REVISED INVESTMENT PROGRAM ALUM 2022

The revised Investment Program of ALUM SA for the year 2022 involves minimal but strictly necessary costs for:

- Ensuring the operational continuity by extending the lifetime of the red mud pond in compliance with the provisions of the environmental agreements to which ALUM is obligated to comply with;
- The continuation of the consolidation works at the precipitation vessels and the accomplishment of the documentation with the obtaining of the Approvals and Agreements necessary to start at the beginning of the following year the consolidation works of the White Filtration building;
- Compliance with the recommendations received from the Ministry of Environment, the Romanian Bureau of Legal Metrology (BRML) and ANRE;
- Increasing the operational safety of the static and dynamic equipment necessary for the activity of the ALUM departments;
- Increasing the safety in operation and observing the ISCIR norms in force.

Executive Summary:

ALUM's investment program for the year 2022 requires a total estimated budget of **5,817,000 USD** and contain 12 investment projects,

US$'000

Company	***No. of investment projects***	***Necessary Capex***
		2022
ALUM SA Tulcea	***12***	***5,817***

The 12 investment objectives of the Investment Program of ALUM SA for 2022 are structured in three chapters as follows:

- Chapter 1 - Environmental projects to ensure operational continuity – includes 3 investment objectives (an objective is under finalization) with a necessary forecasted budget of **4,403 ths. US$**;

- Chapter 2 - Projects to support ANRE proposals – includes 2 investment objectives (an objective is finalized) with a necessary forecasted budget of **389 ths. US$**;

- Chapter 3 - Projects for ensuring the operating conditions and production process safe continuity – includes 7 investment objectives (one completed, 3 on standby and 3 objectives in which acquisitions will be made only with the punctual approval of the upper management of Alum) with a necessary forecasted budget of **1,025 ths. US$**.

The capacity of performing investments is decisive for the future of ALUM SA and the evaluation of investments is a very important task for ALUM S.A.

The main key aspect of investments request is financial evaluation and budgeting the investments objectives spending.

Financial effort of these investments will be assured both by internal financial resources and by loans, like leasing financing or credits.

Chapter 1 – Environmental projects to ensure operational continuity

Includes a number of 3 investment projects absolutely necessary mainly for:

- extending the lifespan of the red mud pond by continuing the staged and safe elevation of the red mud dams by 5 m in the next 6 years according to a new solution proposed by the Technical University of Constructions Bucharest. This estimates an increase in the life of the pond by approx. 14 years;
- ensuring the operational continuity of the pond and of the plant for a period of time of at least 14 years by purchasing 27 + 11 hectares of lands;
- maintaining in safe conditions of the perimeter dams of the Red Mud Pond and eliminating the risks of breaking the dams or producing exfiltrations;
- ensuring the continued safe storage of the pond and according to the provisions of the Integrated Environmental Authorization held by ALUM Tulcea;
- eliminating the losses of sodium hydroxide solution when unloading it from the CF wagons by executing a new lye unloading station.

Objective Code	Objective name
D-072.22.SRR.01	**Increasing the storage capacity of the red mud pond by elevating the dikes throughout the perimeter** This investment objective is scheduled to be completed in December 2022 and is necessary to continue the safe operation of the red mud pond and increase its lifespan and has a total estimated budget for 2021 of **1,203 thousand USD**.
D-083.21.SRR.01	**Extending the surface of the red mud pond and securing the red mud storage in the SE area** This investment objective is scheduled to be completed in December 2022 and is necessary to ensure the operational continuity of the installation and maintain compliance with the new provisions of the legislation on the environmental line on the safe storage of red mud.

	Has the total estimated budget for 2022 of **3,070 thousand USD**.
D-079.21.CET.01	**Construction of industrial installation for the efficiency of the soda unloading process from railway wagons and autotanks** This investment objective is necessary to reduce accidental leakage of soda, elimination of losses for sodium hydroxide solution and has a total estimated budget for 2022 of **130 thousand USD**. The investment objective is expected to be completed in July 2022.

Status of execution of works on the environmental line:
- The elevation works of the Red Mud Pond dams are contracted and are being carried out according to a Master Plan for the development of the pond prepared by UTCB and approved by the Dam Commission. So far, 32% of the works scheduled for 2022 have been completed.
- For the extension of the Red Mud Pond, the Urbanism Certificate was obtained, the lands were removed from the agricultural circuit, the Technical Project and the Impact Study are also contracted and the land acquisition contract is being signed.
- The execution of the new lye unloading station is completed, the commissioning tests have been performed and the works for the roof of the installation are being executed.

Chapter 2 – Projects to support ANRE proposals

It includes a number of 2 investment projects (one finalized) absolutely necessary mainly for compliance with the recommendations received from the Ministry of Environment, the Romanian Bureau of Legal Metrology (BRML) and ANRE.
The investment projects consist in the acquisition and installation of Power House steam measuring systems and measurement and regulation of steam flow and temperature for digestion batteries.
Currently, the investment objective for the acquisition and installation of steam flow measurement systems has been completed and the acquisition of the necessary parts for regulating the steam flow and temperature for the digestion batteries has been contracted.

Objective Code	Objective name
D-088.22.FRL.01	**Steam flow and temperature adjustment for Digestion batteries** This investment objective is scheduled to be completed in December 2022 and is required to comply with ANRE's proposals and has a total estimated budget for 2022 of **177 ths. USD**.
D-089.22.CET.01	**Acquisition and installation of steam flow measurement systems** This investment objective has been finalized and was necessary to be implemented in order to be able to achieve, according to the latest requirements, the energy balance underlying the issuance of greenhouse gas emission certificates. The total budget for 2022 is **212 ths. USD**.

The implementation of these investment objectives is necessary for:

- compliance with the program of measures carried out following the energy audit for the period 2019-2022, the fulfillment of which is monitored by ANRE and the reduction of specific energy consumption;
- reduction of specific energy consumption;
- compliance with the recommendations received from the Ministry of Environment and with the recommendations received from the Romanian Bureau of Legal Metrology (BRML);
- substantiation of data related to the allocation of CO2 certificates;
- centralization of natural gas and steam consumption within the Power House section.

Chapter 3 – Projects to ensure the operating conditions and the safe continuity of the production process

It includes a number of 7 absolutely necessary investment projects (one completed, 3 on standby and 3 objectives in which acquisitions will be made only with the punctual approval of the upper management of Alum) mainly for:

- replacement of spare parts belonging to used equipment that no longer have the functional characteristics for which they were initially purchased;
- increasing the safety in operation of static and dynamic equipment necessary for the activity of ALUM departments;
- increasing the safety in operation and observing the ISCIR norms in force;
- prevention of possible incidents and accidental stops due to the deterioration in time of the erasures from the foundations of the Precipitation vessels;

Objective Code	Objective name
D-081.21.FRL.01	**Modernization of a Digestion line by replacing the registers at the preheating and rehabilitation of autoclaves agitation system (Amber)** The project was completed and implemented in order to increase the efficiency of heat transfer of digestion autoclaves and reduce the specific consumption of natural gas. The total budget for this investment project in 2022 is **76 ths. USD**.
D-086.21.CET.01	**12 MWe high efficiency cogeneration power plant** The project aims: ➢ achieving savings in fuel / primary energy consumption through high efficiency cogeneration processes; ➢ superior recovery of the thermal potential of waste gases from industrial processes; ➢ reduction of carbon emissions related to fossil fuels (cogeneration effect). The total budget for this investment project in 2022 is **0 ths. USD**. In 2022, the updating of the Feasibility Study and the preparation of the financing documentation in accordance with the Guide issued for PNRR will be continued and finalized. The budget for this objective will be forecast at the launch of the Modernization Fund Guide.

D-060.21.SFR.01	**Fostering investments within ALUM SA by acquiring high technology fixed assets** The project aims: • bauxite residue deposited in the bauxite residue disposal site with a moisture decreasing from the current average value of 48% mass percent to 25% with the following positive effects: • increasing the exploitation life of the bauxite residue disposal site; • increase stability for the bauxite residue disposal site; • increasing the capacity of liquid phase from the bauxite residue on the bauxite washing line to recover caustic soda and alumina; • compliance with the BAT provisions relating to deposited bauxite residue moisture decreasing. The total budget for this investment project in 2022 is **41 ths. USD** needed to finalize the project's documentation.
D-092.22.ALM.01	**Implementation of an intelligent energy consumption monitoring system within S.C. ALUM S.A.** The project aims: • optimizing the consumption of compressed air and steam at the level of the ALUM platform; • real-time tracking of compressed air and steam consumers on the platform and easy and accurate identification of energy-deficient and inefficient areas. The total budget foreseen for this investment objective in 2022 is **0 ths. USD and the financing contract will be signed** in February 2023 depending on the evolution of the economic situation.
D-070.22.ALM.01	**Maintenance Capex** The objective is expected to be completed in December 2022 and consists of: ➢ ensuring the constructive conditions for increasing the filtration capacity, the competitiveness and the quality of the alumina produced; ➢ increasing the safety of Alum personnel in accordance with the environmental and safety requirements in effect; ➢ testing the degree of reduction of thermal losses in the upper area of the vessel and the reduction of the phenomenon of expansion of the solution in the area of the collecting boxes and premature initiation of hydrolysis; ➢ prevention of possible incidents and accidental shutdowns due to the damage in time of the erasures from the foundations of the Precipitation vessels. The total budget forecast for this objective in 2022 is **416 ths. USD**.
D-071.22.ALM.01	**PPE 2022** The total budget for this investment objective in 2022 is **188 ths. USD**. The investment objective consists in the replacement of some parts, which no longer have the initial functional characteristics, which were or are to be acquired.
D-066.22.ALM.01	**Endowments 2022** The total budget for this investment target in 2022 is **304 ths. USD.** The investment objective consists in the endowment with strictly necessary equipment that have been or are to be purchased. ➢ Gas flow measurement system; ➢ Electric oven; ➢ Pneumatic pickhammers; ➢ Hammelmann pump model HDP 803; ➢ Reverse osmosis station; ➢ Etc.

The net budget requested for approval is 5,817,000 US$.

The key decisions necessary to be taken for investment plane implementation are as follows:

- approval of the revised Investment Program for 2022;
- the development of the Investment Program according to a detailed schedule;
- establishing and approving detailed action plans for each investment project.

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