INVESTMENT PROGRAM ALUM 2022

Investment Program of SC 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;
- Achieving savings in fuel consumption / primary energy prince of high efficiency cogeneration processes;
- 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;
- Increase the degree of automation and control of the plant;
- Monitoring and centralization of all consumers of compressed air and steam on the ALUM platform;
- Compliance with the new BAT provisions regarding the reduction of the red mud moisture stored in the pond;

Executive Summary:

ALUM's investment program for the year 2022 requires a total estimated budget of **6,062,000 USD** and contain 12 investment projects,

US$'000

Company	***No. of investment projects***	***Necessary Capex***
		2022
ALUM SA Tulcea	***12***	***6,062***

from which:

- 7 investment projects started before 2022 (3,554,000 USD);
- 5 new investment projects (2,508,000 USD).

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

- Chapter 1 - Environmental projects to ensure operational continuity – includes 3 investment objectives with a necessary forecasted budget of **4,466,000 US$**;

- Chapter 2 - Projects to support ANRE proposals – includes 2 investment objectives with a necessary forecasted budget of **565,000 US$**;

- Chapter 3 - Projects for ensuring the operating conditions and production process safe continuity – includes 7 investment objectives with a necessary forecasted budget of **1,031,000 US$**.

The capacity of performing investments is decisive for the future of SC 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:

- Elimination of sodium hydroxide solution losses when unloading them from railway auto-tanks;
- Extending the lifespan of the redmud 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;

Objective Code	Objective name
D-072.18.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 2022 of **1,250 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 **3,086 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 leach, elimination of losses for sodium hydroxide solution and has a total estimated budget for 2022 of **130 thousand USD**.

Chapter 2 – Projects to support ANRE proposals

It includes a number of 2 investment projects absolutely necessary mainly for compliance with the recommendations received from the Ministry of Environment, the Romanian Bureau of Legal Metrology (BRML) and ANRE.

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 **350 thousand USD**.
D-089.22.CET.01	**Acquisition and installation of steam flow measurement systems** This investment objective is scheduled to be completed in July 2022 and is necessary 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 **215 thousand USD**.

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 mainly for:

- replacement of spare parts belonging to used equipment that no longer have the functional characteristics for which they were initially purchased and which are strictly necessary for the realization of the production plan;
- 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;
- increasing the efficiency of heat transfer of leaching autoclaves;
- eduction of carbon emissions related to fossil fuels (cogeneration effect);

- Monitoring and centralization of all consumers of compressed air and steam on the ALUM platform;
- Compliance with the new BAT provisions regarding the reduction of the red mud moisture stored in the pond;
- decrease of the electricity purchased by Alum from SEN.

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 consists in increasing the efficiency of the thermal transfer of the Digestion autoclaves and the observance of the legislation, norms and standards in force, in the field of environmental protection. The total budget for this investment project in 2022 is **80 thousand 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 thousand USD**. Starting in 2022 consists in finalizarea the feasibility study and the necessary documentation for co-financing.
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 **43 thousand USD**.
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 for this investment project in 2022 is **0 thousand USD**.
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 **448 thousand USD**.
D-071.22.ALM.01	**PPE 2022** The total budget for this investment objective in 2022 is **170 thousand USD**. ➢ Reducers 316_17; ➢ Atlas compressor element; ➢ 55KW frequency converters; ➢ Electric motor 315 KW / 1500 rpm and convertor; ➢ Ceramic control valve; ➢ Bulldozer repair kit; ➢ Etc.
D-066.22.ALM.01	**Endowments 2022** The total budget for this investment target in 2022 is **290 thousand USD.** ➢ Gas flow measurement system; ➢ Electric oven; ➢ Pneumatic pickhammers; ➢ Hammelmann pump model HDP 803; ➢ Reverse osmosis station; ➢ Etc.

The net budget requested for approval is 6,062,000 US$.

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

- investment program approval
- development of investment program accordingly with detailed diagram
- establishment and approval of detailed action planes for each one investment project.

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17.03.2022