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Submission on the Draft Climate Change (Stationary Energy and Industrial Processes) Regulations 2009

1. Introduction

- 1.1 This submission is made by Carter Holt Harvey Limited (**CHH**), Australasia's largest wood products processor and one of New Zealand's major energy users.
- 1.2 CHH's pulp and paper operations combust biomass for energy use, utilising wood residues and pulping (black) liquor. The Kinleith mill derives approximately 78% of its energy from biomass combustion, while the Tasman mill derives approximately 72% of its energy from biomass combustion. CHH's wood products operations also combust biomass for energy use, utilising wood residues.
- 1.3 The Kinleith and Tasman pulpmills also contain kraft mill lime kilns which are embedded in the chemical recovery and regeneration processes necessary for kraft pulping. Burnt lime is both produced and purchased for use in the pulping process. The use of lime in pulp and paper production is carbon neutral.

2. Combustion of biomass

- 2.1 The Emissions Trading Bulletin No 10, June 2009 which provides a commentary for the draft regulations, states that "*CO₂ emissions from combusting biomass are not counted in these regulations as they are effectively covered under the forestry regulations.*" However, under the regulations as currently drafted users

of biomass combusted for energy would still have to account for the N₂O and CH₄ generated in the combustion process, on a CO₂ equivalent basis.

- 2.2 Schedule 2, Table 6, Part C of the draft regulations provides that “*solid biofuels – wood and wood waste*” carry a default emissions factor of 1.87 tCO₂e/TJ (excluding CO₂). Alternatively, the draft Climate Change (Unique Emissions Factors) Regulations 2009 allow for waste combustion users to apply to use a unique emissions factor (UEF), which would require the use of continuous monitoring equipment positioned within the stacks to measure concentrations of greenhouse gases. The UEF threshold, contained in Table 3 of the Schedule to the regulations is 0.83 tCO₂e/TJ (excluding CO₂).
- 2.3 CHH’s position is that the combustion of wood and wood waste should not incur any emissions liability, for the following reasons:
- 2.3.1 Combustion of wood waste is an environmentally superior alternative to fossil fuel use. The motivation behind the draft regulations, and New Zealand’s climate change legislation as a whole, is to incentivise a shift away from greenhouse gas intensive activities. MfE’s Emissions Trading Bulletin No 10 states a need to ensure that there is no disincentive for the efficient use of wood waste as an alternative to fossil fuels. We would argue that any imposition of emissions liability on the combustion of biomass would act as a significant disincentive to anyone contemplating using biomass for energy.
- 2.3.2 The estimated contribution of biomass combustion to total greenhouse gas emissions for energy in New Zealand in 2007 was 0.3%.¹ In 2007, the energy sector made up 43% of New Zealand’s total greenhouse gas emissions², so the estimated contribution of biomass combustion constituted around 0.13% of total emissions across all sectors. It seems absurd to require complex and expensive measurement and recording of combustion products for the purposes of calculating true emissions liability, when the emissions represent such an insignificant proportion of the total.
- 2.3.3 The regulations require biomass combustion users to measure the calorific value (the gross energy content of the fuel in megajoules per kilogram) of the biomass combusted in the year. CHH does not at present measure the calorific value on a regular basis, due to the cost

¹ “Energy CO₂ Equivalent Emissions by Fuel Type (kt CO₂ equivalent)”, Table 2.1a “*New Zealand Energy Greenhouse Gas Emissions 1990-2007*”, Ministry of Economic Development.

² “New Zealand’s Sectoral Emissions of Greenhouse Gases in 1990 and 2007”, Table 2.3.1 and Figure 2.3.1 “*New Zealand’s Greenhouse Gas Inventory 1990-2007*”, Ministry for the Environment.

and practical difficulties in doing so. The requirement to do so would place a significant administrative and financial burden on operations.

- 2.3.4 The default emissions factor used to calculate the CO₂ equivalent value of N₂O and CH₄ arising from combustion of biomass is, in reality, known to vary widely, depending on the combustion process and the equipment used. For example, the default CH₄ emissions factor for biomass combusted in industrial wood stoker boilers is 14.25 tCH₄/PJ, while the corresponding figure for residential fireplaces is 285 tCH₄/PJ.³ Added together with the emission factor for N₂O (3.80 tN₂O/PJ for both⁴) the default emission factor for an industrial boiler in terms of equivalent CO₂ is calculated as $(14.25*21 + 3.80*310)/1000 = 1.48$ tCO₂e/TJ, (which we note to be significantly lower than the default emission factor of 1.87 tCO₂e/TJ in the regulations); for a residential fireplace the emission factor is 7.16 tCO₂e/TJ. We would submit that there is considerable doubt as to the robustness of the default emissions factor and believe there has been an error in its calculation.
- 2.3.5 In order for CHH to apply for a UEF, we would require continuous monitoring equipment to measure N₂O and CH₄. Our spot check compliance emission monitoring contractors do not have equipment to measure N₂O in the boiler stacks. If we were able to locate suitable continuous monitoring equipment, our experience indicates that the cost of installation would be upwards of \$300,000 per instrument, and we would require five instruments in order to accommodate all of the biomass combusting boilers. The calibration and ongoing maintenance costs of this type of instrument are in our experience considerable, in the order of 7-10% of capital cost per annum. This is an enormous cost to incur for the sake of using a realistic UEF, rather than the potentially substantially erroneous default emissions factor. If the cost is prohibitive for a major corporate entity like CHH, then it will undoubtedly be unaffordable for smaller entities.
- 2.3.6 We are not aware of any other country imposing a liability on the combustion of biomass. The proposed Australian Carbon Pollution Reduction Scheme obligations will not apply to emissions from combustion of biomass for energy; they will receive a "zero rating".⁵ Given that Prime Minister John Key has said as recently as May 2009 that his Government will work to ensure that its climate change policies

³ "CH₄ Emission Factors for Energy", Table 4.6 "New Zealand Energy Greenhouse Gas Emissions 1990-2007", Ministry of Economic Development.

⁴ "N₂O Emission Factors for Energy", Table 4.7 "New Zealand Energy Greenhouse Gas Emissions 1990-2007", Ministry of Economic Development.

⁵ Carbon Pollution Reduction Scheme White Paper, Policy Position 6.14.

are “as closely aligned with Australia as practically possible”,⁶ it is appropriate that the draft regulations for New Zealand also exempt combustion of biomass from emissions liability. In any case, the reasons for the exemption in Australia have at least equal application in New Zealand.

- 2.3.7 We are aware that Canadian kraft pulpmills presently receive a substantial subsidy of C\$0.16/litre for burning black liquor. This subsidy is to be applied to energy saving projects. A similar scheme also applies in the US. A subsidy such as this applied in New Zealand to our Kinleith and Tasman mills would amount to approximately NZ\$800,000 per day.
- 2.4 We recommend that the combustion of wood for energy be excluded from the definition of combustion of waste for the purposes of the regulations, or alternatively that the combustion of wood and wood waste be assigned a default emissions factor of zero.
- 3. Production and purchase of burnt lime in the Kraft pulping process**
- 3.1 Draft regulation 32 provides that the production of burnt lime, which results in calcination of limestone or calcium carbonates, incurs an emissions liability.
- 3.2 The production and purchase of burnt lime for use in the kraft pulping process should not be subject to emissions liability, as there is no net CO₂ emission from the calcination of lime in the overall kraft pulping process.
- 3.3 In the kraft pulping process, the CO₂ produced from the combustion of black liquor (the spent cooking liquor yielded from the pulping process) to form sodium carbonate. Calcium hydroxide is added to the dissolved sodium carbonate to regenerate the sodium hydroxide required for pulping together with calcium carbonate, which is separated then calcined in a lime kiln to produce calcium oxide (“burnt lime”). The burnt lime is in turn slaked with water to form calcium hydroxide to complete the lime cycle. Thus the carbon in the CO₂ released from the burning of calcium carbonate in the lime kiln originated in the wood chips used for pulp and is therefore biomass carbon, and should not be included in greenhouse gas emissions liability
- 3.4 Furthermore, studies have shown that the amount of CH₄ found in lime kiln emissions is trivial, and that N₂O emissions are unlikely due to the very high temperatures involved in the calcinations of lime in lime kilns.⁷
- 3.5 The limited losses of calcium from the system are almost entirely in the form of calcium carbonate, the same chemical form as limestone, and are made good with purchased limestone or burnt lime, with no net carbon impact.
- 3.6 We therefore recommend that burnt lime produced or purchased for use in the kraft pulping process be specifically exempted from emissions liability in the draft regulations.

⁶ “Australia’s delay on emissions strikes chord with Beehive” New Zealand Herald (8 May 2009).

⁷ R Miner and B Upton *Methods for Estimating Greenhouse Gas Emissions from Lime Kilns at Kraft Pulp Mills* www.elsevier.com/locate/energy.

4 Waste oil

- 4.1 The draft regulations provide that while waste oil combustion incurs an emissions liability, the obligation fuel component of that waste oil does not. "Obligations fuels" are listed in the Climate Change (Liquid Fossil Fuels) Regulations 2008 and include any liquid fossil fuel that is directly combusted when used.
- 4.2 The requirement of clarifying what portion of waste oil is obligation fuel should be a matter for the supplier of the oil rather than the user. This would be in line with other fossil fuels.
- 4.3 Waste oil, as well as being used in larger scale operations such as at Kinleith where combustion equipment is relatively efficient, is also used in smaller scale operations where equipment is not so efficient and environmentally sound.
- 4.4 We recommend that regulation 21 be amended so that the supplier of waste oil must record the total number of tonnes of obligation fuel included in the waste oil, and its calorific value. We also recommend that suppliers are responsible for any further obligations under the draft regulations, which would put all users of waste oil on an equal footing.

5. Geothermal steam

- 5.1 Schedule 2, Table 5, Part A of the draft regulations imposes an emissions factor of 0.1024 tCO₂e/t steam on Kawerau I Industrial Use.
- 5.2 CHH would like to work with MfE to review this emissions factor, in order to understand how the factor was derived, particularly taking into account that Kawerau II Power Plant has an emissions factor of only 0.0275 tCO₂e/t steam.

We would welcome the opportunity to discuss our submission in greater detail, particularly the Kawerau I Industrial Use emissions factor.

Yours faithfully



Brice Landman
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