Response to Expert Panel's Minute 4—Green Steel [FTAA-2506-1074]

4 December 2025

Thank you for the opportunity to respond to the Expert Panel's (Panel) Minute 4 and the questions and clarifications directed to Castalia/Andreas Heuser.

Paragraph 4: Emissions benefit

The original Castalia report calculates emissions benefits including both avoided New Zealand emissions, avoided emissions from shipping (scrap out of New Zealand and finished steel into New Zealand), and reduction of emissions from overseas production of finished steel (BF/BOF method) compared to domestic production using EAF.

Since completing that report, the Panel has interrogated several other possible scenarios. We think the correct factual (project proceeds) and counterfactual (project does not proceed) is as set out in the original Castalia report, for the reasons set out therein.

Emissions (globally) are materially lower in the factual:

- Imported steel from BF/BOF production is reduced
- Domestic production from EAF has a much lower emissions intensity compared to BF/BOF in overseas locations
- Even if domestic production displaces overseas EAF (which we do not agree is the correct comparison—see response below), New Zealand EAF production has a 5-7x lower emissions profile than overseas EAF production because overseas EAF plants where NZ scrap steel is exported to rely largely on electricity generated by fossil fuels and not renewable sources.

Paragraph 5: Relevant counterfactual—whether recycling scrap steel in New Zealand will displace overseas recycling

The relevant substitution for the assessment of economic and other benefits to New Zealand (section 43 FTAA) is:

- What would happen in New Zealand if the project does not proceed (counterfactual); and
- What would happen in New Zealand if the project proceeds (factual).

We compared the production method of the steel imported to New Zealand (counterfactual) vs steel produced by National Green Steel's plant (factual). The steel made at the proposed plant will replace imported structural steel currently sourced overwhelmingly from BF/BOF mills (China, India). The only relevant substitution is that domestic production displaces

imports, not global EAF volumes. Both the FTAA and the Treasury's Guide on Social Cost Benefit Analysis confirm that this is the relevant comparison.

No noticeable substitution effect overseas

Even if the Panel decides to remain focussed on overseas substitution in the factual, there would not be any noticeable substitution overseas.

The global displacement of scrap recycling is so small that it could not possibly reduce offshore steel recycling. New Zealand's **total** scrap steel exports are 0.6 million tonnes per year. The global scrap market is ~700 million tonnes. New Zealand's share is < 0.1 percent which is far too small to affect global recycling rates. The elasticity of global steel scrap demand is effectively zero at that margin. No overseas recycling-mill will alter its operations because New Zealand sells or withholds less scrap steel. Those mills draw from enormous global and domestic pools of commodity ferrous scrap metal.

Even if the proposed plant substitutes for overseas recycling, it would lower emissions

Furthermore, even if the Panel pursues its current view (despite the clear evidence and economic rationale showing there would be no substitution for overseas recycling), overseas Chinese, Indian, Indonesian and Malaysian EAF plants rely on electricity generated in large part from burning fossil fuels. Therefore, global emissions would be significantly higher in the Panel's current view of the counterfactual because those overseas plants would use electricity produced from burning a lot of fossil fuel. This is true regardless of whether the plant uses 100 percent renewable energy or simply uses New Zealand grid power (which was 85percent renewable in 2024, higher in the years prior, and trending up).[1]

To further cement this point, the published carbon intensities (that is, how much fossil fuel is used to generate grid electricity) for China, India, Indonesia, Malaysia and New Zealand are:

- China: 557 g CO_2/kWh[2]
- India: 713 g CO_2/kWh[3]
- Indonesia: 749 g CO_2/kWh[4]
- Malaysia: 774 g CO_2/kWh[5]
- New Zealand: 101 g CO_2/kWh[6].

This shows that a kWh of New Zealand grid electricity is more than five to seven times less carbon intensive than in China, India Malaysia and Indonesia.

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1 MBIE Energy Statistics, published annually.

2 Climate Transparency, 2022 (China), https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-China-Web.pdf

3 Climate Transparency, 2022 (India), https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-India-Web.pdf

4 Climate Transparency, 2022 (Indonesia), https://www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-Indonesia-Web.pdf

5 Malaysian Government statistics, 2022 (on the peninsular where most industry is located), https://myenergystats.st.gov.my/documents/d/guest/grid-emission-factor-gef-in-malaysia

6 Average of past 5 years, from MFE, Measuring Emissions Guidance 2025, available at: https://environment.govt.nz/assets/publications/Measuring-Emissions-Guide-2025/EmissionFactors_Workbook_2025_2.xlsx

Para 6: Reliance on renewable electricity

The Panel seeks to understand how the plant's operation on a 24/7 basis will achieve reliance on 100 percent renewable electricity and in particular, how this will be managed during periods of high demand to reduce load.

I understand that James Carmichael will respond substantively on this point. However, I note that 100 percent renewable procurement is not the same thing as 24/7 physical renewable supply. It is standard commercial practice for large electricity consumers in New Zealand to contract for 100 percent renewable supply or manage operations in such a way to ensure that electricity used is 100 percent renewable. This can be achieved through long-term renewable energy power purchase agreements (PPAs) and/or purchasing renewable energy certificates. It does not require the firm to physically isolate the exact electrons used to power the plant.

Andreas Heuser

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