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Re Process Heat in New Zealand: opportunities and barriers to lowering emissions.

Thank you for the opportunity to submit on the technical paper. NZ Steel has engaged on the subject of the move to a low emissions economy as part of recent submissions to the Productivity Commission [1,2] and on the proposed Zero Carbon Bill[3].

NZ Steel operates a fully integrated steel mill at Glenbrook, South Auckland, producing a large range of steel products from local raw materials for use in the building, construction, manufacturing and agricultural industries. NZ Steel is the single largest manufacturing employment site in the country employing over 1200 people directly and a further 2,500 indirectly, we also have around 200 semi-permanent contractors. Around 650,000 tonnes of steel are manufactured each year, predominantly for the domestic market.

It is important to recognise that the NZ Steel operation at Glenbrook is unique in NZ and globally. Unique in that it is the only raw steel manufacturer in NZ, and unique globally in that it is the only steel manufacturer sourcing iron from local iron sand as opposed to internationally mined iron ore. NZ Steel is also significantly different from other domestic major process heat users in that heat is a by-product rather than an input (refer Figure 1).

We have very little demand for process heat. Iron and steel production is a thermo-chemical reaction process which generates heat that is partly recovered to improve the efficiency of the plant. Part is also used to generate steam for the process heat that is required for the downstream processes of rolling and coating.

NZ Steel does not directly generate process heat from fossil-fuel fired sources.

[1] https://www.productivity.govt.nz/sites/default/files/sub-low-emissions-64-new-zealand-steel-1580Kb.pdf
[2] https://www.productivity.govt.nz/sites/default/files/sub-low-emissions-309-new-zealand-steel.pdf
[3] https://www.mfe.govt.nz/sites/default/files/Organisations_3/12607_NZ_Steel_Redacted.pdf

Our Process: From Sand to Steel

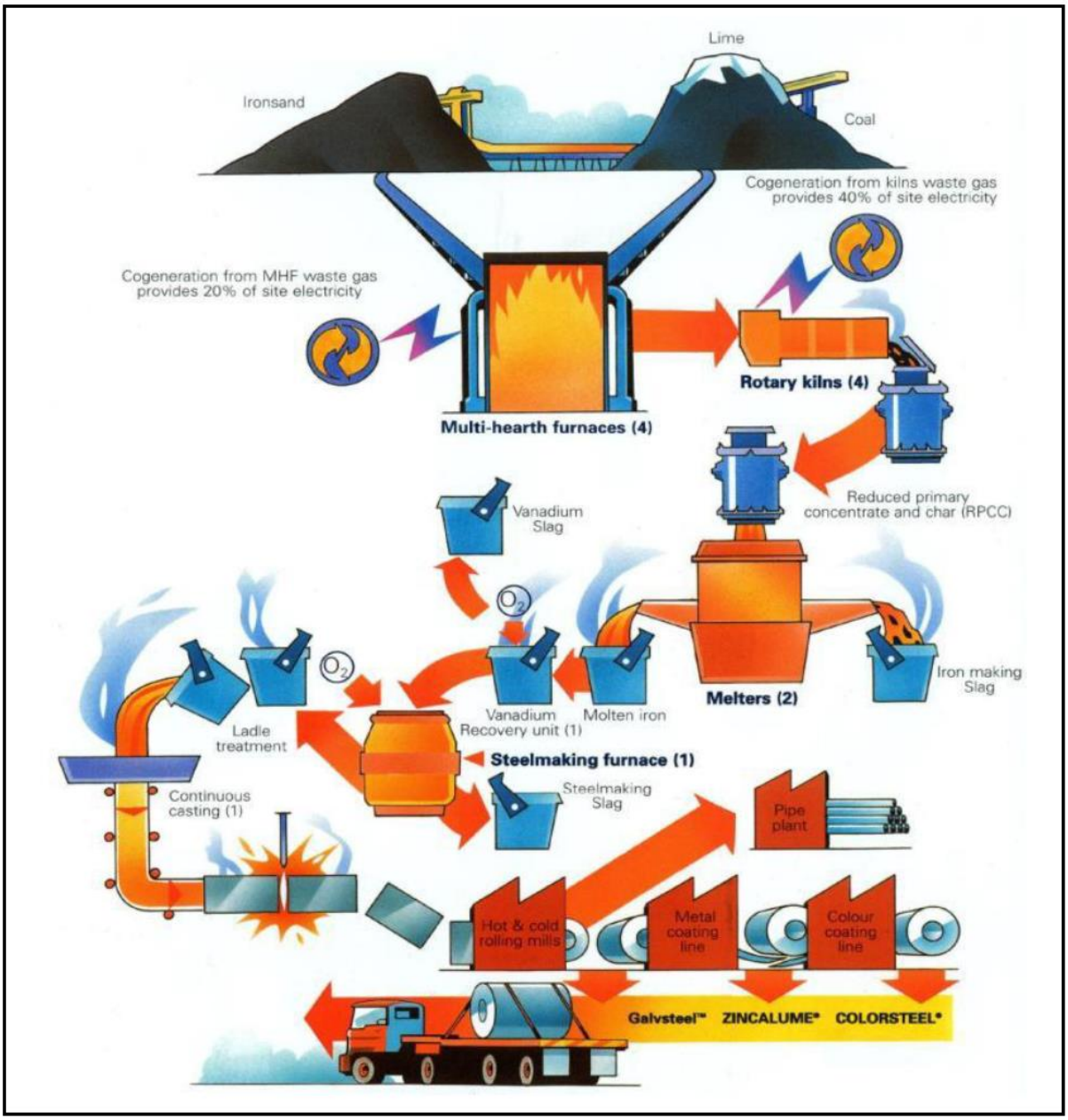

Figure 1

Specific Submission Points

Q1: To what extent has the NZ ETS influenced process heat investments in your business?

The current use of waste heat is not directly influenced by the NZ ETS. We have not needed to explore alternate sources of process heat.

***Q2:** To what extent do you agree that businesses are accounting for the price (and future price) of emissions, but face other barriers to reducing process heat related emissions?*

Strongly agree. Other considerations include fuel balance, plant specific consideration, process and safety.

***Q3:** To what extent do you agree that businesses are accounting for emissions prices but are unresponsive to changes in the emissions price?*

The current level of carbon prices is a material factor in business considerations. However, short term carbon price is less important than longer term trajectory. For our business the scope for fuel switching in response to carbon price is minimal, and constrained mainly by current commercialised technologies.

***Q4:** Does the NZ ETS provide an incentive to significantly reduce emissions beyond current levels for business who receive industrial allocation?*

- YES – every tonne of emissions saved retains the full value of the emission price as the opportunity value of being able to sell a unit instead of having to surrender it remains. At the current price of carbon circa $25/t there is significant incentive to reduce emissions.
- This issue has been discussed at length during the development of the NZ ETS and the decisions on an appropriate EITE sector allocation regime.
- It is disappointing to see this matter relitigated and being characterised as a "market failure" in para 43. The incentive to react was greatly reduced when the cost of carbon decreased to $2/t and less. This was not a failing of the ETS per se, rather factors that influenced international carbon prices (unit over supply combined with reduced demand in the main EU ETS and Kyoto markets due to the Global Financial Crisis).

***Q5:** To what extent does your business ring-fence capital for energy related projects?*

We don't per se, however there is a greater focus on evaluating potential projects, including energy, that contribute to the UN Sustainable Development Goals[4]

***Q6:** To what extent are objectives such as sustainability incorporated into your organisations investments, i.e. is sustainability included in your KPIs?*

NZ Steel is part of The Bluescope Group. Sustainability is a key focus throughout the Group. There are five sustainability topics considered most material to our business – safety, health and wellness; climate change and energy; diversity and inclusion; governance and business conduct and supply chain sustainability. These topics form the foundation for BlueScope's sustainability reporting[5] which aligns with the Global Reporting Initiative (GRI) standards[6].

***Q7:** Are these objectives considered secondary to risk and return?*

Operating in a sustainably responsible manner is critical to our 'license to operate' with all stakeholder groups; customers, investors, community.

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[4] https://www.un.org/sustainabledevelopment/sustainable-development-goals/
[5] https://www.bluescope.com/media/2480/fy2018-bluescope-sustainability-report.pdf
[6] https://www.globalreporting.org/standards/

Q8: *Do you agree that energy efficiency or renewable projects are often not implemented as they are not core business investments?*

Energy is one of the major inputs to our business and efficiency in operation is key to managing costs.

Q9: *Is your business limited by access to capital for energy related investments? Is this due to lender appetite or are these limits self-imposed?*

Energy projects within the business are evaluated as for all potential capital projects, and the limitations that exist on capital investment within an international business.

Q10: *To what extent do hidden costs or co-benefits (as described above) hinder or progress process heat investments?*

Steel making is a 24/7 operation where the requirement is to carry out maintenance / projects in a planned shutdown period. This determines the window of opportunity. For this reason, projects must be carefully scoped and planned.

Q11: *Does your organisation actively monitor its energy use and/or its emissions?*

- Energy use is monitored, recorded, and information available real-time at process level and for major site services.
- Comprehensive energy reporting is produced monthly and available on our Company intranet for all system users.

Q12: *Do you think that there would be benefits from publishing individual emissions data reported by NZ ETS participants and/or large process heat users?*

- No.
- In some cases this information is commercially sensitive and would provide information to suppliers and international competitors.
- Given the uniqueness of our site and industrial processes, some data provided would be of little use without a full understanding as to context.

Q13: *Do any of the informational barriers described above have an impact on your organisation's decision to invest in process heat technologies, and if so, to what extent?*

While we have good real-time energy information systems across the business, we do not always monitor to a discrete level (eg motors).

Q14: *Could you please rank the three informational barriers as listed directly above this box in order of impact on your organisation?*

As sole steel maker, NZS cannot take the risk of employing non-proven technology which may lead to disruption to product supply/ quality, except in ancillary services (para 66)

Q15: *Has your organisation considered electrifying part or all of a given site's heating process?*

Yes. As discussed with the ICCC there are: technical barriers (eg very large additional regional electrical demand – Barrier J), negative impact on product quality (eg paint surface finish), and capital cost (eg replacing natural gas with electrical transformers - Barrier I).

Q16: *If so, to what extent do you agree with the barriers I to K listed above?*

Agree, and refer Q15.

Q17: *What does your organisation consider are the largest barriers to the electrification of its production?*

Refer Q15.

Q18: *Are there any costs or co-benefits of electrification that we have not included that your organisation has identified?*

- The grid supplied electricity pricing mechanism builds in a carbon price even when the generation is largely renewable (when fossil fuel is on the margin) as evidenced by the need to develop the electricity allocation factor for EITE allocation[7]
- This negates New Zealand's "low cost renewable" advantage when evaluating increasing electricity use.
- Consideration of the impact on electricity prices on moving towards 100% renewables also warrants caution.
- We suggest the report of the ICCC which is due to be released in April will contribute strongly to this wider discussion.

Q19: *Has your organisation considered biomass as a fuel source? If so, what did you conclude and why?*

- Only cursorily. Our site is remote from the potential fuel source and there are limited applications apart from electricity generation.
- NZ Steel continues interest and support of 'green' coke trials as a substitute source of carbon in the iron making process.

Q20: *To what extent do you agree with the barriers L to M listed above?*

n/a

Q21: *What does your organisation consider to be the largest barrier(s) to the use of biomass for supplying heat?*

Refer Q19

[7] http://www.mfe.govt.nz/consultation/consultation-setting-electricity-allocation-factor

Q22: *Has your organisation identified any costs or co-benefits of using biomass that we have not included above?*

n/a

Q23: *Has your organisation considered building onsite generation? If so, why did the project go ahead or not go ahead?*

- Our Glenbrook site has one of the largest cogeneration plants in the country. It is primarily fuelled from off gasses and waste heat from the iron making process.
- Additional output potential has been identified and additional MWs continue to come on stream.
- Wind was investigated some years ago, but was not deemed economically viable at that time. We are revisiting this.

Q24: *Are there any barriers to, or co-benefits from, the use of onsite generation that we have not included that your organisation has encountered?*

There is true avoidance of carbon cost if onsite renewable generation is used.

Q25: *Does your organisation have the potential to use direct heat from geothermal?*

No

Q26: *If so, what are the key barriers that hinder your organisation from using direct heat from geothermal?*

N/A

Q27: *Has your organisation identified any other barriers to, or co-benefits from, the direct use of geothermal heat that we have not included above?*

N/A

We will be pleased to provide any further information that will assist, and commend to you the submission made by the Major Gas Users Group which takes a wider perspective on the subject.

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