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Via - <https://consult.industry.gov.au/low-emissions-technology-statement-2022>

3 February 2022

Dear Dr Finkel

Australian Aluminium Council Response to Low Emissions Technology Statement 2022

The Australian Aluminium Council (the Council) represents Australia's bauxite mining, alumina refining, aluminium smelting and downstream processing industries. The aluminium industry has been operating in Australia since 1955, and over the decades has been a significant contributor to the nation's economy. It includes five large (>10 Mt per annum) bauxite mines plus several smaller mines which collectively produce over 100 Mt per annum making Australia the world's largest producer of bauxite. Australia is the world's largest exporter of alumina with six alumina refineries producing around 20 Mt per annum of alumina. Australia is the sixth largest producer of aluminium, with four aluminium smelters and additional downstream processing industries including more than 20 extrusion presses. Aluminium is Australia's highest earning manufacturing export. The industry directly employs more than 17,000 people, including 4,000 full time equivalent contractors. It also indirectly supports around 60,000 families predominantly in regional Australia.

Interconnection with Priority Technologies

The Council welcomes the opportunity to provide feedback on the 2021 Low Emission Technology Statement (LETS) and to provide input to guide the focus for the 2022 LETS. Aluminium is one of the six priority technologies in the 2021 LETS. The 2021 LETS provided a welcome increase in focus on not just aluminium smelting, but on the aluminium value chain within Australia; recognising Australia as the world's largest producer of bauxite and the world's largest exporter of alumina.

The decarbonisation pathways for bauxite, alumina and aluminium are interdependent with at least three of the other priority technologies:

1. energy storage – electricity from storage for firming under \$100 per megawatt hour (MWh); and
2. ultra-low-cost solar electricity generation at \$15 / MWh; and
3. clean hydrogen – production under \$2 per kilogram (kg).

Subject to the evolution of other technologies, the decarbonisation pathway may also involve carbon capture and storage (CCS), however, this pathway is not yet as clearly defined. The Council believes this interconnectivity between pathways will assist in technology development and deployment.

The Council has produced a series of five factsheets¹, outlining:

1. Australia's role in a global aluminium decarbonisation pathway;
2. How Australian bauxite will help meet global demand for aluminium;
3. Australia's role in developing low carbon alumina refining technologies for the world;
4. The role of Australia's aluminium smelters in providing baseload stability in a decarbonising grid; and
5. Decarbonisation of Australia's electricity supply, which the Council sees as the single biggest opportunity to decarbonise the vertically integrated aluminium industry.

The Council intends to update these annually; reflecting not only progress in decarbonisation in the industry; but also updating the industry's views of the evolution of decarbonisation technologies, based on research undertaken in Australia and through global partnerships.

Stakeholder Questions

1. *Where can government make the biggest difference and further incentivise investment in low emissions technologies, particularly the priority technologies identified in the Roadmap?*

Research, technology trials and commercialisation pilots, outlined in detail in the factsheets¹, being undertaken covers the mine to market production aluminium in Australia. The single biggest opportunity across all three commodities; bauxite, alumina and aluminium; is in the decarbonisation of Australia's east and west coast electricity markets. Therefore, measures to incentivise investments which deliver competitively priced, firm, zero emissions electricity to industrial users will be core to the successful decarbonisation of aluminium as a priority technology.

The industry believes that the biggest challenge is in long term storage at scale, which can address periods when there is both low solar and low wind output (dunkelflaute) which is beyond the current storage term of pumped hydro, batteries and transmission solutions.

2. *How does Australia better support consumer and industry demand growth for low emissions technologies both domestically and internationally?*

As the Government has highlighted, the single most important driver of demand growth will be competitive pricing for low emissions technologies. There may also be important opportunities to support early-stage technology rollouts to reduce risk for early adopters.

3. *What are the global trends and competitive advantages that should be considered for the priority technologies?*

Aluminium is one of the commodities most widely used in the global transition to a clean energy future². While traditional uses of aluminium will dominate demand, new aluminium products including high purity alumina (HPA), aluminium alloys and aluminium salts are continuing to be developed to meet emerging technology needs. Australia is well positioned to use its existing backbone of value adding industries in Australia to develop new industries which will meet these future needs. For example, multiple³ HPA projects under development in Australia have strong connections with the existing industry.

The Aluminium Stewardship Initiative provides the industry with a global certification scheme which includes not just carbon content – but the full range of Environmental, Social, and Governance issues for all parts of the value chain. The certification standards are currently under review with updates expected to be

¹ <https://aluminium.org.au/recent-releases/factsheets/>

² <https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action>

³ Examples include projects in Gladstone - <https://alphahpa.com.au/>, Kwinana - <https://www.fyiresources.com.au/>, and Bell Bay - <https://pelotonresources.com.au/>

publicly released in 2022⁴. Additionally, the global industry is differentiating products on the basis of the carbon credentials⁵.

As noted above, measures to support these trends require competitively priced, firm, zero emissions electricity to industrial users. This should be considered a priority technology.

4. *What are the industrial sectors (other than steel and aluminium) that require technology innovation?*

The Council welcomed the recognition of the role of alumina, as a part of the vertically integrated value adding process in Australia; which is an independently traded commodity.

Australia has more than 50 years of technical experience in bauxite mining and alumina refining technologies. This experience helps not only us, but our customers of bauxite, alumina and aluminium, to reach their sustainability goals. Global research headquarters for alumina for Alcoa, Rio Tinto and South32's Worsley Alumina are all based in Australia, helping develop new technologies for the world.

Australia's alumina already has some of the lowest emissions in the world, with an average emissions intensity for alumina of 0.7 t CO₂-e/t compared to the global industry average of 1.2 t CO₂-e/t. As globally leading low emission alumina trials are being conducted here, Australia is leading the adaptation of brownfield alumina refineries to even lower carbon footprints.

5. *What are the most promising emerging low emissions technologies and why? Do they meet the four filters identified in the Roadmap to elevate to a priority technology?*

- a. *Abatement potential. How big are the potential emissions reductions from this technology?*
- b. *Economic benefit. What are the potential economic benefits for Australia of deploying this technology at a large scale? Benefits include creating and preserving jobs, especially in regional areas.*
- c. *Australia's comparative advantage. Does this technology play to Australia's strengths? Our strengths include abundant energy and mineral resources, skilled workers, strong institutions and trusted trading relationships with major energy consumers.*
- d. *Where government can make a difference. Will government investment help develop and deploy this technology? This includes whether government action will help accelerate cost reductions.*

The single biggest opportunity to decarbonise the energy intensive Australian vertically integrated aluminium industry is through the combination of electrification of existing processes and decarbonisation of the electricity supply. This has significant abatement potential, strong economic benefit given the significant regional job footprint of the industry, allows value adding to Australian resources and is clearly an area where Government can make a difference.

6. *What other enabling technologies will be integral to deployment of low emissions technologies in Australia, and why? What could Government do to support their uptake?*

Australia's grid-connected mines, refineries and particularly smelters perform an enabling function in grid stabilisation which helps with increased penetration of variable renewable electricity. The carbon intensity of the Australian grid is declining rapidly⁶, with this increased penetration of variable renewables. Industry also has the opportunity, as part of contract renewal, to source firmed renewable electricity from on grid sources or behind the meter sources and have signalled their intentions to do so⁷.

⁴ <https://aluminium-stewardship.org/asi-standards-revision/>

⁵ For example: <https://www.riotinto.com/-/media/Content/Documents/Products/Aluminium/RT-Aluminium-RenewAl-fact-sheet.pdf?rev=f89b8d105e15400fa053d58a364c3be8>,

<https://www.alcoa.com/sustainability/en/pdf/EcoSource.pdf>, <https://allow.rusal.com/>

⁶ <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/market-operations/settlements-and-payments/settlements/carbon-dioxide-equivalent-intensity-index>

⁷ <https://www.riotinto.com/-/media/Content/Documents/Invest/Presentations/2021/RT-Investor-Seminar-2021-combined.pdf?rev=2e127f507f204ecc81e2d22527949560>

Currently, the industry’s indirect emissions associated with the consumption of grid purchased electricity are around 18 Mt CO₂-e, of which 95% is from the production of primary aluminium (**Figure 1**). However, technologies which electrify the digestion process in alumina refineries could offset an additional 11 Mt CO₂-e of Scope 1 emissions.

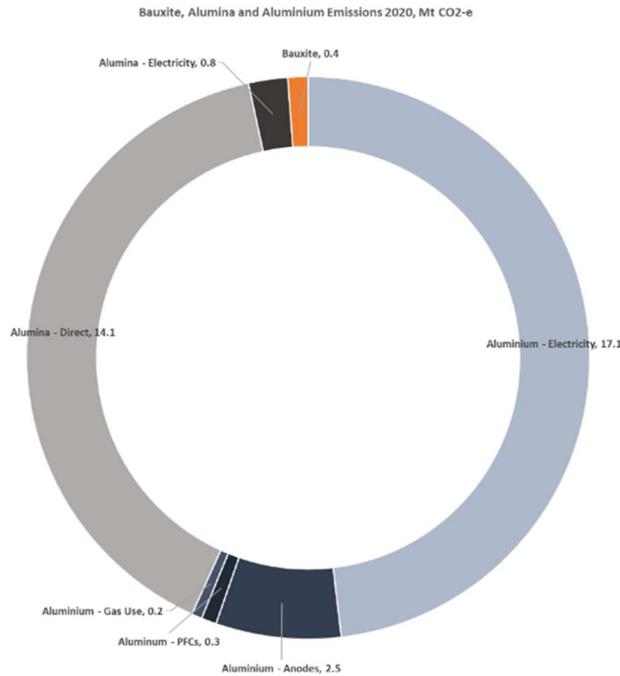


Figure 1. 2020 Industry Emissions (Mt CO₂-e)

The electrification of existing industry, such as alumina refining, combined with the development of new electricity intensive industries, such as hydrogen, will require substantial volumes of electricity delivered reliably, affordably and at scale. While the energy storage and ultra-low-cost solar electricity generation priorities recognise this, they do not address the scale of the infrastructure required to support this transition. The Council is concerned that if energy infrastructure is delivered in the manner and at the pace it has historically, this may become the rate limiting step in the transition⁸.

The Council believes it would be appropriate to develop a combined infrastructure/transmission target to support the deployment of the electrification which will be required to achieve net zero by 2050. While the Government currently has targets for energy storage, solar generation and hydrogen costs; it is the delivered cost of zero carbon electricity at industrial scale to facilities, which will enable the greatest transformation of the aluminium sector.

The Council acknowledges that a “delivered cost of zero carbon electricity at scale” target would combine multiple technologies; this is no different to other priority technologies such as low carbon materials which also combine require multiple technologies.

7. Aside from our established partnerships, how would you like to see Australia working with other international partners on low emissions technologies?

Recent announcements of partnerships focussed on low emissions technologies particularly with the Government of Japan are welcomed by the Australian aluminium industry, as a number of Australian facilities are joint ventures with Japanese participants.

⁸ <https://www.worley.com/~media/Files/W/Worley-V3/documents/our-thinking/from-ambition-to-reality/from-ambition-to-reality-report.pdf>

8. *What information would you like to see to demonstrate how progress towards the stretch goals is being made? Does the impact evaluation framework have any gaps?*

The Council does not have any specific feedback but would appreciate the opportunity to continue to work with the Government on metrics to assess progress for low emissions materials.

9. *What were you expecting in LETS 2021 that wasn't there?*

The Council welcomed the increased focus on alumina, which was absent in the 2020 LETS. There were no items the Council expected, which were not included.

10. *Was LETS 2021 presented in a way that made it easy to understand and access?*

The Council found the information in the 2021 LETS and Australia' Long Term Emissions Reduction Plan, easy to follow and the evolution of the program from 2020 was evident.

11. *Are there any other opportunities and or challenges to low emissions technology development and deployment that should be considered?*

Australia has a unique opportunity to leverage the critical clustering of skills, resources and energy demand in the regions in which aluminium smelters and alumina refineries are located. This will require co-ordination and focus of government effort. It would be easy to make too many investments, across too many locations, dissipating effort and not achieving the synergies needed for the step change outcomes required to achieve the Government's low emission technology objectives.

Conclusion

The Council seeks a national climate and energy policy framework which is transparent, stable and predictable, while maintaining the economic health of the nation including vital import and export competing industries. The Technology Investment Roadmap, as a cornerstone of Australia' Long Term Emissions Reduction Plan is a key aspect of this policy framework is of critical importance to the Council and its members. The Council is happy to provide further information on any of the issues raised in this submission.

Kind regards,



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