



Energy Efficiency Program for 2020–2023

Moscow | 2020

*Appendix No. 1
to the minutes of meeting of
the Committee for sustainable development
of PhosAgro PJSC Board of Directors
dated 26.08.2020, w/o No.*

Table of contents

Objectives of Energy Efficiency Program	3
Stages of Energy Efficiency Program	4
Plan of actions under Energy Efficiency Program, Balakovo	5
Plan of actions under Energy Efficiency Program, Volkhov	6
Plan of actions under Energy Efficiency Program, Kirovsk	7
Plan of actions under Energy Efficiency Program, Cherepovets	8
Plan of Energy Efficiency Program actions approval	10

Objectives of Energy Efficiency Program

Strategic Objectives of Energy Efficiency Program	Desired outcome
1) Strategic vision related to improvement of energy resources consumption efficiency in the Company and reasonable objectives setting.	Reduction of costs for energy resources and production cost reduction.
2) Careful attitude to natural resources and reduction of primary resources consumption, including water resources.	Reduction of ecological footprint of the company (emission of pollutants and greenhouse gases).
3) Development of consumption and in-house generation of renewable energy (RES).	Reduction of ecological footprint of the company (emission of pollutants and greenhouse gases).
4) Improvement of efficient control of greenhouse gasses emission reduction (scope 1 + scope 2).	Reduction of hydrocarbon footprint of the Company (GHG emission).
5) Improvement of reporting quality, transparency of the Company activity and value creation during cooperation with the stakeholders (consumers, investors, NGO, etc.)	Enhancement of positions in ESG ratings, improvement of Company image as a responsible member of society. Development of reporting in CDP, TCFD formats, its compliance with the requirements of European Green Deal, and development of mechanism to manage transboundary carbon tax influence.
6) Compliance with legislative and other requirements, including voluntary obligations (e.g., UN SDGs, ISO 50001).	Confident and sustainable activity, providing the improvement of Company's positions in international ESG ratings.

Stages of Energy Efficiency Program

Stage	Term	Status
1. Development of Energy Efficiency Program principles	July 2020	Completed
2. Development of the list of projects for implementation under Energy Efficiency Program.	July 2020	Completed
3. Program approval at Board of Directors' Sustainable Development Committee.	August 2020	Completed
4. Implementation of earlier approved projects, included to Energy Efficiency Program for 2020.	During 2020	Under implementation
5. Preparation of materials for the projects included to Energy Efficiency Program for 2021–2023.	August 2020 – January 2021	Under implementation
6. Monitoring and tracing of the results of Energy Efficiency Program implementation.	On the meetings of Board of Directors' Committee for Sustainable Development	Under implementation

Plan of actions under Energy Efficiency Program, Balakovo

	Target value / action	Status	Term of implementation	Effect
1.1	Development of own electrical generation in Balakovo Branch of Apatit JSC.	PDW are carried out, project consideration for ITS in Oct. 2020	Q2 2022	Substitution of purchased electric energy.
1.2	Installation of condensate traps in the phosphoric acid production hot-air heating network with arrangement of condensate collection network.	Initial data are provided, clarification of implementation results monitoring procedure is required.	Q4 2021	Reduction of steam consumption by the phosphoric acid production hot-air heating system.
1.3	Installation of frequency converters on the pumps of chemically treated water of water treatment plant.	Initial data are provided, clarification of implementation results monitoring procedure is required.	Q4 2021	- Reduction of electric energy consumption; - reduction of water treatment plant operator task time; - improvement of level controllers operating conditions in deaerators.
1.4	SP ceiling lighting transfer to LED.	Initial data are provided, clarification of implementation results monitoring procedure is required.	Q4 2020	Reduction of operating costs for electric energy, MRO and reduction of distribution networks loading.
1.5	25 MW recovery turbine installation in BB of Apatit JSC.	Under materials preparation for ITS, the selection of contractor for main technical solutions elaboration is carried out.	Q4 2020	Generation of additional electrical energy.
1.6	Solar electric plant installation at BB of Apatit JSC, capacity 40 kW.	Engineering, survey	Q4 2020	Replacement of purchased electric energy with alternative source (solar battery).

Plan of actions under Energy Efficiency Program, Volkhov

	Target value / action	Status	Term of implementation	Effect
2.1	Reconstruction of steam pipeline of Sulphuric acid production 4.0 MPa with the replacement of thermal insulation and heat-insulation of the reinforcing bars.	Initial data are not provided Clarification of further monitoring procedure for the implementation results is required.	2021	Heating energy saving.
2.2	Reconstruction of lighting on granulated sulphur warehouse with the installation of LED light fixtures.	Initial data are not provided Clarification of further monitoring procedure for the implementation results is required.	2020	Economic effect, reduction of electric energy consumption.
2.3	Implementation of alternative energy sources. Installation of solar power plant with capacity of 120 kW.	Initial data are not provided Clarification of further monitoring procedure for the implementation results is required.	2021	Replacement of purchased electric energy with alternative source (solar battery).
2.4	25 MW recovery turbine installation.	Engineering + installation work.	Q2 2021	Cost savings related to electric energy purchasing from guaranteeing supplier.
2.5	Construction of water treatment plant.	Engineering + installation work.	Q2 2021	

Plan of actions under Energy Efficiency Program, Kirovsk

	Target value / action	Status	Term of implementation	Effect
3.1	Transfer of KFA subdivisions for LED lighting.	Elaboration.	2021–2022	Reduction of electric energy annual consumption, reduction of MRO costs.
3.2	Rasvumchorr Mine. Reconstruction of VTs-32, replacement of heaters contactor control circuit with UTUK thyristor control.	Project is implemented.	2021–2022	Reduction of operational cost.
3.3	Reconstruction of drying drum sections (7 pcs) with thermal insulation arrangement.	(RD available)	2021–2022	Reduction in heat losses, reduction of fuel oil specific consumption.
3.4.	Retrofitting of draft units of boiler house of ANOF-3 (of the concentrator plant).	(RD available)	2021–2022	Reduction of process failures and shutdowns of boiler units, heating energy curtailment to ANOF-3 and consumers.
3.5	Reconstruction of compressor station of Rasvumchorr Mine.	Preparation of SoW for turn-key work performance according to developed documentation.	Decision about project launching transfer to 2021	Reduction of generated resource cost and determination of the most effective reconstruction option.
3.6	Reconstruction of compressor station of Consolidated Kirovsk Mine.	Preparation of material for ITS review.		Reduction of generated resource cost and determination of the most effective reconstruction option.
3.7	Transferring ANOF-3 of KF of Apatit JSC facilities to LED lighting with consumption reduction.	Completed.	-	Reduction of energy consumption.

Plan of actions under Energy Efficiency Program, Cherepovets

	Target value / action	Status	Term of implementation	Effect
4.1	Recycling of unused steam 13 atm from nitric acid units of Nitrogen Complex.	B plan for FEED stage adopted, engineering is carried out.	2020–2022	Substitution of purchased electric energy, condensate return, excess steam complete recovery.
4.2	Construction of steam turbine at the Phosphor Complex.	Initial data to be clarified.	2021–2023	Substitution of purchased electricity, arrangement of steam supply to 13 eti of the Phosphor Complex from the installed turbine recovery in the amount of 60–90 t/h.
4.3	Pump station modernization (frequency converters and control system installation).	Expert evaluation of energy resources consumption is provided, clarification is required.	by decision of ITS	Reduction of electric energy annual consumption.
4.4	Installation of flow meters (metering units) on all consumers of service potable water.	Expert evaluation of energy resources consumption is provided, clarification is required.	by decision of ITS	Reduction of annual consumption of PKhV on AK and PC.

Plan of actions under Energy Efficiency Program, Cherepovets

	Target value / action	Status	Term of implementation	Effect
4.5	Transfer by river water between c. 911 and 901 for boiler blowdown tank cooling.	Expert evaluation of energy resources consumption is provided, clarification is required.	Q4 2021	Reduction of annual consumption of PKhV.
4.6	Pumps and coolers transfer to circulating water of TC1 circuit.	Expert evaluation of energy resources consumption is provided, clarification is required.	Q4 2021	Reduction of river (raw) water consumption and PC.
4.7	Transfer of Cherepovets Complex subdivisions for LED lighting.	Initial data are provided, clarification of further implementation results monitoring procedure is required.	2021–2022	Reduction of electric energy annual consumption, reduction of MRO costs.
4.8	Construction of SK 3300 production on PC of Apatit JSC.	Completed.	2020	<ol style="list-style-type: none"> 1. It is planned to generate steam on system SK 3300 for recycling on TPP, which will allow to reduce the natural gas consumption while electric energy remains unchanged. 2. Reduction of cross flows along the communication lines of TPP-GPP. Minimization of time and degree of limitation of electric energy generation at TPP during repair work performance on communication lines.

Plan of Energy Efficiency Program actions approval

Key directions of Energy Efficiency Program, requiring approval in accordance with Company procedures.

Own electric energy generation increase

4 projects, including:

- Recycling of unused 13 atm steam of nitric acid production units;
- Construction of steam turbine at the Phosphor Complex.;
- Installation of solar power plant in Volkhov;
- Development of own electrical generation in Balakovo.

Reduction of energy resources consumption

12 projects, including:

- Transfer to LED lighting (APT-Ch, KFA, BFA, VFA);
- Installation of frequency converters (APT-Ch, BFA).

Reduction in heat losses

2 events:

- Reconstruction of drying drum sections with thermal insulation arrangement (KFA);
- Reconstruction of steam pipeline with replacement of thermal insulation (VFA).

Expected terms of elaboration and approval of separate activities of the Program.

