**ALUM SA TULCEA**

**Managing Director**
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# 2022 Alum Activity Plan

The economic crises generated by the pandemic was amplified in 2021 by the power crisis due to the accelerated increase of electric power and natural gas prices with negative impact on production costs of calcined alumina and electrolytic aluminium.

Deterioration of international situation due to the conflict in Ukraine has accentuated the energy crises and the price of electric power and natural gas raised dramatically leading to unsustainable costs for alumina.

Alro Group, Alum's parent company, has always been open to cooperation and requested the authorities' support to the highest level in the effort to contract the electric power and natural gas at reasonable prices up to the limit of breakeven point. Nevertheless, accepting the current prices of electric power and natural gas would lead to huge financial losses for the Company and impossibility to continue the production cycle.

Aluminium is one of the industrial metals with the highest energy consumption and the accelerated increase of electric power prices lead to decrease of the production level of alumina and primary aluminium in Europe. Therefore, downsizing measures were taken at Birac in Bosnia and Alteo Franta stopped its hydrate and calcined alumina production. Also, aluminium production facilities were shutdown in San Ciprian Spain, KAP Montenegro, while at Alro Slatina and Aluminium Dunkerque France measures to reduce production capacities were taken.

Starting April 2022 the ALUM production costs have been severely impacted due to gas price, starting May acquisition for Alro reaching a level of 913 USD/Mt DDP Slatina.

Market data published in the specialty reports show a current market reference price of approx. **515** USD/Mt DDP Slatina.

Alro/Alum has the option to buy 25,000 – 30,000 Mt +/-5% calcined alumina at a price of **477** USD/Mt CIF Cta ~ **505** USD/Mt DDP Slatina.

The natural gas and electric power prices have the greatest impact on the Alum production costs with approx. 500 $/Mt alumina at the level of total cost for the alumina manufactured in 2022.

Considering the challenges brought by modification of logistic chain in supply of raw material for its main customer – ALRO SA, ALUM SA will organize contracting of calcined alumina

from external suppliers, necessary logistics to Constanta port, customs formalities, as well as handling services in Constanta port, thus offering its client the required amount of calcined alumina necessary for production process.

Considering the above-mentioned conditions, the 2022 Activity Plan was reviewed as follows:

## A. Personnel of Production Direction and Mechanical – Energy Direction

Considering production activity suspension in August 2022, the number of personnel directly involved in installations cleaning, maintenance/repair activities, as well as in research activity continuity within the Research Development Department, was reviewed.

Under the new operational conditions of Alum, the company organisational chart was reviewed taking into account keeping a core of specialists in all plants departments to prepare for production activity resuming when the evolution of electric power and natural gas prices will allow.

During the production activity suspension period, measure will be taken to keep all operational licences (AIM, GES, ISCIR etc.) as well as accreditations according to the certified management standards SR EN ISO 9001:2015, SR EN ISO 14001:2015, SR EN ISO 45001:2018 and SR EN ISO 50001:2019.

## B. Production activity

In 2022 was budgeted a production level of 111,219 Mt alumina and 122,350 Mt calcined alumina. Delivery of calcined alumina to ALRO Slatina amounting to 19,744 Mt. Delivery of calcined alumina to the export/others amounting to 7,450 Mt. Aluminium hydroxide sales of 10,814 Mt.

***Alumina production***

| **Month** | **Calcined alumina production Mt/month** | **Alumina production Mt/month** |
|---|---|---|
| January | 27,930 | 23,361 |
| February | 17,560 | 17,848 |
| March | 16,750 | 17,335 |
| April | 14,850 | 15,038 |
| May | 12,550 | 12,327 |
| June | 12,900 | 12,600 |
| July | 13,330 | 12,710 |
| August | 6,480 | - |
| September | - | - |
| October | - | - |
| November | - | - |
| December | - | - |
| **Total** | **122,350** | **111,219** |

Considering the technical-economic analysis based on the energy crisis, international geopolitical situation and alumina market conditions, the only solution to save the electrolytic aluminium production in Alro and create premises for production activity resumption at Alum is temporary suspension of Alum production until the electric power and natural gas price reaches the breakeven point for alumina production at Alum.

In order to suspend the alumina production activity starting August 1st, action plans are drafted for installations emptying, equipment cleaning and performance of maintenance and repairs of the shutdown equipment.

Temporary production suspension will be achieved with concentration of solutions obtained from Precipitation plant emptying.

During the Alum standby, the Production Department will assure the process solutions management. Volumes obtained from the tanks emptying, will be stored in Predesilication, Red Filtration, Precipitation, Evaporation tanks.

Permanent monitoring of Red mud pond with installation/maintenance of wetting/ spraying system on a surface of approx. 45 hectares to prevent the occurrence of dusting.

During the temporary production suspension, other programs for Alum operation optimisation have been drafted:

- Program for revision and repair of all equipment, especially the main installations. Achievement of this program will lead to the increase of the operational safety level, improvement of installations microclimate and reduction of noxious emissions.

- Program for technological cleaning of washing units, thickeners, precipitation tanks, technological routes, heat exchangers, water-cooling towers, digestion autoclaves and evaporation units.

- Administrative Program for upgrading, painting of buildings, equipment, piping painting in conventional colours, rehabilitation of vestiaries, green areas and access roads. The achievement of this program will contribute to the improvement of working conditions and Alum image.

**C. Research- Development activity**

During the production suspension, the following activities will be continued:

- the research activity on the equipment within the Alum Research Department to increase Alum competitiveness by obtaining and marketing new high value- added products:
  - Independent equipment /installation for research and development the technology of dry aluminium hydroxide production;
  - Independent equipment /installation for research and development the technology of dry aluminium hydroxide grinding and sorting;

- Independent equipment /installation for research and development the technology of wet aluminium hydroxide classification.

  The above-mentioned equipment was purchased and put into operation within the project "*Endowment of SC ALUM SA Research-Development Department with independent, performant research installations in order to increase the economic competitiveness and business development" as per the acquisition procedure, applicable to the programs financed within the 2014 – 2020 Competitiveness Operational Program, Priority axis 1 „Research, Technological Development and Innovation (Cdi) for the increase of Economic Competitiveness and Business Development".*

- Study the possibility to use the red mud as raw material for other industrial activities (construction, agriculture etc.) with participation of Alum Research Department at projects financed with EU funds: Removal, Reactiv and Reescue carried out according to HORIZON 2020 and drafting and submitting the progress reports;
- Testing the possibility to use the red mud with the diversification of new high value-added products;

## D. Maintenance –Repairs Department

### D1. Maintenance repairs activities

The main activity of the Maintenance–Repairs Department is to maintain in operation the process flow equipment and perform repairs according to the Revisions and Repairs Plan. In 2022 its activity will focus on repairs and mothballing of shutdown equipment due to production activity suspension.

In 2022, an amount of approx. **1,696,000 USD** was budgeted for this activity, out of which **678,000 USD** represent third-parties repairs, **918,000 USD** in-house repairs and **100,000 USD** maintenance services.

**Major repairs carried out with third parties:**

- Boiler no. 1 economizer repair - 180,000 USD
- Repair of 105 tonnes boiler - 43,000 USD
- Thermal insulations - 190,000 USD

Other third-parties repairs

- revision of transport means - 39,000 USD
- revision of high pressure pumps - 18,000 USD

**Major repairs carried out in-house:**

Repair of conveying belts - 20,000 USD
Repair of grinding mills - 80,000 USD
Repair of digestion units - 80,000 USD
Repair of DN 20 M units - 50,000 USD
Repair precipitation tanks - 60,000 USD
Repair of bag filters - 30,000 USD
Repair of boilers - 40,000 USD
Repair of pumps - 60,000 USD

## D2. In-house Investment Activities

The Maintenance-Repairs Department carries out specific activities achieved with own forces to put in operation the approved investments.

**In-house Investments**

- Build the roof of the soda discharge station
- Extension of red mud evacuation system at the red mud pond;
- Controlled and automatic system for condensate evacuation from the digestion units.

Technical staff of the Maintenance-Repairs Department takes part in monitoring and completion of the investment works achieved with third parties and ensures the necessary conditions for these investments commissioning.

## D3. Continuous improvement activities

The most important works for the improvement of Alum process flow and operation scheduled for 2022 are as follows:

- Transforming 20 m diameter tanks in washing units–only 20 m diameter units are used for mud washing in Red Filtration
- Upgrading the slurry feeding system of the Digestion units feeding pumps, upgrading the feeding system of the Digestion units
- Upgrading the White Filtration building
- Upgrading the Duplex building
- Upgrading the concrete platforms at Grinding, Digestion, Red Filtration
- Extension of red mud dump spraying system
- Replacing pumps or routes to reduce the power consumption (process flow optimization)
- Removal the unused pipes, dismantling the disposed unused units and selling the scrap.

## E. Activity of the Quality-Technical-Investment Department

Proposal to continue the implementation of investment projects strictly necessary to:

- Increase the safety level and storage capacity of red mud;
- Compliance with the environmental and ANRE requirements;
- Continue the consolidation works at the Precipitation tanks and draft the documentation to obtain the licences and approval necessary to start the consolidation works at the begging of next year.

Therefore, at the end of 2022 a total amount of **5,817,000 USD** is budgeted as follows:

- **Chapter 1 – Environmental projects to ensure operational continuity –** comprises 3 investment objectives with a forecast budget of **USD 4,403,000**;

- **Chapter 2 – Projects supporting the ANRE proposals -** comprises 2 investment objectives (one is completed) with a forecast budget of **USD 389,000;**
- **Chapter 3 – Projects for ensuring the operating conditions and production process safe continuity –** comprises 7 investment objectives (one completed and 3 in standby) with a forecast budget of **USD 1,025,000**;

For energy efficiency projects, the approval of the following is proposed:

- Completion of entire documentation for the project *„Increase the energy efficiency of electric power supply at Alum S.A. by installing a solar park within Alum S.A. premises (ensuring the CO2 emissions reduction in compliance with the EU objectives on energy production from the renewable sources)"* and postpone to submit it in order to be analysed and obtained co-financing in a session subsequent the one with the closing date on June 15, 2022;
- Postpone signing the co-financing contract for the project „*Implementing an intelligent monitoring system of power consumption within S.C. ALUM S.A.";*
- Continue and complete the update of the Feasibility Study and drafting in compliance with the Guidance issued for the PNRR of the financing documentation of the project *„12 MWe High efficiency cogeneration plant"*.

## F. Proposed budget

Alum reviewed budget for the year 2022 forecasts the achievement of a total income amounting to USD 116,230,355 as a result of calcined alumina and hydrate sale. As well, the budget includes other incomes amounting to USD 357,142 from miscellaneous activities, USD 1,869,467 representing compensation of 2021 indirect emissions and USD 10,025,049 sale of 119,000 CO2 certificates.
For the budgeted production of 111,219 Mt, total necessary expenses are amounting to USD 123,667,419.
Thus, 2022 Alum reviewed budget estimates a profit of USD 4,034,260.

Production unit costs for the period January- August are amounting to 421.11 USD/|Mt for hydrate and 780.90 USD/Mt for calcined alumina.

Alum costs for August – December 2022 are amounting to USD 9,550,651.

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