Kitimat Site Tour

Senate Standing Committee on Environment, Energy and Natural Resources
October 4, 2016
About Rio Tinto

Over **35** sites in Canada

$6.9 Billion

Total investment into aluminum operations over the last 5 years

Canada’s largest mining and metals company
Aluminium & Sustainability

• Aluminium is one of the world’s most versatile and environmentally friendly metals

• It requires less energy to manufacture and transport products made from aluminium than most other metals

The use of one kilogram of aluminium to replace heavier materials in a car or light truck can save a net 20 kilogram of CO$_2$ over the life of the vehicle.
Video

https://www.youtube.com/watch?v=68FIYtrtnCQ
Renewable hydropower: The hallmark of our sustainable operations

Rio Tinto Aluminium’s energy portfolio is 97% carbon free, the cleanest in the industry and mainly from self-generated hydropower facilities.
Global Perspective: GHG per tonne of aluminium produced

Source: International Aluminium Institute

Direct and indirect GHG emission per ton of primary aluminum - tCO$_2$e / T Al
Lowest Carbon Footprint Aluminium Made in BC

- Production capacity will increase by 48% (420,000 tons)

- As a result of Rio Tinto's AP Technology, we have been able to reduce:
  - Energy consumption by 33% per ton of aluminum produced.
  - Overall emissions by nearly 50%
  - GHG emissions intensity by 50%, making Kitimat one of the lowest GHG emissions in aluminum production worldwide

- The workforce of the modernized smelter will be comprised of about 1,000 people
New versus old technology

...one if the most modern smelters in the world

<table>
<thead>
<tr>
<th>Old technology</th>
<th>New technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal production (tonnes)</td>
<td>240,000T</td>
</tr>
<tr>
<td>Efficiency</td>
<td>86 - 88%</td>
</tr>
<tr>
<td>Power consumption (Kwhrs/kg)</td>
<td>18.0 - 19.0</td>
</tr>
<tr>
<td>Operating amperage (KA)</td>
<td>121KA</td>
</tr>
<tr>
<td>Numbers of Cells</td>
<td>780</td>
</tr>
<tr>
<td>Total Power required</td>
<td>565MW</td>
</tr>
<tr>
<td>Employees</td>
<td>1500</td>
</tr>
<tr>
<td>Total Power required</td>
<td>420,000T++</td>
</tr>
<tr>
<td>Efficiency</td>
<td>93%</td>
</tr>
<tr>
<td>Power consumption (Kwhrs/kg)</td>
<td>13.15</td>
</tr>
<tr>
<td>Operating amperage (KA)</td>
<td>405KA</td>
</tr>
<tr>
<td>Numbers of Cells</td>
<td>384</td>
</tr>
<tr>
<td>Total Power required</td>
<td>~710MW</td>
</tr>
<tr>
<td>Employees</td>
<td>~1000</td>
</tr>
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</table>

...conversion to AP technology will increase production while reducing greenhouse gas emissions
What was the modernization all about?

**Old**

'VS Soderberg'

- Emissions (PAH)
- Electrical Power
- Anode Paste (Coke and Pitch Briquettes)
- Emissions (Fluoride, GHGs)
- Alumina ore
- Gas Skirt
- Crust
- Electrolyte bath Aluminum
- Cathode
- Electrical Power

**New**

'Prebake AP 3X+'

- Computer controlled Alumina ore feed
- Captured Fluoride gases
- Hood enclosing pot
- Pre-bake anode
- Electrolyte bath Aluminum
- Cathode
- Electrical Power
Most studied smelter in the world

ASSESS the program as needed
DESIGN with MOE, Haisla, third party experts and stakeholders
IMPLEMENT through the project and operations
MONITOR extensively and report continuously
EVALUATE data against thresholds
ADJUST monitoring and mitigate if required

Environmental Effects Monitoring Program - An Adaptive Management Approach

What we're monitoring:

Air Quality
- Monitor air quality at air monitoring stations

Human Health
- Annual health risk assessment

Soils
- Long-term soil monitoring statistics

Water (Lakes and Streams)
- Water chemistry and pH monitoring

Vegetation
- Annual sampling; sensitive species monitoring
**SO$_2$ emissions are similar to before**

Some key findings from monitoring conducted thus far:

- SO$_2$ emissions measured in Kitimat are the same or lower than when the old smelter was running.
- On average SO$_2$ emissions measured at residential monitoring stations are LESS than 1 ppb (part per billion). Well below the Ministry of Environment’s interim guideline of 70 ppb.
- SO$_2$ emissions measured at the Rio Tinto Haul road monitoring station are 20 times lower than the Work Safe BC standard for industrial sites.
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