

Reducing energy consumption in aluminium reduction cells

Client: Voerde Aluminium

Location: Veorde, Germany



The Project

The aim of the project was to reduce potline energy consumption without compromising current efficiency.

To achieve this LMRC together with the smelter developed a project plan which identified, immediate projects (no capital cost required), short- mid term projects (some investment required) and long term projects (significant capital cost required). Two projects that were implemented were:

1. Develop and implement an airburn control system which quantifies and systematically reduces anode air burn. This was coupled by an anode cover consistency system that delivered a revised procedure of anode dressing.
2. An advanced pot diagnostics and response routine was implemented, which identified pots that deviating from the defined control limits at the early stages, and initiating a response plan to bring them back in control.

LMRC's Role:

1. Work with the smelter to identify the improvement pathways and develop project plan
2. LMRC engineers designed a new sequence and procedure to dress the anodes and maintain the cover integrity and reduce air burn.
3. LMRC engineers optimised the settings and control limits of various parameters in the pot's control system. LMRC also developed and implemented a routine statistical analysis system that identified pots deviating or about to deviate from prescribed limits. With the smelter process control team a response plan was assigned for different scenarios to bring the pots back in control promptly.

The Results

The reduced airburn lead to reduced noise and improve CE from 94.4 to 96.5%

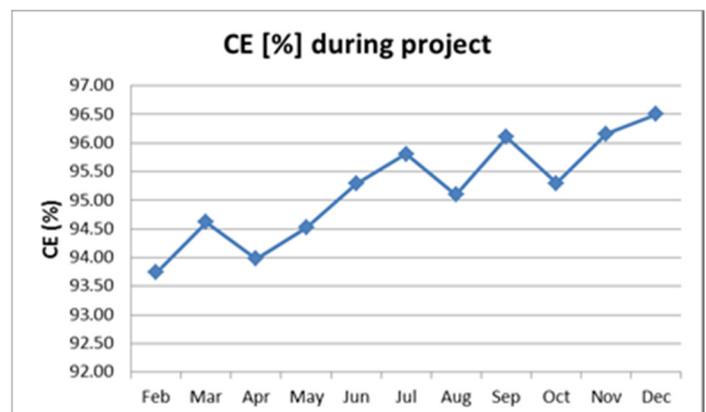


Figure 1: Current efficiency during the project.

Stabilising the pots allowed reduction in ACD which lead to reduction in energy consumption by 0.5 kWh/kg Al,

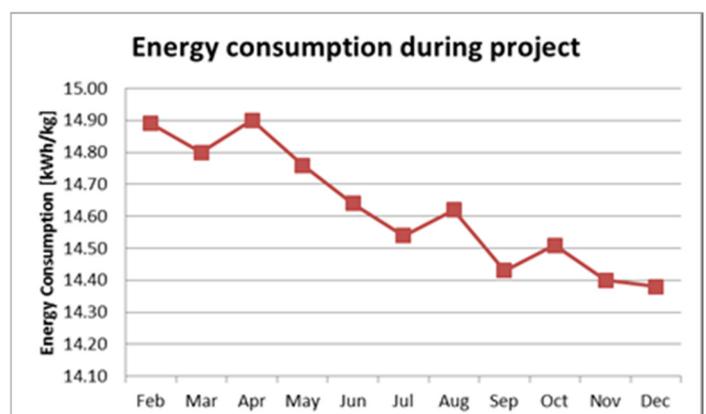


Figure 2: Energy consumption trend during the project

These steps increased the profitability of the smelter from -200,000 Euro to 1.5 M Euro within a year