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## *Vale aluminium acquisition*



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### QUICK OVERVIEW

With the acquisition of Vale's aluminium assets, Hydro is a fully integrated, resource-rich aluminium company with attractive positions in alumina and power, two of the most important input factors in the production of primary metal. We have transformed our position in bauxite and alumina, making us self-sufficient with regard to all of our raw material needs and positioning Hydro as a leading global supplier to other industry players. We are one of the world's largest producers and suppliers of alumina and primary aluminium, with strong global positions in mid and down-stream operations.

## KEY DEVELOPMENTS AND STRATEGIC DIRECTION

### Key developments

Completing the acquisition of Vale's aluminium assets transforms Hydro into one of the largest producers and suppliers of alumina. The acquisition increases our ownership in Alunorte, the world's largest alumina refinery and one of the most cost effective, from 34 percent to 91 percent. It gives us control over one of the largest bauxite mines, through a 60 percent ownership in the Paragominas mine with a commitment to increase our interest to 100 percent by 2015. The acquisition raises our ownership interest from 20 percent to 81 percent in Companhia de Alumina do Pará (CAP), an alumina refinery under development that will be supplied with bauxite from the Paragominas mine. It also gives us 51 percent of the Albras aluminium smelter, and rights in certain agreements and contracts related to these assets.

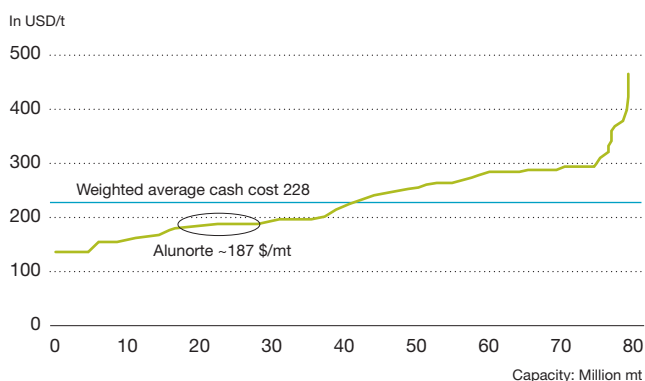
The integration process is underway, affecting roughly 4,100 employees in Brazil. A strong management team for the new business area is in place, headquartered in Rio de Janeiro, and includes a commercial office established in Lausanne, Switzerland.

### Strategic direction

Successful integration of the Vale assets and organization will be a top priority in the coming year, building a foundation for secure and profitable operations and a basis for extracting value through improving efficiency and operational excellence. Safe, sustainable practices will be at the core of our activities, promoting responsible, cost-effective operations. The acquisition secures the supply of alumina to our own operations and creates a strong platform for further organic smelter growth. A long alumina equity position enhances Hydro's value as an attractive partner for new projects, and places us in a profitable alumina market where we can influence the trend toward more sustainable pricing mechanisms.

### Strong position – ambitious targets

World cash cost curve 2009



Source: CRU

### Improve the performance of Paragominas and Alunorte

A main target in the coming years will be capacity utilization and operational efficiency, including the level of integration between the bauxite mine and alumina refinery. We will concentrate on effective production systems, rigorous productivity improvements and systematic implementation and follow-up of maintenance activities. Our aim is to achieve targeted increases in production levels and to significantly enhance the performance culture within these core activities. We want Paragominas and Alunorte to be among the top three bauxite mines and alumina refineries worldwide.

### Establish and reinforce safe and sustainable business practices

Establishing and implementing an appropriate HSE and CSR strategy reflecting our new major presence in Brazil will be on top of our agenda. Hydro's mission is to create a more viable society by developing natural resources and products in innovative and efficient ways. This principle will guide our actions as we develop our new business. In the coming year, we will work to complete a review project of the bauxite residue deposit area and then implement the improvements that are recommended by the project.

### Expansion of our alumina capacity

Our ambition is to increase our capacity of low-cost alumina, reinforcing our position as a leading global supplier. CAP, the new alumina refinery under development in Barcarena, close to Alunorte, will have an initial annual capacity of 1.9 million metric tons. Potential expansions can increase this to 7.4 million mt.

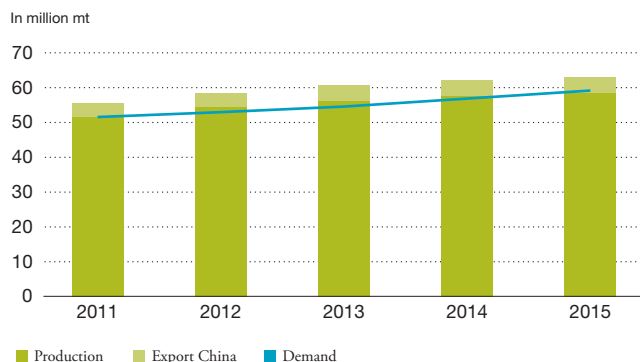
## INDUSTRY OVERVIEW

Alumina processing begins by sorting and crushing bauxite, then mixing it with caustic soda at high temperature and pressure. The resulting slurry is pumped into a digester, where a chemical reaction dissolves the alumina. This process produces a sodium aluminate solution, which is transferred into tanks to separate impurities through settling and filtration. The cooled sodium aluminate solution is then pumped into precipitators to grow alumina crystals, which are transferred to thickening tanks and eventually to kilns to remove water, producing pure alumina.

### Developments within the alumina and bauxite industry

Major bauxite-producing countries include Australia, China, Russia, Brazil, India and Guinea. In 2010, the world's 10 leading bauxite-producing countries accounted for more than 95 percent of global production of roughly 240 million mt. The sector is also highly concentrated, with the five largest mines controlling around 35 percent of global production last year. Currently, Paragominas' capacity represents about 4 percent of global production.

## A balanced alumina market but with some uncertain capacity



Alumina is one of the most significant cost elements in the production of aluminium. The alumina market is competitive, but small, compared with the primary aluminium market, because many of the major aluminium-producing companies have integrated bauxite, alumina and aluminium operations. Competition in the alumina market is based primarily on quality, the reliability of supply, and price, which are directly related to operating costs and logistics. Hydro believes that Alunorte is competitive in the alumina market because of the high quality of its alumina, its advantages in scale and technology, low energy consumption and labor costs, and efficient port facilities.

Bauxite and alumina prices have been strongly affected by developments in China, with three-to-seven-year contract prices increasing from a level of around 12 percent of the LME's aluminium reference prices in 1990 to around 14-15 percent in 2010. There also has been a shift in the alumina market toward shorter contract durations. In general, the owners of the natural resources that provide the basic raw materials for industrial commodities are taking an increasing share of profits, a trend that is expected to continue.

## OPERATIONS

### Overview

Hydro has acquired Vale's interests in alumina refining operations and projects (Alunorte and CAP), aluminium smelting operations (Albras) and 60 percent of Vale's interest in the Paragominas bauxite mining assets. All of the assets are located in Brazil.

The Paragominas mine is one of the world's largest bauxite mines based on historical output. Current nominal production capacity amounts to 9.9 million metric tons on an annual basis.

Alunorte is the world's largest alumina refinery. It is positioned in the first quartile on the industry cost curve, based on highly competitive conversion costs and an integrated bauxite supply. Alunorte has annual production capacity of approximately

6.3 million mt. As part of the Vale acquisition, Hydro increased its ownership interest in Alunorte from 34 percent to 91 percent.

Albras is a hydro-powered aluminium smelter with annual production capacity of 460,000 mt. It is among the largest smelters in the Americas with a cash-cost position in the upper second quartile on the industry cost curve. Hydro owns 51 percent of Albras, as part of the Vale acquisition.

Companhia de Alumina do Pará (CAP) is a joint-venture project for the development of a new alumina refinery close to Alunorte. Hydro increased its ownership interest in CAP from 20 percent to 81 percent following the Vale acquisition.

The business and assets comprising Vale Aluminium also include the rights of Vale and its subsidiaries in certain shareholders' agreements, shareholder loans, off-take agreements and other commercial agreements relating to the interests described above.

### Bauxite mining

Operations at the Paragominas mine, in the Brazilian state of Pará, commenced in the first quarter of 2007 and began supplying raw material to the Alunorte alumina refinery at the same time. The first expansion of the Paragominas mine (Paragominas II) was completed in the second quarter of 2008. The mine has a nominal annual production capacity of 9.9 million mt of 12-percent moisture bauxite. The site is connected to a 244-kilometer slurry pipeline with an annual capacity of 14.9 million mt.

The following table includes production volumes for the Paragominas mine (on a 100 percent basis):

In millions of mt	Mine type	2010	2009	Nominal capacity	Recovery rate
Final bauxite production	Open pit	7.5	6.2	9.9	70%

Vale has performed a feasibility study for a second expansion, Paragominas III, which would increase production capacity by 5.0 million mt per year.

### Alumina

Alunorte produces alumina by refining bauxite supplied by Vale and sourced from MRN and the Paragominas mine. In 2009 and 2010, respectively, Alunorte sourced approximately 58 and 48 percent of its bauxite requirements from MRN with the remainder acquired from the Paragominas mine. Alunorte is the largest alumina refinery in the world and among the lowest cost producers. The refinery has a nominal production capacity of 6.3 million mt per year, following the most recent expansion completed in the second quarter of 2008. Alunorte supplies alumina to the Albras smelter, which is located nearby in Barcarena in the state of Pará. Alunorte and Albras share infrastructure and other resources. Alunorte supplies alumina to Hydro and, prior to the completion of the acquisition, to Vale, which sold alumina to unaffiliated customers.

The following table includes production volumes for Alunorte (on a 100 percent basis):

In millions of mt	2010	2009	Nominal capacity
Production	5.8	5.9	6.3

CAP, a new alumina refinery to be located in Barcarena, close to Alunorte, is under development in a joint venture formerly between Vale, Hydro and Dubai Aluminium Company Limited. The refinery will have initial annual capacity of 1.9 mt with potential for expansions up to 7.4 million mt, over four phases. The plant will be supplied with bauxite from the Paragominas mine.

### *Aluminium*

The Albras smelter, located in Barcarena, in the state of Pará, is one of the largest aluminium plants in the Americas, with a nominal capacity of 460,000 mt of primary aluminium per year. Alunorte supplied 100 percent of the alumina requirements for Albras in 2009 and 2010. Albras commenced operations during 1985-86 and produces standard metal ingots.

Albras purchases electricity from the Tucuruí hydroelectric power plant located on the Tocantins River in Tucuruí, Brazil. This plant, which is owned by Eletronorte, is the only source of electrical power in the region able to deliver the quantities required for Albras' operations. Albras consumes approximately one-fifth of the non-peak period output of the Tucuruí plant.

The following table includes production volumes for the Albras aluminium smelter (on a 100 percent basis):

In millions of mt	2010	2009	Nominal capacity
Production	446	450	460

### *Customers and sales*

**Bauxite** – The Paragominas mine sells all of its production to Alunorte, which corresponded to about 42 and 52 percent of Alunorte's bauxite requirements in 2009 and 2010, respectively.

**Alumina** – The majority of Alunorte's produced alumina is purchased by its shareholders on a take-or-pay basis in proportion to their respective ownership interests. The shareholders pay the same price, which is determined by a formula based on the price of aluminium for three-month futures contracts on the LME. Part of Vale's share of Alunorte's alumina production is used to supply the Albras smelter. The remainder of Vale's share of production prior to completion of the acquisition was sold to customers in Argentina, Canada, Egypt, Norway, the United States and other countries.

**Aluminium** – Each of Albras' shareholders must purchase on a take-or-pay basis all of the aluminium produced by Albras in proportion to their ownership interests. Formerly, Vale's share was partly sold to customers in the aluminium industry in domestic markets, with the remainder sold in international markets, mainly Asia and Europe.