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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.

ELBAT CJSC

-Manufacture of batteries and accumulators for vehicles-

Company overview

Address: 37/29 Sharuri str., 0043, Yerevan
Key products: Wide range of vehicle batteries
No. employees: 52
Main markets: Armenia
Export quota (%): N/A
Founding year: 2007
Certification: ISO 14001:2004, ISO 9001:2008



"ELBAT" CJSC is a leading producer of high-quality lead-acid batteries. The company offers a wide range of batteries for cars and commercial vehicles between 40-100 A/H and 120-200 A/H, and provides technical services to select the best battery option for its clients. The enterprise's annual production is around 15,000 batteries. Motivated to improve its environmental performance and optimize its resource usage (materials, water, energy) the company joined EaP GREEN in 2017. The programme was in line with ELBAT's environmental management system (EMS), whose objectives include minimizing the negative impact of the production systems on the environment, and mitigating risks to people. Thanks to EaP GREEN, RECP is now a well-understood concept within ELBAT, and it is used to improve the company's performance, part of its EMS. This publication shows the company's experience reported after the monitoring exercise conducted in 2021, four years after the programme ended.

*Following the project's suggestions, among others, we decided to reuse the hot water which resulted from the battery production. By upgrading the cooling system to recover water and heat, we have been able to cut costs and save the water that had been previously flushed into the sewage, said **Ashot Papyan, Production Line Manager***

Benefits

- Implementation of 5/7 RECP options (plus housekeeping rules to improve general energy efficiency)
- Total economic savings of 81,550 EUR/year
- General payback period of 2.5 years
- Reduction of resource consumption per battery unit: Electricity: 2 % | Natural gas: 4 % | Water: 16 %
- Reduction of waste generation per battery unit of lead: 11 %
- Emission reduction of 10 tonnes of CO₂ -eq/year
- Improved occupational health and safety measures (due to better energy and waste management)
- Contribution to better environmental performance (framework of ELBAT's EMS)

Action implemented by:

The project's approach

The RECP assessment examined the production site, and identified several good housekeeping practices and 7 options, which were then distributed and adopted in three blocks:

RECP option 1. More efficient and effective energy use. The company conducted a combined plan to reduce natural gas and electricity consumption. By repairing the thermal pipeline network, conducting a regular control of the combustion process in the lead smelting ovens, optimizing the heated surfaces of the production process, and recovering heat waste from the hot water supply, it achieved natural gas savings. On the electricity side, reducing idle times, adjusting lighting to the light demand and workstation conditions, using LED lamps, and reusing cooling water, all generated important energy savings.

RECP option 2. Water reuse options. Water streams from the cooling system of accumulators have been recovered through a close water cycle, saving water volume and energy by reducing needs of energy for heat exchange.

RECP option 3. Reduction of material and waste generation. Plastic waste (such as polyethylene, which was gathered from the accumulators packaging) was recovered and sold for recycling. Considering the company's commitment to reduce hazardous wastes, the most significant change was to introduce a lead recovery system that facilitated the extraction of lead from the sludge and pastes discarded from the operations, and its return to the production cycle. As a result, every year, 60 tons of lead are reutilized either in the production process or sold to external users.

Saving achievements

MAIN IMPLEMENTED ACTIONS

Option 1: More efficient and effective energy use

Option 2: Water reuse options

Option 3: Reduction of material and waste generation



ECONOMIC KEY FIGURES

	Investment (Euro)	Saving (Euro/year)
Option 1:	10,000	2,050
Option 2:	12,000	4,500
Option 3:	180,000	75,000
Total:	202,000	81,550



RESOURCE SAVINGS

	Water (m ³ /year)	Material (t/year)	Waste (t/year)	Energy (kWh/year)
Option 1:	-	-	-	32,000
Option 2:	1,500	-	-	-
Option 3:	-	2	60	-
Total:	1,500	2	60	32,000



Other Opportunities

The company will seek to implement the proposed RECP measures that were part of the earlier assessment. Options like installing an infrared heating and high-efficient transformers need a more comprehensive analysis to confirm their economic and environmental feasibility. On the other hand, thanks to the monitor exercise, the opportunity to install a PV solar system with a nominal capacity of 500 kWp is under evaluation. The annual cost saving potential would be of 38,000 EUR/year, reducing, thus, the grid electricity by 61 %. Investment in this technology is not a quick return in Armenia, with payback periods being of approximately seven years. However, it ensures access to a renewable source for at least 20 years. The company is to consider these measures for future action, as it is also working on its environmental management system (EMS), for which RECP has been incorporated as a regular tool to improve environmental performance.

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, "ELBAT" CJSC 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