

Boyne Smelters Development Project

Carbon bake furnace 4

“Building our Future”

2008-2012



Boyne Smelters Limited (BSL) has been in operation since 1982 and over time has extensively expanded. Production from the initial two reduction lines was increased in 1997 by the addition of a third reduction line, which raised annual production capacity to more than 556,000 tonnes from 230,000 tonnes of aluminium.

In 2008, the \$720 million Boyne Smelters Development project commenced on site to significantly modernise the smelter to ensure its longevity. The project consisted of constructing a completely new CBF4 with upgraded technology, along with a projected decommissioning of the two original carbon bake furnaces one and two. Additional improvements in the project included the replacement of overhead cranes, a crane runway upgrade and improved alumina transport system to the reduction cells.

2009



2010



2011



2012



“The \$720 million Boyne Smelters Development project, including the \$330 million CBF4, will extend the life of BSL, significantly improve environmental performance and increase the efficiency of the smelting process.”

What is a Carbon Bake Furnace (CBF)?

A carbon bake furnace (CBF) is essentially a super-sized oven which bakes carbon blocks, called 'anodes' that are required in the aluminium production process. The gas-fired furnace will typically produce 2,500 carbon anodes per week, while burning less natural gas than the original carbon bake furnaces one and two.



The 1.4 tonne 'green' (pre-baked) anodes are loaded into the furnace via crane and heated at temperatures over 1,200 degrees Celcius. The heating and baking process takes approximately 18 days, at which time they are removed from the bake and transported to the reduction cells for use as electricity conductors to make aluminium.



The overhead crane lifts 5 carbon anodes into the bake furnace.



Over 3.5 million refractory bricks were used to line the furnace pits.



Overlooking the completion of CBF4.

CBF4 Benefits

- Exceptional environmental improvements as the technology adopts a smarter and 'cleaner' burn cycle, reducing carbon dioxide emissions as well as the occasional odours that can result from the baking process.
- Its uses much less gas than CBF1&2, which will reduce BSL's greenhouse gas emissions by 20,000 tonnes annually, or removing 6,000 medium cars from the road each year.
- Increased production efficiency – improved quality of carbon anodes produced, while also minimising waste or 'reject' anodes. Less than 1% of carbon anodes baked in CBF4 do not meet quality specifications, whereas the old bakes had up to 4-5% of anodes rejected.
- Improvements will ultimately support us in achieving our vision of burning all volatiles within the bake, with minimal visible and odorous emissions to the atmosphere.
- Construction included the use of over 3.5 million refractory bricks, 34,000 tonnes of concrete, over 14,000 pieces of steel in the building alone and took 1.3 million man hours to complete.
- CBF4 has four firing groups, each with 54 gas burners. The first firing group was lit on 7 February, while the last was lit on 31 March.
- The first 'green' (pre-baked) anode was lifted into CBF4 on 14 February where it baked for 20 days before being ready for use and lifted out of the bake on 5 March.
- The cleaner burn cycle of CBF4 also creates excellent occupational health benefits for furnace operators. The area is a cleaner work environment as there are no more gas fumes during fire changes.