

## Process Heat in New Zealand: Barriers to lowering emissions

Submission on behalf of Taranaki Energy Watch

It is noted that most of the identified barriers are not physical or even economic. The issues appear to be motivational and organisational.

Addressing the first issue requires a 'carrot and stick' approach whereby emitters face the full cost of their discharges. Leakage, in terms of the effect on global CO<sub>2</sub>, is not the problem it is commonly made out to be for most major emitters (see below). Incentivising changes, either investment in energy efficiency or fuel switching, should consist of low or interest-free loans made available from a fund built from the auctioning of NZUs *and* an educational programme aimed at executives and engineers.

The most obvious example where the second issue could be addressed is the use of biomass. Every year hundreds of thousands of tonnes of post-harvest forest residue is left to rot, and possibly pose a hazard during a heavy rain event. It would be a simple matter to stack the residue on skid sites and tracks, allowing a period of time for drying out before being chipped. It is noted that districts where there are large areas of plantation forest tend to have easy access to rail. In theory biomass could completely replace all coal and gas for industrial heating purposes, especially if processes were made more efficient. If we include heating in domestic, commercial and institutional circumstances, the total required would be equivalent to approximately 30% of NZ's current plantation forest area on a permanent basis (Otago University Energy research Centre).

Many companies suffer from an additional problem of a corporate culture which employs a PR division to say all the right things while the executive gets on with business as usual.

Example: Fonterra

Fonterra is NZ's largest corporate emitter of CO<sub>2</sub> (2.1Mt). Its use of coal has attracted some public attention but we note that its plant at Whareroa (Hawera) uses untreated Kapuni gas. This results in production from Whareroa having as large a carbon footprint as product from its coal fired plants. Fonterra could immediately reduce its total emissions by some 250,000 tonnes (ie 12%) if it switched to low CO<sub>2</sub> gas but the company has ignored the potential due to lack of a pricing signal. In 2004 Fonterra applied for resource consent to fire the Whareroa plant with coal. Publicly it stated it had concerns over gas supply but it emerged that in reality this was a gambit in price negotiations with the Todd Corporation through which it purchases Kapuni gas and operates its cogeneration plant. Fonterra has lobbied extensively against regulation on CO<sub>2</sub>. A more responsible path for Fonterra would include the following:

- a move away from a reliance on milk powder sales (powder drying consumes the majority of heat energy required at processing plants) which also makes economic sense in terms of diversification into value-added product

- the replacement of coal with biomass. So far the company's move in this direction has been token and it has largely ignored the potential due to lack of a pricing signal
- as Synlait has recently announced, installation of electrical dryers where practical. It is noted the Whareroa plant is sited on one of the windier places in the North Island.

### **Leakage**

Five major industries may be 'trade exposed' to full cost of emissions. There needs to be independent evaluation of the benefit or otherwise of these companies activities to the NZ economy. Threats to leave are a commonplace PR strategy of some of these companies whenever circumstances could affect profits.

- Methanol production. NZ's second largest point source emitter of CO<sub>2</sub> (1.8Mt) and its single largest consumer of gas is Methanex, which takes some 40% of NZ's total gas production. Its sources are largely the Pohokura and Mangahewa fields, the latter requiring extensive 'fracking' in order to keep gas flowing. Methanex is a net drag on the NZ economy, having paid no corporate tax for an extended period of time. Statements that should Methanex shut down, methanol production would be ramped up in China thus increasing emissions can be regarded with a considerable degree of scepticism. The Taranaki plant is Methanex's largest and it has stated it would simply ship the whole installation overseas and set up somewhere else with cheap gas (and presumably a lax tax regime). According to its 2016 annual report to Canadian shareholders, the company appears to have accumulated a large number of foreign carbon credits during the time of supply from the Ukraine and other questionable sources, which it has exchanged for NZUs. The plant's closure can only be of benefit to NZ and global emissions would not increase.
- Dairy products. There is a school of thought which proposes that any decline in the growth of dairy exports from New Zealand would be accompanied by increased production from less carbon-efficient countries. This presumes these countries would increase production in response to rising export receipts. However, obtaining reliable data supporting this contention is difficult due to the complexities of the various factors involved. For example, volumes exported from many countries can be dependent on internal politics surrounding such issues as quotas, subsidies and trade restrictions rather than international prices for dairy products. Reducing the carbon footprint of dairy processing would only have a minor effect on the price of final product.
- Aluminium production. The Rio Tinto plant at Bluff is a net drag on the NZ economy. Like Methanex, the company also avoids its tax responsibilities. Its profitability is highly dependent on the price it pays for its electricity, largely supplied by the Manapouri hydro station, approximately 15% of NZ's total generation. Should the plant close, production may (or may not) be replaced by foreign plants with a higher carbon footprint; however, in any case, any extra emissions should be easily offset by electricity available from Manapouri being used to reduce carbon emissions from NZ.
- Steel production. NZ Steel's Glenbrook plant is NZ's largest point source emitter of CO<sub>2</sub> (2Mt). We are unaware of any financial analysis assessing whether or not the company (100% foreign owned) is of net benefit to the NZ economy. The carbon footprint of steel manufacture is similar around the world, thus should the plant

close, there would be no potential net increase in global emissions. It is unlikely the plant would close, even if the company was exposed to the full cost of its emissions. There is a considerable global research effort into developing “carbonless” steel manufacture but scale up to industrial levels is still some years away.

We note that steel can be recycled indefinitely. Much of NZ Steel’s product is exported. Reducing domestic demand for new steel by encouraging recycling within NZ would also reduce the rationale for the plant’s existence.

- Cement. As with steel, moving cement manufacture off-shore will not increase global emissions apart from the small amount associated with transport. However there may be a case for handling cement emissions differently as concrete absorbs atmospheric CO2 over time.

**Special case:** the Kapuni field

Gas from this field consists of 45% CO2 at the wellhead. Currently, in order to produce pipeline quality gas, the CO2 is extracted utilising a chemical process and is vented in a concentrated form to the atmosphere. Some industries buy untreated gas either because it’s cheaper (eg Fonterra) or CO2 is required for chemical processes. CO2 currently being vented could be collected and stored permanently underground. The technology is well proven and in Kapuni’s case would be relatively inexpensive but the company has ignored the potential due to lack of a pricing signal. However, an appropriate storage site, if onshore, does need to be carefully considered in terms of the effects of possible leakage. This is a special case of Carbon Capture and Storage (CCS) and is quite different from systems extracting CO2 from the flue of a power station or factory.

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