MOVING FORWARD TOGETHER

THIS PROJECT IS FUNDED BY THE EUROPEAN UNION

EU4Environment
Green Economy in Eastern Partner Countries

Advancing resource efficient and cleaner production in Ukraine

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 can effectively lower production costs whilst improving the SMEs' competitive advantage and applying environmentally friendly practices. RECP is also an effective tool to introduce and promote Circular Economy principles among SMEs.

SMNPO-ENGINEERING JSC - METALLURGICAL INDUSTRY

Company overview

FRUNZE
АТ " СМНВО - Інжиніринг"

Location: Sumy
No. of employees: 3,500
Key products: equipment for oil, gas, nuclear, and chemical industries
Main markets: Ukraine, Europe, Asia, Africa, USA
Exportation quota (%): 70
Founding year: 1896
Certifications: ISO 9001, OHSAS 18001, ISO 14001

SMNPO-Engineering, JSC (Sumy Machine-Building Science and Production Association) is an engineering complex that provides technical support for industries, and manufactures various products (compressors and gas compressor units, chemical equipment, centrifuges, pumps and gas pipeline valves, oilfield equipment and gas filling stations, integrated gas treatment units, and so on). The company has its own metallurgical, partial manufacturing, welding, and mechanical assembly units. Motivated to improve its products' quality, increase resource efficiency, and reduce its environmental impact, the company participated in the RECP Demonstration Project under EU4Environment (2019-2024). This publication shows the its experience reported after the monitoring exercise was completed in 2023.

> “We joined the project to identify problem areas in our production. The RECP Demonstration Project helped demonstrate the importance of resource accounting, not only at the plant and shop levels, but also on site. In the future, our company intends to regularly raise the awareness of employees about the efficient consumption of resources and the implementation of RECP measures. We are grateful to the RECPC experts for their professionalism, and for sharing their experience and knowledge, said the leading energy manager of SMNPO-Engineering, JSC, Ms. Yuliia Laskava.”

BENEFITS

1. 10 RECP options (focused on resource efficiency)
2. Reduction of electricity consumption by 475,156 kWh per year
3. Reduction of wastewater by 9,808 m^3 per year
4. Reduction of 600 tonnes of CO_2 -eq per year

The project's approach

The RECP assessment examined the production site and identified several RECP options, out of which ten were prioritised, with the following four being described below:

RECP Option 1. Reducing the moulding sand loss: This consists of rearranging the intermediate storage for dry sand by bringing it closer to the mixing machine. This way, the direction and length of the conveyor belt of the machine is reduced from 200 m to 25 m, thus reducing sand loss by about 80 tonnes per year.

RECP Option 4. Improving the design of the gating system: Improving the design would help reduce metal consumption during the processes of modelling, pouring, and crystallisation of metals.

RECP Option 7. Modernising the ladle heating process: Using specialised burners for the heating stopper and lip-pour ladles with specialised lids would heat up the ladles to the needed temperature. This would significantly reduce the amount of gas needed for heating.

RECP Option 9. Creating heat-insulated, closed chambers for the furnace: Installing closed chambers would help heat the valves and pumps of the furnace's cooling system and reduce gas consumption, as the chambers would be electrically-heated.

SAVING ACHIEVEMENTS

Main RECP actions

OPTION 1	Reducing the moulding sand loss
OPTION 2	Optimising the mould's size for sand casting
OPTION 3	Regenerating the moulding mixture
OPTION 4	Improving the design of the gating system
OPTION 5	Increasing the utilisation rate of metal
OPTION 6	Controlling the total water consumption
OPTION 7	Modernising the ladle heating process
OPTION 8	Rearranging the heated areas for staff (implemented measure)
OPTION 9	Creating heat-insulated, closed chambers for the furnace (implemented measure)
OPTION 10	Modernising the lightning system (partly implemented measure)

Economic key figures

RECP OPTIONS	INVESTMENT (EUR)	SAVINGS (EUR/YR)	PAYBACK PERIOD (YR)
Option 1:	758	6,165	0.13
Option 2:	1,600	10,597	0.15
Option 3:	59,153	8,331	6.2
Option 4:	15,000	16,750	0.9
Option 5:	/	46,899	/
Option 6:	1,536	6,130	0.3
Option 7:	2,100	1,628	1.3
Option 8:	8,356	42,307.5	0.2
Option 9:	781	42,323	0.1
Option 10:	21,840	19,894	0.86

Resource savings

RECP OPTIONS	ELECTRICITY (KWH/YR)/%	NATURAL GAS (M^3/YR)/%	WATER (M^3/YR)/%	MATERIALS (T/YR)/%
Option 1:	55,000/2.3	/	/	80/4.5
Option 2:	8,066/0.3	/	/	218/12
Option 3:	-172,400/7.3	-31,076/9.8	/	1,465/85
Option 4:	91,451/3.9	5,514/1.7	/	32/5
Option 5:	256,063/10.8	15,438/4.5	/	89/14
Option 6:	/	/	9,808/82	/
Option 7:	/	3,727/1.2	/	/
Option 8:	-4,032/0.2	97,591/30.8	/	/
Option 9:	-3,840/0.2	97,591/30.8	/	/
Option 10:	244,848/10.3	/	/	/

Total pollution reduction

RECP OPTIONS	TOTAL CO_2-EQ (TONNES/YR)	WASTEWATER (M^3/YR)	WASTE (TONNES/YR)
Total:	600	9,808	1,763

The introduction of RECP has been part of the EU-funded EU4Environment Action and executed by UNIDO. In this context, **SMNPO-Engineering, JSC** joined the RECP Demonstration Project to be monitored under EU4Environment. Follow-up visits have also been conducted to check on the implementation of the recommended RECP options. EU4Environment helps the EU's Eastern Partnership 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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