



Bauxite & Alumina

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Capital Markets Day 2016

Hydro is Brazil's #1 aluminium company

No.1 in
bauxite



Hydro owns 5% of Brazil's largest bauxite mine and 86,3% of Brazil's second largest bauxite mine

No.1 in
alumina



Hydro owns 92.13% of Brazil's and the world's largest alumina refinery

No.1 in
aluminium



Hydro owns 51% of Brazil's and South-America's largest aluminium smelter in operation

Hydro has 50% market share in Brazilian bauxite trading and refines more than half of Brazil's alumina



Bauxite & Alumina: Accelerating performance



Participation in Barcarena Urban Development Plan



Paragominas awarded as best Brazilian mine by EXAME



Commissioning of press filters at Alunorte

CMD 2015

CMD 2016

All-time low implied alumina cost



Vale/Hydro negotiations on MRN halted



Ball mill and pipeline repairs completed



Highest 12-month average production



Bauxite & Alumina strategic priorities

Aiming for operational and commercial leadership

Better

- Strive for an injury free environment
- Continue operational improvement drive, ensure world class operations
- Price bauxite and alumina on own fundamentals

Bigger

- Secure and develop resources for future decades
- Further mature CAP project and Paragominas expansion
- Develop production creep potential at Alunorte

Greener

- Further improve organizational capabilities and HSE performance
- Deliver on reforestation ambition 1:1 in 2017

Improvement program ahead of 2016 plan, 2019 target unchanged

Strong progress on operational and commercial efforts



Improvement categories

Alunorte

- Debottlenecking Alunorte to above nameplate capacity
- Improve energy consumption and matrix
- Reduce fixed costs

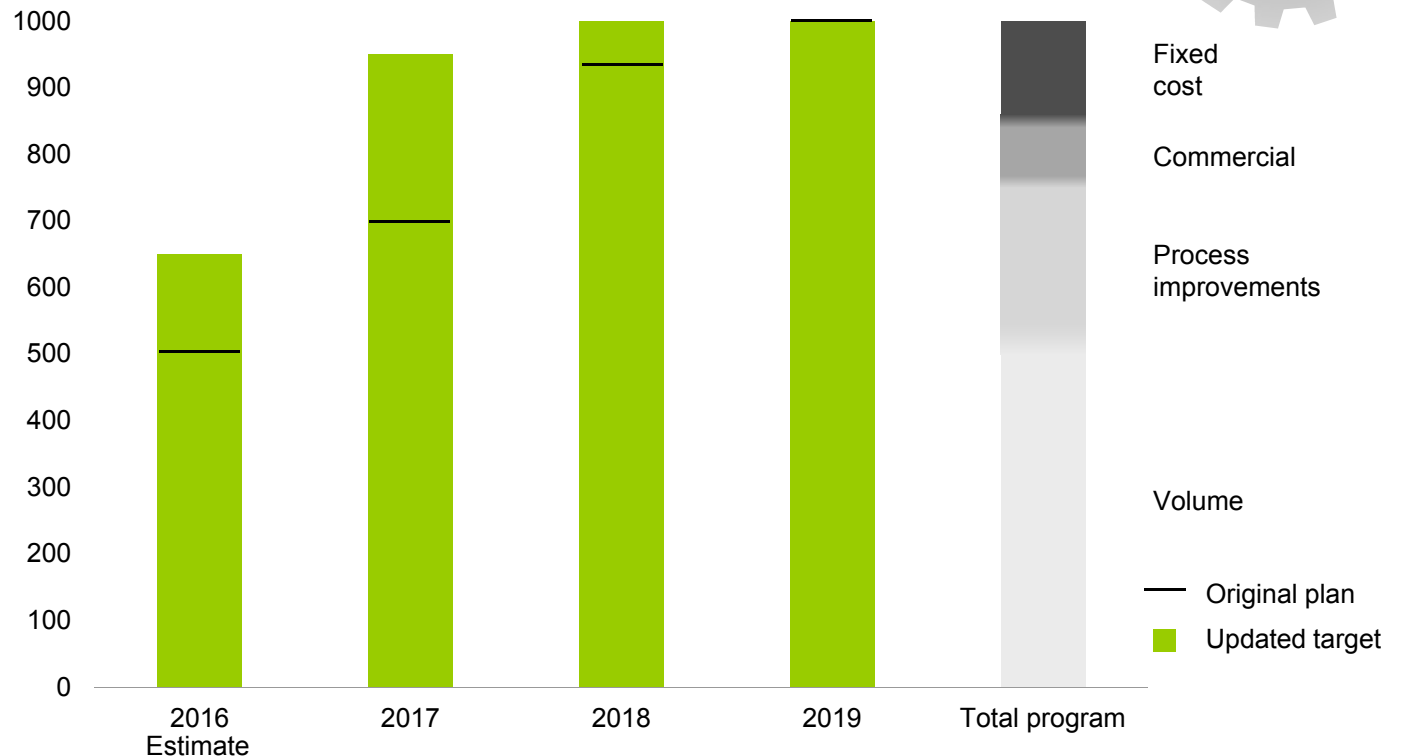
Paragominas

- Support production above nameplate capacity
- Reduce fixed costs

Commercial

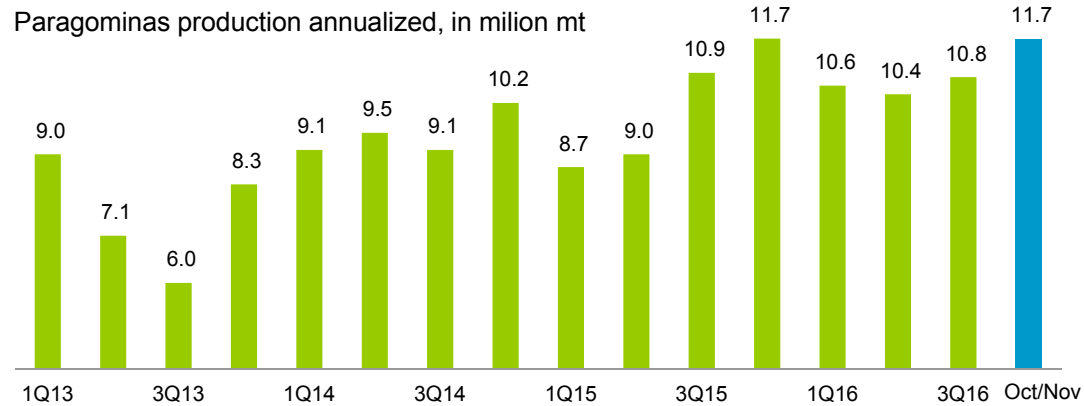
- Reduce demurrage costs
- Lift optimization margin

Improvements in NOK million



Paragominas: Supporting production above nameplate capacity

Paragominas production annualized, in million mt



YTD 2016 production up 5% from strong 2015

- Successfully implemented Bauxite & Alumina Business System
- Improved equipment conditions, operating standards and process control
- Improved ore quality control in the mining process

Tailing dam investments on track



- BRL 600 million investment - on time and budget
- Improved safety of disposal areas, reduced environmental footprint and cost due to higher solid concentration of tailings

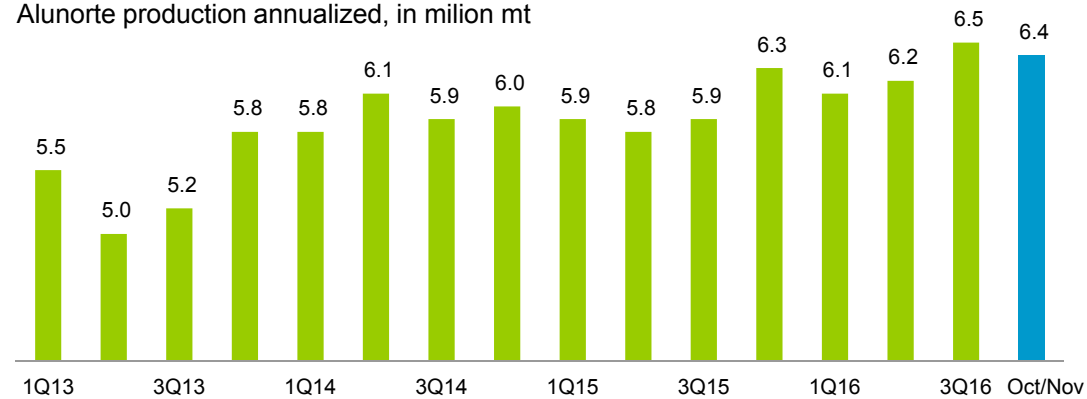
Reforestation ambition well on track



- 1:1 reforestation by 2017, progressing according to plan
- Research partnerships creates basis for state-of-the-art approach to mining rehabilitation

Alunorte: Record run-rate production above nameplate capacity

Alunorte production annualized, in million mt



Significantly improved production stability

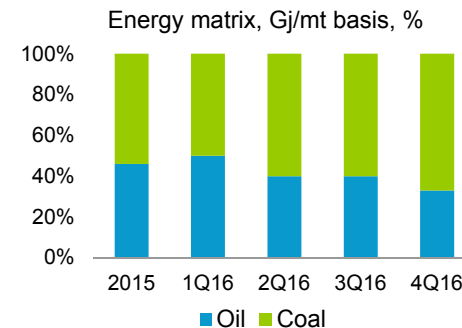
- 6.3 million mt last 12 months production at nameplate capacity
- Improved equipment effectiveness and process stability based on Bauxite & Alumina Business System
- Further debottlenecking needed for 6.6 million mt target

Red mud deposit investments on track



- BRL 1 billion investment - on time and budget
- State-of-the-art dry disposal of bauxite residue using press filtration
- Reduced required storage area, environmental footprint and cost

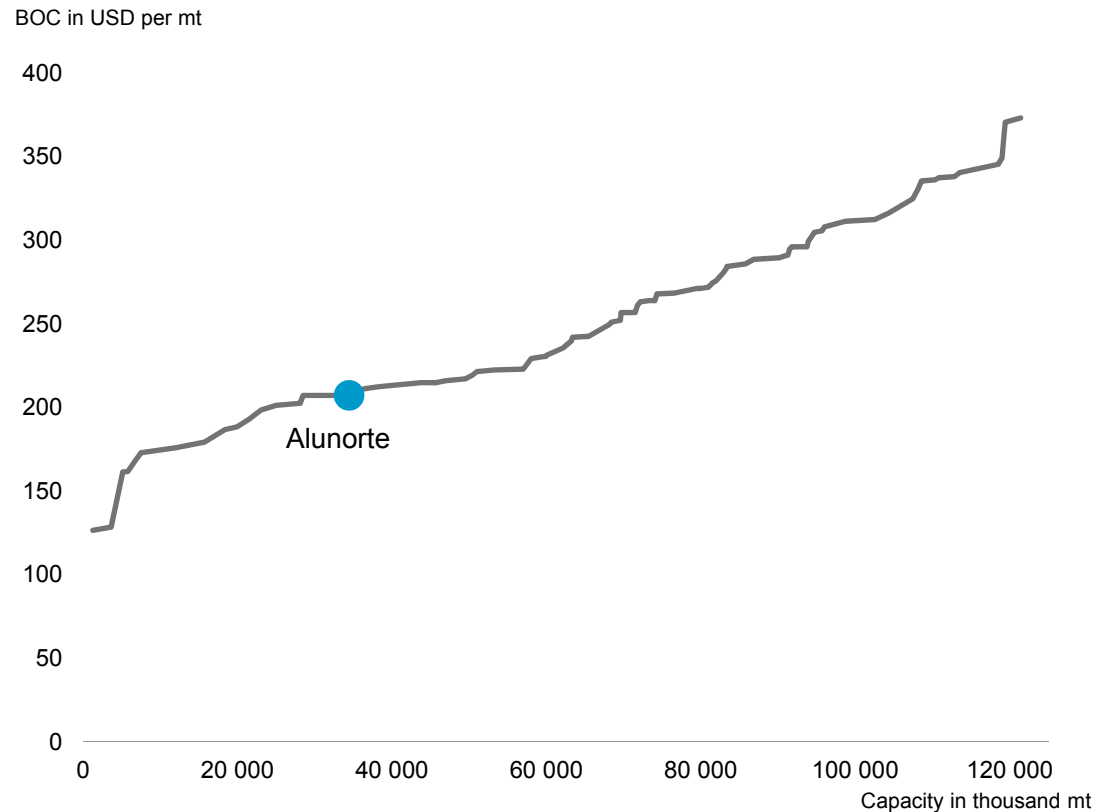
Optimized energy mix and raw material efficiency



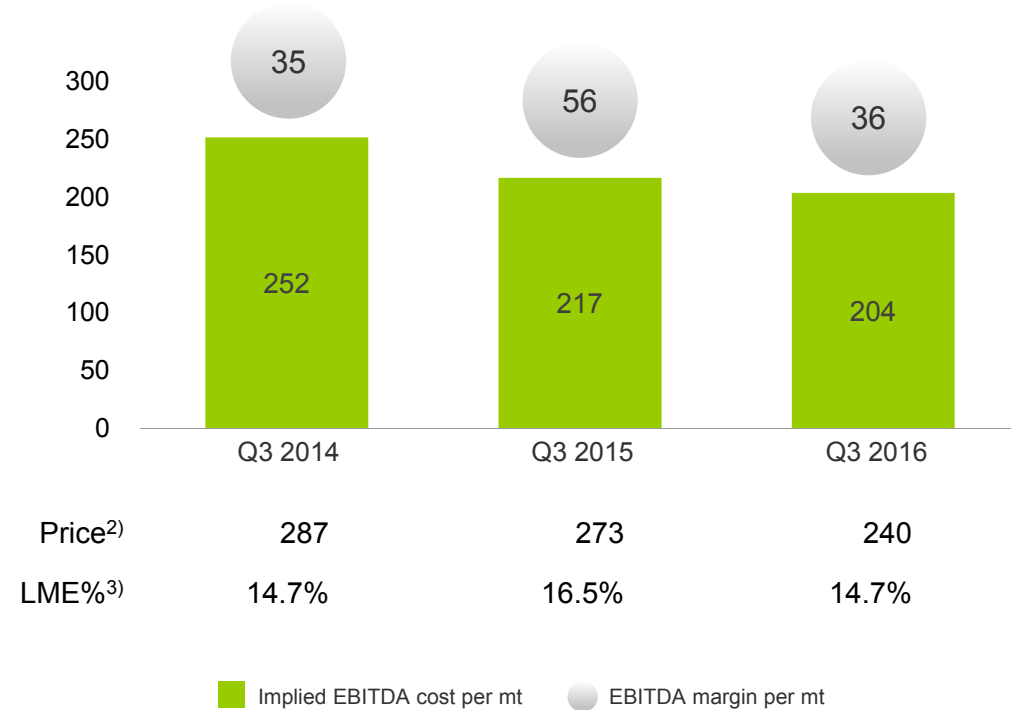
- Energy cost improved by 8% compared to Q3 2015
- Completed retrofit of 2 coal boilers
- Evaluating potential for usage of gas

Competitive alumina cost position

Alumina cash cost curve, USD/mt



Implied alumina cost and margin, USD/mt ¹⁾



Source: CRU, Hydro

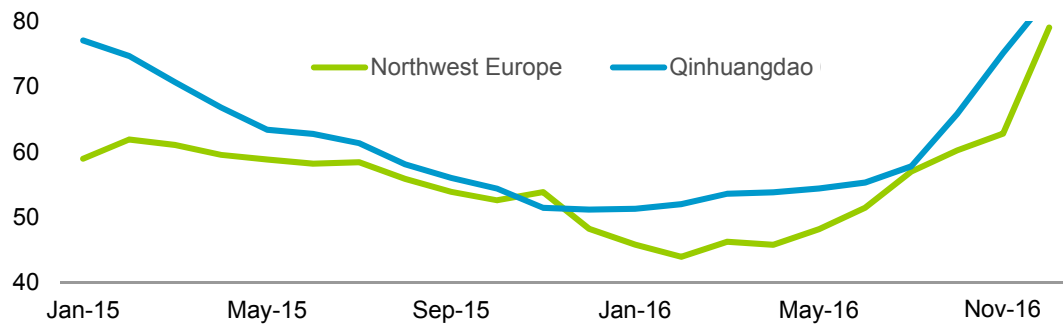
- 1) Realized alumina price minus underlying EBITDA for B&A, per mt alumina sales
- 2) Realized alumina price
- 3) Realized alumina price as % of three month LME price with one month lag

China driving alumina prices up

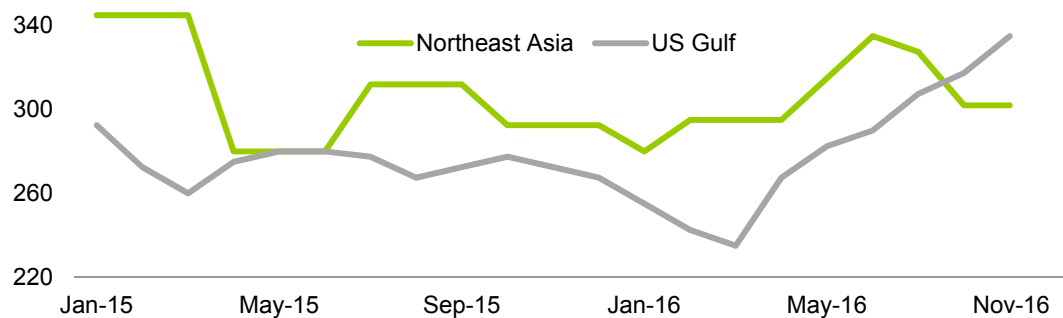
Key factors: Chinese smelter restarts on higher metal prices and seasonal inventory build-up

Raw material costs going up – lifting the floor

Coal prices, USD per mt

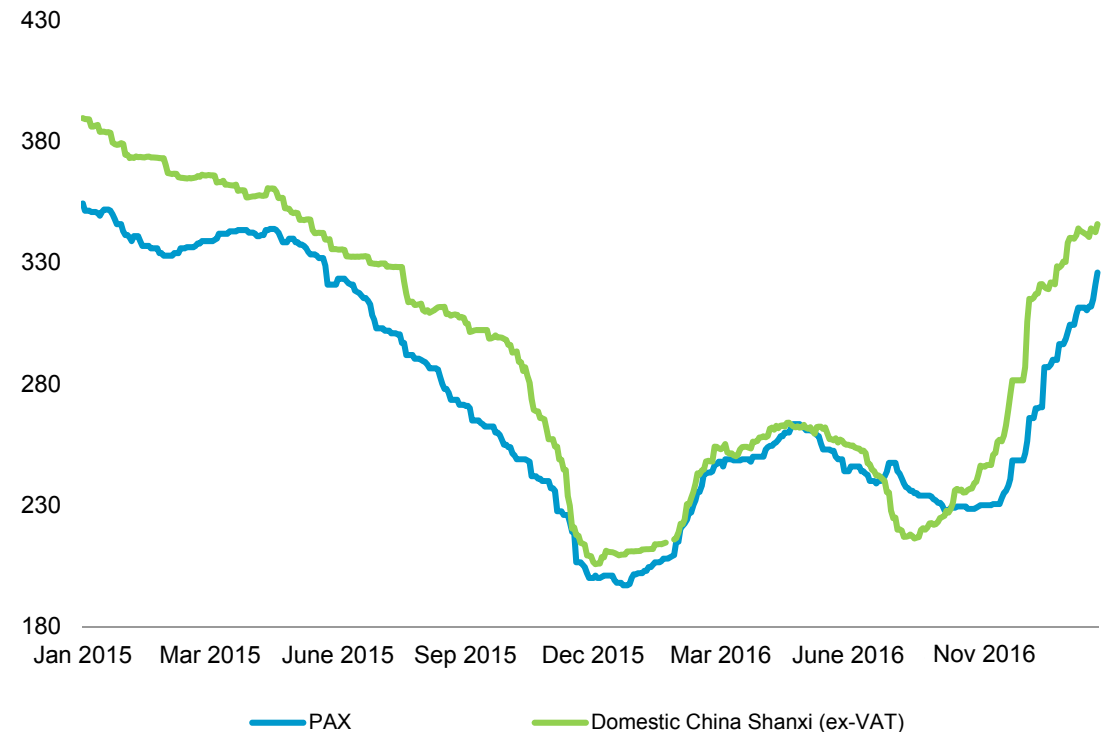


Caustic soda prices, USD per mt



Increased volatility from the Chinese market

PAX & China (Shanxi) domestic alumina price, USD per mt

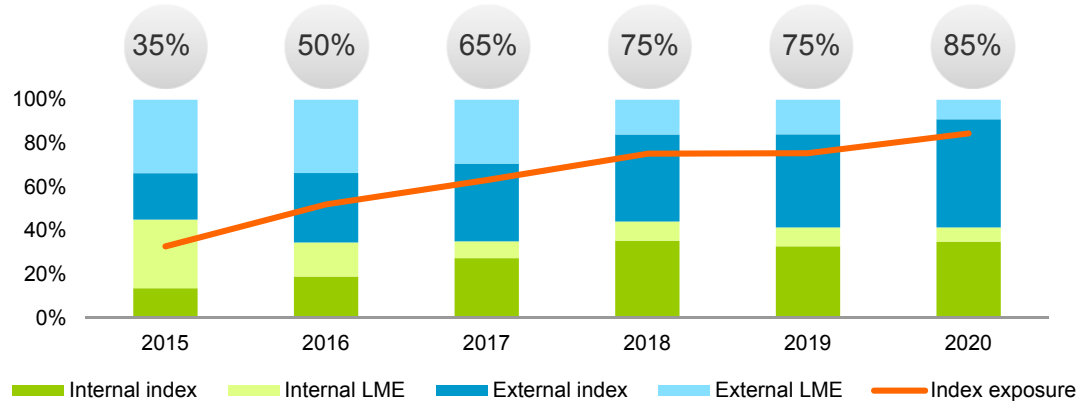


Source: Platts, IHS

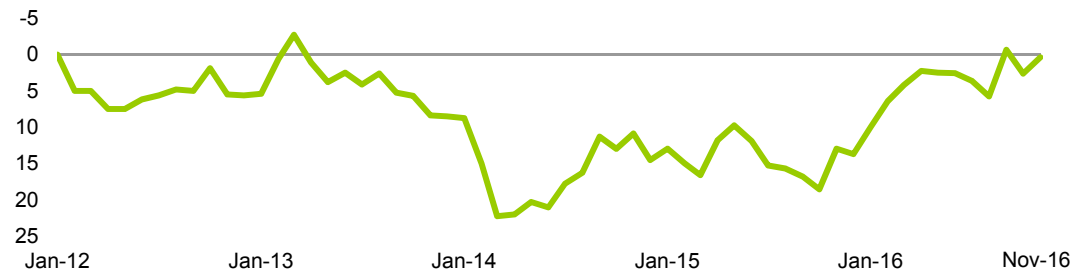
Pricing alumina and bauxite on own fundamentals

Platts alumina index well established as the common pricing mechanism

Hydro alumina sales exposure to index pricing



Alumina Atlantic discount*, USD per mt



Source: CRU

* Alumina Atlantic discount is the difference between Alumina Price Index FOB Western Australia and Atlantic Basis index (ABP) FOB Brazil

Alumina

- New contracts: 100% sold on index, except Hydrate and short-term contracts, normal terms 2-10 years
- LME-linked contracts: priced at 14-15% of LME 3M
- External sales 3-4 million mtpa: $\frac{3}{4}$ Atlantic and $\frac{1}{4}$ Asia

Bauxite

- Mostly 3-4 year contracts based on % of PAX + fixed USD/mt element
- Premium quality bauxite
- External sales 2.5-3.5 million mtpa: $\frac{3}{4}$ Atlantic and $\frac{1}{4}$ Asia

Atlantic Alumina market

- Discount to Pacific market reduced due to refinery closures in the Atlantic

Strong commercial organization maximizing the value of B&A assets

Strategic sales and purchases to capture long-term value



- Secure LT-sales contracts (Index & CIF terms)
- Increased focus on the Hydrate market
- 3rd party sourcing to strengthen global market share and optimization potential

Utilizing China domestic entity



- Established in May 2015
- Improved market intelligence and customer insight due to proximity to the Chinese market
- Potential to increase margins

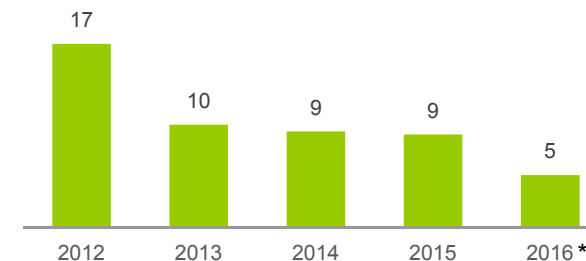
Supply chain optimization



- Maximize value of large shipment sizes
- Trading & swapping to reduce logistical cost
- Freight optimization

Reduced demurrage cost on optimized scheduling

Demurrage costs Alunorte, USD million



- Close cooperation between operations and commercial
- Focus on improved scheduling

* YTD October 2016 annualized

Two key focus areas for commercial in 2016

Pursuing attractive market opportunities to lift margins



Hydrate alumina market (chemical grade)

- Hydrate - alumina before the calcination process
- More stable hydrate prices compared to metal grade alumina
- US: price negotiated annually - fixed in USD/mt
- New long-term sales contracts established in the US
- Shipments to Japan & US in 2016: 600-750,000 tons*

Examples of products



Utilizing China domestic entity

- Gaining market intelligence and customer insight
- Taking advantage of price arbitrage between China and rest of the world
- Warehousing capability and increased flexibility
- Selling in smaller lots & local currency – more than doubling number of customers
- Total sales to China 2016:
 - Alumina: ~0.5 million mt
 - Bauxite: ~1.4 million mt



* In alumina equivalent tons. Total sales of hydrate: 600-750,000 tons, equivalent to 400-500,000 tons of alumina using a factor of 0.654

Bauxite & Alumina mid-term goals

Creating shareholder value through efficient and commercial use of raw materials

Ambitions	Target	Timeframe	Progress ¹	Status
• Improve safety performance, strive for injury free environment	TRI <2	2020	1.4 ²	●
• Realize ongoing improvement efforts <i>Better Bauxite&Alumina</i>	BNOK 1.0	2019	650 MNOK	●
• Lift alumina production through stabilization and debottlenecking	6.6 mill mt/yr	2018	6.3 mill mt/yr ³	●
• Lift bauxite production through debottlenecking	11 mill mt/yr	2018	10.8 mill mt/yr ³	●
• Shift alumina sales to PAX-based pricing	>85 % PAX ⁴	2020	~50% PAX ⁵	●
• Deliver on reforestation ambition	1:1	2017	On track	●

Better Bigger Greener

1) Based on 2016 estimate unless stated otherwise
 2) YTD Oct-2016, own employees
 3) YTD 2016 annualized
 4) Based on annual sourced volumes of 2.3 million tonnes
 5) Based on sourcing volumes of 2.5 million tonnes for 2016

● Ambition on track and on target
 ● Ambition behind plan, but on target
 ● Ambition will not meet the target

