INVESTMENT PROGRAM ALUM 2017

Investment Program of SC ALUM SA for the year 2017, although imply high costs is a program absolutely necessary to:

- increase energy efficiency by optimization of combustion and heat transfer processes;
- increase competitiveness by installing new equipment that will allow to obtain new types of products;
- increasing operation safety for plant installation supplied with steam and natural gas;
- ensuring plant operational continuity by complying with environmental stipulations to which ALUM is mandatory to align.

Executive Summary:

ALUM's investment program for the year 2017 requires a total estimated budget of **9,156,000 USD** and contain 17 investment projects,

US$'000

Companie	***Nr de proiecte de investitii***	***Capex necesar***
		2017
ALUM SA Tulcea	***17***	***9,156***

din care:

- 8 investment projects approved and started in 2016 (4,680,000 USD) of which:
  - 3 investment projects will be completed during 2017 (1,710,000 USD);
  - 5 investment projects will be completed during 2018 (2,970,000 USD);

- 9 new investment projects (4,476,000 USD) of which:
  - 4 investment projects will be completed during 2017 (3,406,000 USD);
  - 4 investment projects will be completed during 2018 (970,000 USD in which one project cofinanced with UE funds);.
  - 1 investment project will be completed during 2019 (100,000 USD);

The 17 investment projects of 2017 ALUM's investment program are structured into four chapters as follows::

- **Capitol 1 – Projects to assure plant operational continuity**– includes a number of 4 investment objectives with a total forecast budget of **1,350,000 US$;**

- **Capitol 2 – Proiecte pentru exploatarea eficientă si in condiții de siguranța a instalațiilor industriale** – includes a number of 6 investment objectives with a total forecast budget of **3,267,000 US$;**

- **Capitol 3 – Proiecte notificate la ANRE** - includes a number of 5 investment objectives with a total forecast budget of **1,850,000 US$;**

- **Capitol 4 – Produse noi ALUM** – includes a number of 2 investment objectives of which one cofinanced with UE funds and have a total forecast budget for 2017 of **2,570,000 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 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 – Projects to ensure operational continuity

Includes investment projects necessary to:

- compliance with requirements of ALUM's Integrated Environmental Authorization regarding safe operation of red mud pond and dust emissions monitoring at bag filters;
- increasing red mud pond life time;
- assure safe red mud pumping from the plant to the red mud pond;

Objective code	Objective denomination
D-063.17.SRR.01	**Reinforcing the perimetral dykes for the red mud pond - left bank embankment and improve the sprinkle system for preventing the dust formation** This investment objective is necessary to ensure the continuation of safe red mud storage area operation has a total forecast budget of 500 mii US$;
D-060.17.SRF.01	**Purchasing press filters for disposal bauxite residue moisture decreasing** This investment objective is necessary to increase life time period of red mud pond and extend the possibilities of red mud revaluation. The investment objective is scheduled to be implemented during the period of 2017-2019. The total forecast budget for 2017 is 100 mii US$;
D-064.17.SRR.01	**Red mud pipe, length 4,5 km (refinery to red mud pond)** This investment objective is scheduled to be implemented during the period of 2017-2018 and is necessary to assure safe pumping of the red mud from the plant to the red mud pond. The total forecast budget for 2017 is 600 mii US$
D-068.16.SAC.01	**Particle emissions monitoring system for bag filters** This investment objective is scheduled to be implemented in 2017 with a total forecast budget of 150 mii US$

Chapter 2 – Projects for efficient and safe operation of industrial facilities

Objective code	Objective denomination
D-067.16.CET.01	**Burned gases fan for Steam Boiler no 2** This investment objective was approved and will be implemented during the period 2017-2018. The total forecast budget for 2017 is 100 mii US$
D-056.16.SAD.01	**Consolidation foundations Precipitation tanks** This investment objective is scheduled to be implemented in the period 2017-2018 with a total forecast budget of 490 mii US$. o The work will be done in two stages and consists in 10 decomposition tanks removal from technological circuit and reinforcing their foundations; The forecast budget for 2017 is 220 mii US$.
D-069.16.ALM.01	**Warning system for fire protection** The investment objective was approved and the total forecast budget for this investment objective is by 200 mii US$. o Contracting, acquisition and operation of a system with features as requested by ISU;
D-071.17.ALM.01	**Investments for maintenance and improvement of equipment parameters - Alum (PPE)** The total forecast budget for this investment objective in 2017 is 1,978 mii US$.
D-069.17.ALM.01	**Plant economic lightning** Investment objective has a total forecast budget of 150 mii US$ and will be implemented gradually in the period 2017-2018. The total forecast budget for this investment objective in 2017 is 50 mii US$.
D-066.17.ALM.01	**Endowments 2017** The total budget forecast for this investment objective is 728 mii US$. o Heat exchangers to heat strong liquor and dense slurry; o Sieving system for dry hydrate; o Elevator for calcined alumina; o Equipment obsolete or which have no longer the functional characteristics for which they were purchased;

Chapter 3 – Projects to support ANRE proposals

Objective code	Objective denomination
D-051.16.CET.01	**New natural gas burners at Steam Boiler no 1** This investment objective was approved and is scheduled to be implemented in 2017 with a total forecast budget 1,360 mii US$. o Acquisition and installation of low NOx combustion system of the boiler C2Ap1;
D-058.16.SRL.01	**Optimization of steam lines and installing steam traps in Digestion** This investment objective was approved and is scheduled to be implemented during the period 2017-2017, total forecast budget for this investment objective is 300 mii US$ and for the year 2017 forecast budget is 150 mii US$.
D-070.16.ALM.01	**Maintenance Capex (Digestion modernization - autoclaves registers and agitators for 2 lines digestion and evaporator)** The investment objective was approved and is scheduled to be finished 2018, the total forecast budget for this investment objective is 700 mii US$ from which 150 mii US$ for the year 2017.
D-070.17.ALM.01	**Acquisition and installation frequency converter devices** The investment objective has a total forecast budget by 200 mii US$ and will be implemented gradually in 2017.

Chapter 4 – New ALUM products

Objective code	Objective denomination
D-059.16.ALM.01	**Alum Increasing competitiveness by installing equipment to obtain wet and dry hydrate** The objective: - was approved and started in 2016; - will be finalized in august 2018; - has a total forecast budget for 2017 by 2,020 mii US$.
D-059.17.ALM.01	**Site arrangement and installation of hydrate drying, grinding and classification equipment** The investment objective is approved, will be finished at the begining of 2018 and has a total forecast budget for 2017 by 550 mii US$.

Total budget requested for approval is 9,156,000 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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