



Wide Bay Burnett Environment Council
PO Box 97, Maryborough, Queensland, 4650
2 September 2022

Senate Rural & Regional Affairs & Transport Committee Inquiry: Iron Boomerang

Dear Committee Secretariat,

On behalf of the Wide Bay Burnett Environment Council Inc (WBBEC), thank you for the opportunity to make a submission to the Inquiry into the project known as the "Iron Boomerang".

WBBEC is an apolitical not-for-profit member-based environmental advocacy organisation in the Wide Bay Burnett region of Queensland. Further information about WBBEC and its activities can be found at <https://wbbec.wordpress.com/>.

Our submission is as follows.

Summary

1. Carbon from metallurgical coal is not necessary for steel-making, provided an alternative reductant such as hydrogen from electrolysis of water is used.
2. The Iron Boomerang project is based on the continuing use of metallurgical coal and associated carbon dioxide (CO₂) emissions.
3. If Australia is to avoid breaching the Paris Climate Accords, Australia needs to end carbon dioxide (CO₂) emissions by 2050. Continuing operation of the Iron Boomerang project past 2050 is inconsistent with Australia's commitments under the Paris Climate Accords.
4. Since Australia's steel-making and -using trading partners must also meet their Paris Climate Accord commitments, it is unlikely they will continue operating coke-consuming blast furnaces; this means that Queensland's metallurgical coal production will inevitably decline and cease.
5. Given that the Iron Boomerang project must cease operation within three decades of this Inquiry, WBBEC consider the trans-continental Iron Boomerang to be a poor use of investment funds.
6. WBBEC proposes that instead of the Iron Boomerang, consideration should be



given to developing a hydrogen production industry in the Pilbara in order to supply hydrogen to Pilbara steel-making smelters.

Recommendations

WBEC recommends that taxpayer funds not be invested in the Iron Boomerang.

Submission in Detail

Iron ore consists of iron oxide (hematite and magnetite). Steel-making requires the reduction of those iron oxides to iron metal. Steel-making in blast furnaces involves the heating of a mixture of iron ore with coke (carbon, produced from metallurgical coal), to produce iron metal and carbon dioxide (CO₂). Essentially, the oxygen is removed from the iron oxide by reaction with carbon.

Every tonne of steel produced in a blast furnace requires approximately 1.6 tonnes of iron ore¹ and 770 kg of metallurgical coal², and entails emission of approximately 1.83 tonnes of carbon dioxide (CO₂)³.

In 2020-2021, Australian iron ore export volumes are estimated at 871 million tonnes⁴. Steel production from this much iron ore is approximately 544 million tonnes, and it required 419 million tonnes of metallurgical coal with CO₂ emissions from blast furnaces of 996 million tonnes of CO₂.

If the steel was produced in Australia and then exported then the shipping from Australia of 1,290 million tonnes of raw material would be replaced with the export of 544 million tonnes of (value-added) steel.

East West Line Park's Iron Boomerang project is described by the proponent at its website⁵ as consisting of blast furnaces in Western Australia's Pilbara region and Queensland's Bowen Basin connected by an approximate 3,000 kilometre-long railway line traversing inland northern Australia. Up to 435 million tonnes of iron ore (50% of what is presently transported from Pilbara mines to coastal ports) could be transported eastwards from Pilbara to Queensland blast furnaces smelters, and the trains backloaded with approximately 210 million tonnes of metallurgical coal.

¹ <https://www.bhp.com/what-we-do/products/iron-ore> downloaded on 19 October 2022

² <https://www.bhp.com/what-we-do/products/metallurgical-coal> downloaded on 19 October 2022

³ "Reduction of Greenhouse Gas Emissions in Steel Production", https://www.regional.nsw.gov.au/_data/assets/pdf_file/0008/1317779/Final-Report-Reduction-of-GHG-Emissions-in-Steel-industries.pdf downloaded on 19 October 2022

⁴ <https://publications.industry.gov.au/publications/resourcesandenergyquarterlyjune2021/documents/Resources-and-Energy-Quarterly-June-2021-Iron-Ore.pdf>, downloaded 19 October 2022

⁵ Iron Boomerang Project Overview <https://www.ewlp.com.au/overview>, accessed on 19 October 2022.



272 million tonnes of steel would be exported to steel users from each of Queensland and Pilbara ports.

The Iron Boomerang conceptual design is therefore an elegant solution to the issue of bringing iron ore and metallurgical coal to the blast furnace to make steel, achieving substantial value-adding of Australia's exports, creating jobs, economic and taxation revenue in Australia.

However, carbon is not the only reductant that can be used to remove the oxygen from iron ore. The major alternative reductant is hydrogen (H_2) that can be produced by, for example, electrolysis of water; reacting the 1.6 tonnes of iron ore with approximately 50 kg of hydrogen can produce a tonne of steel⁶.

Instead of exporting 871 million tonnes per annum of iron ore from the Pilbara, if 27.2 million tonnes per annum of hydrogen (H_2) could be supplied to Pilbara furnaces then the 544 million tonnes per annum of steel could be made in and exported from Western Australia, with no need to construct a trans-continental railway, and CO_2 emissions of 996 million tonnes would be avoided.

This would contribute to the efforts of both Australia and its steel-using trading partners North Asia to meet the commitments to which they are bound under the Paris Climate Accords⁷, agreed in Paris in 2015.

If Australia is to avoid breaching the Paris Climate Accords, the Iron Boomerang project will need to cease operation by 2050.

This submission addresses each Term of Reference as follows.

a) the employment likely to result from the project during construction and once completed;

WBBEC accepts that if its recommendation is followed then there will be no employment during construction and operation of a trans-continental railway ("Iron boomerang") or blast furnaces in Queensland.

Instead, there will be employment during construction and operation of hydrogen production facilities and hydrogen-based iron smelters in the Pilbara.

b) the effect on Australia's gross domestic product and balance of payments from this significant change in Australia's productive capacity;

⁶ "The potential of hydrogen for decarbonising steel production", [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/641552/EPRS_BRI\(2020\)641552_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/641552/EPRS_BRI(2020)641552_EN.pdf) downloaded on 19 October 2022.

⁷ The Paris Agreement, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>, downloaded on 19 October 2022.



Australia will be exporting (value-added) steel instead of iron ore. Note that Australia's metallurgical coal export industry will inevitably cease operation as a consequence of Australia's trading partners meeting their commitments under the Paris Climate Accords.

c) capital, energy and resources required to build and operate the proposed 10 steel plants, 5 at Port Hedland, Western Australia and 5 in the Bowen Basin, Queensland;

If there are to be 10 steel plants, they will all be located at Port Hedland, Western Australia; there is no need for any plant in Queensland.

d) the feasibility of the proposed clamshell design and electric/diesel propulsion to safely transport iron ore and coal across the 3000 kilometre route;

WBSEC has no comment regarding this issue at this time.

e) the environmental benefit of the reduction in bulk ore exports in regard to marine pollution and energy consumption;

WBSEC's alternative proposal will result in the same 58% decrease in exported tonnage (544 million tonnes of steel being exported each year instead of 1,290 million tonnes of iron ore and metallurgical coal) as would the Iron Boomerang.

f) any environmental impacts from the proposed alignment;

There will be no environmental impacts if there is no railway constructed.

g) any impacts of the rail line or steel parks on the Aboriginal community;

There will be impacts on Aboriginal communities if there is no railway constructed. Under WBSEC's alternative proposal, there may be employment benefits for Aboriginal communities in the Pilbara.

h) the relevance of the Iron Boomerang project to our national security; and

Since the Iron Boomerang would be a poor use of investment funds, WBSEC recommends that Australia develop its national security by enhancing its economic development through projects that are consistent with Australia's commitments under the Paris Climate Accords.

i) any other related matters.



Much as Australia cannot have a healthy economy without a healthy environment⁸, the same holds for our steel-using trading partners. This means coal-burning blast furnaces must be replaced worldwide, so that Queensland's exports of metallurgical coal will inevitably cease. Instead of investing in a trans-continental railway that must cease transporting coal by 2050, there is therefore an opportunity to invest in developing a value-adding steel-making industry in the Pilbara using hydrogen smelters.

Thank you for considering our submission.

Yours sincerely

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⁸ "A wounded environment leads to an unliveable economy", Ross Gittins, Sydney Morning Herald, 3 August 2022, <https://www.smh.com.au/business/the-economy/a-wounded-environment-leads-to-an-unliveable-economy-20220802-p5b6jn.html>