



AUSTRALIAN
ALUMINIUM
COUNCIL LTD

Level 1,
18 National Circuit
Barton ACT 2600
Ph: 02 6267 1800
info@aluminium.org.au

Climate Change Authority
<https://consult.climatechangeauthority.gov.au/economic-modelling>

15 September 2023

Dear Chair

Re: Economic modelling of Australia's potential emissions reduction pathways

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 six 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 seventh 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 19,000 people, including 6,600 full time equivalent contractors. It also indirectly supports around 60,000 families, predominantly in regional Australia.

The Council welcomes the opportunity to respond to the Climate Change Authority's (the Authority) consultation paper on Economic modelling of Australia's potential emissions reduction pathways (the Paper). This submission is made in addition to the Council's submission¹ to the CCA's Issues Paper earlier this year.

The Authority is seeking feedback to on its proposed modelling approach to support its advice to Government for Australia's 2035 Nationally Determined Contribution under the Paris Agreement. This modelling will help the Authority understand the opportunities and costs for the Australian economy that are associated with different emissions reduction scenarios. In responding to the issues raised in the Paper, the Council will respond only to selected questions for consideration.

What are your views on the two modelling questions? Are there other questions the authority should explore through economic modelling to inform its advice?

The Authority has identified two key questions to answer with this modelling exercise:

1. What are the likely economic effects on Australia of different emissions pathways to net zero relative to Australia's current level of ambition?
2. What are the likely emissions pathways, outcomes, risks and opportunities for different parts of the economy under different national emissions pathways to net zero?

As the Authority considers how to answer these questions, it is worth noting that there are a number of quite divergent scenarios which may unfold in the next few years. For example, aluminium is one of the

¹ <https://aluminium.org.au/wp-content/uploads/2023/07/230630-Aluminium-CCA-Issues-Paper.pdf>

commodities most widely used in the global transition to a clean energy future² and it is expected that by 2050, global demand for aluminium is expected to nearly double³. While an increasing proportion will be met through recycled aluminium, there will still be a need for increased production of primary aluminium requiring a comparable increase in global bauxite mining and alumina refining rates, which should support continued or even increased production in Australia.

However, producing substantial quantities today, does not mean supply chains are not vulnerable to change⁴. Historically, Australia has been able to compete against Chinese alumina and aluminium on cost, but that advantage has deteriorated materially in recent years. For example, challenging market conditions currently facing the industry, including domestic carbon costs and the capital requirements for decarbonisation have led to the impairment of some Australian alumina refineries⁵.

Decarbonisation of electricity supply is the biggest opportunity and challenge in the next decade. In 2022, Scope 1 and 2 emissions from Australia's integrated aluminium industry (bauxite, alumina, aluminium) were about 34 Mt CO₂-e, which was 7% of Australia's national emissions. Energy typically accounts for 30-40% of the industry's cost base, and therefore energy efficiency is a key focus of for these processes. The integrated nature of bauxite mining, alumina refining, aluminium smelting and extrusion processes in Australia means that efficient and effective regulatory processes for each step is critically important to the ongoing operation of the overall system.

In considering its views on the opportunities and trade-offs in the Australian economy at each stage of the transition to net zero, the Authority will need to consider, not only local challenges in the pace and scale of decarbonisation of sectors but also, the evolving geopolitical landscape, at both a macro and granular level.

Additionally, the Council is concerned that the modelling approach may be too high level to adequately factor in technology switching and investment in new technologies. Given the criticality of access to low-cost, firm, renewable energy, it is important that the role of new technologies is properly considered across industries and locations. In this context the Council believes that the Authority should consider how the planned approach factors in evolving technology costs over time and changing financing costs over time, and possible government options to reduce them.

What are the strengths or limitations of these models the authority should keep in mind when interpreting their outputs? Are there other models that would provide valuable insights into the questions the authority is trying to answer?

Some of the Council's Members undertake their own modelling using computable general equilibrium (CGE) models and based on this experience offer the following insights:

- A potential limitation of a CGE model of this kind is whether it has an accurate enough representation of all the technology switching options, particularly for hard-to-abate industry and some smaller sectors, and their associated marginal abatement costs are sensitive to many factors. Marginal abatement costs tend to be highly heterogeneous for different sites. A single number used country-wide can easily under/over-estimate switching given a single country-wide shadow carbon price.
- Depending on how shadow carbon prices are modelled, the time-horizon (or social discount rate) can be very impactful.
- Learning curves for emerging technologies tend to be steep, and sometimes a technology requires high effective carbon prices for a relatively short period before costs become more reasonable. While carbon prices are typically modelled as rising over time, the reality for subsidies such as renewables and electric vehicles is that they have fallen quickly. In practice it can be highly beneficial (i.e. lower economic cost) to apply different policies to different sectors, and to adapt their structure over time.

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

³ International Aluminium Institute High Substitution Scenario

⁴ <https://aluminium.org.au/wp-content/uploads/2023/08/230817-Aluminium-Critical-Minerals-List-Update.pdf>

⁵ 2023 Half Year Results - <https://www.riotinto.com/en/invest/financial-news-performance/results>

- Modelling in a CGE framework, or in any policy-agnostic way, will typically miss quite a few important details. Although this may still add up to total emissions behaving reasonably, it would be worthwhile to think carefully about how targets are imposed on certain key technologies, such as renewables targets, transport fuel-switching etc.

Do you think the proposed global action pathways provide an appropriate context for assessing potential Australian emissions pathways? Are there alternatives you think are higher priority pathways to consider? Are the IPCC, IEA and GLOBIOM assumptions appropriate for the proposed scenarios?

Globally, the aluminium industry has used International Energy Agency Net (IEA) scenarios for its sectoral pathways⁶, its model⁷ to drive emissions reduction and the 1.5 degree aligned transition strategy⁸. In this context the Council believes these global pathways provide appropriate context for assessing Australian emissions pathways.

What potential Australian emissions pathways or scenarios do you think would provide the most valuable modelling insights and inputs to support the authority's advice?

As the Authority considers what ambition is appropriate for Australia, the Council also encourages consideration of how this will be both interpreted and met. For example, Australia's current ambition of a 43% reduction by 2030 while being a national target has been directly applied to the Safeguard sector. Not all sectors have equal opportunities to abate at equal rates. The Council notes that the Authority is considering this in parallel with the Government's development of Sectoral Decarbonisation plans⁹. While the development of these plans is likely to help inform the pace of available abatement in each sector, as well as policy levers required to support this, these plans are unlikely to be completed before the Authority completes its modelling. The success of Australia's transition will not be measured in a single year but in the ability of the economy to maintain industry, jobs and competitiveness while also decarbonising, through the period to 2030 and beyond, to achieve net zero by 2050.

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 Council recognises that the Authority has an important ongoing role in the evolution of Australia's climate framework and looks forward to continuing constructive dialogue with during its development. The Council is happy to provide further information on any of the issues raised in this submission.

Kind regards,



Marghanita Johnson
Chief Executive Officer
Australian Aluminium Council
M +61 (0)466 224 636
marghanita.johnson@aluminium.org.au

⁶ <https://international-aluminium.org/resource/aluminium-sector-greenhouse-gas-pathways-to-2050-2021/>

⁷ <https://international-aluminium.org/resource/1-5-degrees-scenario-a-model-to-drive-emissions-reduction/> and <https://international-aluminium.org/resource/beyond-2-degrees-the-outlook-for-the-aluminium-sector-factsheet/>

⁸ <https://missionpossiblepartnership.org/wp-content/uploads/2023/04/Making-1.5-Aligned-Aluminium-possible.pdf>

⁹ <https://minister.dcceew.gov.au/bowen/speeches/address-clean-energy-council>