-efficient production, the company participated in the RECP demonstration project under EaP GREEN (2013-2017). This publication shows the company's experience reported after the monitoring exercise conducted in 2021, four years after the programme ended.

Benefits

- Implementation of 5 RECP options
- Reduction of electricity costs by 2% per tonne of produced lime
- Reduction of natural gas consumption by 25%
- Reduction of 55 tonnes of CO_2 emissions per year
- Reduction of 110 tonnes of material loss per year

Action implemented by:



The project's approach

The RECP assessment examined the production site and identified 9 RECP options, out of which 5 were implemented. As the energy needed to produce lime represents more than 20% of the product costs, and, considering its important emission contribution, the company focused on energy efficiency as a first priority area; the following five options were implemented:

RECP option 1. Equipment modification. The electricity costs were reduced by installing optimal equipment and using variable speed drives (VSD) to the powerful motors running in the mine. The use of VSD allowed the controlling speed and torque to precisely match the load to the real demand, reducing power, stress on the system components, heat losses, all while improving safety by accurately controlling the pressure and temperature.

RECP option 2. Installation of efficient gas burners in the existing stoves and better control of gas consumption. The old gas burners were replaced with new ones, adjusted to the stoves' real capacity. This reduced losses previously caused by inefficiencies and incorrect design. Gas meters were also installed to allow for improved monitoring and control. The change ensured the reduction of natural gas consumption by 25%.

RECP option 3. Replacement of inefficient lighting. The incandescent and fluorescent bulbs were replaced with energy-efficient LED lights (both externally and internally).

RECP option 4. Replacement of windows and doors. The former fenestration was updated to enhance isolation and reduce heat exchange, improving the overall energy efficiency of the plant.

RECP option 5. Improved coordination in the production planning based on detailed market analysis and an improved production data system. The capacity has been established to perform this activity on a continuous basis.

Saving achievements

Other opportunities

MAIN IMPLEMENTED ACTIONS

5 RECP options were implemented by the company staff at the end of the monitoring report.

ECONOMIC KEY FIGURES

	Investment (Euro)	Saving (Euro/year)	Payback period (years)
5 RECP options:	18,050	16,181	1.1

RESOURCE SAVINGS

	Energy (kWh/year)	Materials (t/year)	CO ₂ (t/year)
5 RECP options:	261,530	110	55.2



The company is interested in optimizing its use of natural resources, seeking an efficient exploitation, and the minimization of the negative impact of its mining and production systems on the environment. Alongside the good progress in energy optimization, "GALIK" LLC has now an interest in the efficient use of materials, and the reduction of emissions and pollution (as further RECP interventions). The company started implementing RECP in 2016. Amongst others, the monitoring visits also identified the installation of PV panels as an additional RECP measure. As a next step, the installation of an on-grid solar system is recommended to achieve the reduction of GHG emissions. A system with a nominal capacity of 500 kWp can generate 725,894 kWh/year of electricity, with a cost saving potential of 40,014 Euro/year, and a payback period of approximately 6 years. This would also lead to an annual reduction of electricity from the grid of 89%.

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, GALIK LLC 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 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



Contact:
REC Caucasus Armenia National Office
Aygestan str. 7, building N 2, 0070, Yerevan
Web: www.recp.am
Tel: +374-115-75-148

