Submission by the Forest Industries Association of Tasmania

to

National Greenhouse and Energy Reporting System Department of Climate Change

on

Technical Guidelines for the Estimation of Greenhouse Emissions and Energy at Facility Level - Energy, Industrial Process and Waste Sectors in Australia - Discussion Paper December 2007

14 February 2008

Forest Industries Association of Tasmania

Contents

1. Overview

FIAT congratulates the Department of Climate Change on the production of the Technical Guidelines Discussion Paper.

FIAT is concerned that the NCA Toolbox is the only proposed methodology for tracking carbon stock changes in forest systems (Section 2.4 Other Sectors: Agriculture, Forestry and Land Use) when other methods may provide for more precise and accurate calculations for future reporting obligations. FIAT strongly urges the Department of Climate Change to encourage the use of higher-order methods of estimation of carbon sequestration and losses for project level carbon accounting.

Also, FIAT suggests that a further line should be added to Table 7 as depicted in the Table below, to accommodate facilities that burn green wood wastes as boiler fuel (some FIAT member sawmills burn green sawdust blended with dry shavings at a ratio of around 5 to 1 and thus applying a single factor for dry wood would grossly overestimate energy use and emissions).

Table: Suggested addition to *Table 7: Fuel combustion - solid fuels* - to accommodate the common usage of green wood wastes as boiler fuel (suggested addition shaded yellow).

Fuel combusted	Energy content (gross) GJ/t	Emission factor kg CO_2e/GJ			
		CO_2	CH_4	N_2O	all gasses
wood/wood-waste - non-residential uses - DRY	16.2	92.1	0.08	1.2	1.3
wood/wood-waste - non-residential uses - GREEN	9.3	92.1	0.08	1.2	1.3

2. About FIAT

The Forest Industries Association of Tasmania (FIAT) is an industry association formed in 1983 to represent the interests of processors of Tasmanian forest products. FIAT was formed out of a predecessor Association, the Tasmanian Timber Association (TTA). FIAT and TTA collectively have provided representational services to the Tasmanian timber industry for in excess of 60 years. Our members' activities are diverse and include:

- the production of veneers, hardwood and softwood timber, pulp and paper;
- woodchip production and export; and
- plantation and native forest management.

FIAT's 18 member businesses include all of the State's larger processors of forest products. They utilise a significant proportion of the crown sawlog output as well as all of the high quality decorative veneer produced in the State. FIAT Members' activities account for more than 75% of the gross value of production in the forest and wood products industry in Tasmania.

Included within the FIAT membership are the State's largest industrial forestry Companies that account for the vast bulk of plantation development and management enterprises on private land in Tasmania and the largest native forest management enterprises in the private sector in this State.

As such FIAT and its members have a significant interest in the development and implementation of an Australian Emissions Trading Scheme and welcome the opportunity to comment on the Technical Guidelines discussion paper.

FIAT's role is described in our Annual Report as follows: -

Role:

In addressing its first objective, FIAT's role is characterised by helping to create the right external environment within which industry has to operate. This has two main dimensions - the policy environment and the public image of the industry in the eyes of the community.

The policy environment centres on government legislation and regulations which determine the limits to what industry can do. The policy environment must be tackled at both the Federal and State Level.

Industry's public image rests on public opinion and the various factors which influence that opinion. This is important because public opinion has a strong bearing on the development of Government policy.

In addressing its second objective, FIAT's role is to facilitate discussion and joint action among its membership, to project the membership position in wider forums as appropriate and to encourage other bodies to participate positively in the public debate to ensure that the industry retains a public license to operate.

3. FIAT comments

Section 2.4 Other sectors: Agriculture, Forestry and Land Use

FIAT welcomes the acknowledgement of complexity of emissions from agricultural processes and the research underway for improvements in accuracy of calculations at enterprise, property and regional scale.

FIAT endorses the approach of ensuring that reporting of Land-use, Land-use change and forestry activities is consistent in preparing Australia's national greenhouse inventory.

However, whilst clearly specifying that the National Carbon Accounting Toolbox (NCAT) provides tools for tracking carbon stock changes in forests it is unclear that other methods which may in fact afford more accurate and precise estimates of specific projects will be acceptable for use under future reporting obligations.

FIAT strongly endorses the recognition by the Department of Climate Change that reporters may have access to available or readily obtainable information that would enable more precise and accurate reporting than may be available through application of the technical guidelines. The department of Climate Change is to be commended in their encouragement of reporters to use higher order methods for emissions calculations where these may be available.

It is strongly recommended that the encouragement provided by the Department of Climate Change to facility level estimation reporters to use higher order methods be extended further to project level reporting in agriculture, landuse and forestry processes. This provides opportunities for project operators to contribute more precise and accurate information for national inventory reporting. FIAT currently note that the guideline documentation does not clearly indicate that potentially higher order methods for

reporting than may be available through the use of the NCAT will be accepted by the department of climate change.

On Table 7: Fuel combustion—solid fuels: NGA default emission factors

Table 7: Fuel combustion—solid fuels: NGA default emission factors, on page 31 depicts only a single gross energy content factor for wood/wood-waste of 16.2 GJ/t.

The gross energy content of oven-dry wood is invariably around 19 gigajoules per tonne. As moisture content of wood increases, the quantity of biomass in a tonne decreases and the quantity of water increases - see Figure 1 - this results in the commonly reported observation that the calorific value of a tonne of wet wood is lower than a tonne of dry wood (it is a common misconception that a tonne of wet wood has a lower calorific value because of the extra water, when in fact the lower calorific value is almost totally a function of there being less biomass in a tonne of wet wood than there is in a tonne of dry wood).

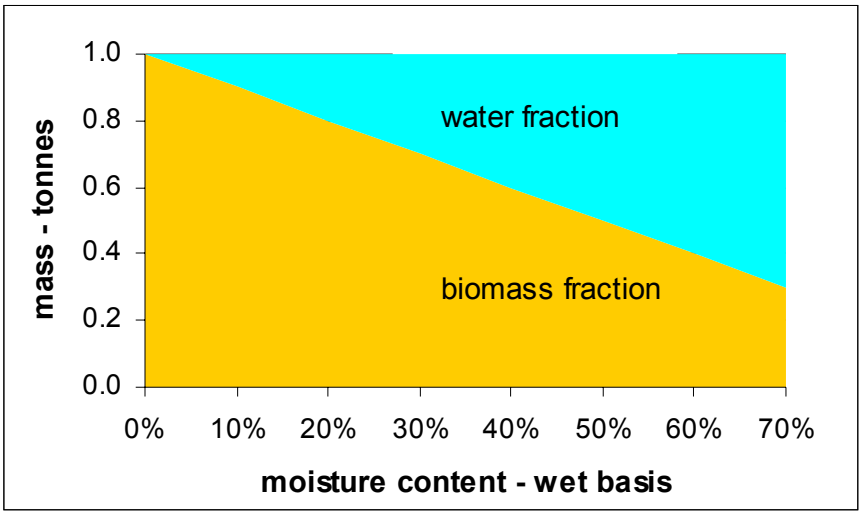

Figure 1: Biomass and water fractions of a tonne of wood versus moisture content: as the moisture content of wood increases the fraction of biomass *in a tonne* decreases and the quantity of water in a tonne increases - the depicted moisture content is "wet-basis" which is defined in Box 1. (The estimates used to generate the figure are reproduced in Appendix 1).

Wood residues are generated in wood processing works such as sawmills at two principal levels of moisture content: green (approximately 50% wet-basis[1] moisture content) and kiln-dried (approximately 12% wet-basis moisture content). As depicted in Figure 2, the gross energy content of one tonne of green wood is around half the energy content of one tonne of dry wood.

[1] see Box 1 for explanation of wet-basis moisture content

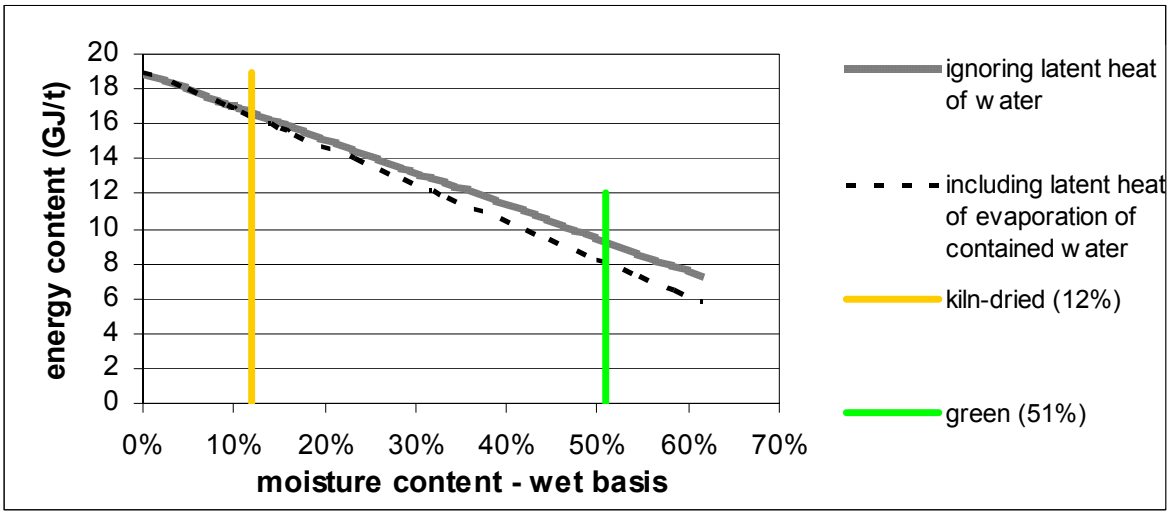

Figure 2: Energy content versus moisture content: the energy content of one tonne of green wood is around half the energy content of one tonne of dry wood - the depicted moisture content is "wet-basis" which is defined in Box 1. (The estimates used to generate the figure are reproduced in Appendix 1).

In some of FIAT's member sawmills the ratio of green wood residues to dry wood residues in the boiler-fuel-mix is around 5 to 1 - thus, to apply the factors depicted in Table 7 would grossly over-estimate both the energy consumption and the carbon-dioxide emissions of these mills.

One way to overcome this would be for reporters to work out an equivalent mass of dry wood from the mass of wet wood of known moisture content after a relationship such as (derived by FIAT):

$$Mass_{equiv-dry} = Mass_{MC\%}\left(\frac{1.176}{1+\frac{MC\%}{100}}\right)$$

where:

$Mass_{equiv\text{-}dry}$ is the equivalent mass of dry wood (at 17.6% MC); and

$Mass_{MC\%}$ is the mass of wood at the other-than-dry moisture content (at say 100% MC for green sawdust)

MC% is moisture content on the oven-dry basis.

Alternatively, and much more simply, a further line could be added to Table 7 for the burning of green wood waste, as depicted in Table 1 below.

Table 1: Suggested addition to *Table 7: Fuel combustion - solid fuels* - to accommodate the common usage of green wood wastes as boiler fuel (suggested addition shaded yellow) - (the estimate for energy content was derived as depicted in Appendix 1).

Fuel combusted	Energy content (gross) GJ/t	Emission factor kg CO_2e/GJ			
		CO_2	CH_4	N_2O	all gasses
wood/wood-waste - non-residential uses - DRY	16.2	92.1	0.08	1.2	1.3
wood/wood-waste - non-residential uses - GREEN	9.3	92.1	0.08	1.2	1.3

Box 1: On the specification of moisture content - particularly the moisture content of wood

There are two principal methods of expressing moisture content, particularly in reference to the moisture content of wood:

Oven-dry basis: moisture content is specified as the mass of water relative to the mass of oven-dry biomass, where oven-dry refers to after drying at 104°C to constant weight. The moisture content of wood is most often specified on the oven-dry basis within the wood products sector.

$$MC_{OD} = \frac{Mass_{water}}{Mass_{OD.wood}}$$

Wet basis: moisture content is specified as the mass of water relative to the total mass being the mass of oven-dry biomass plus the mass of water. Wet basis moisture content is often easier to comprehend as it describes the fraction of the mass of a sample that is water.

$$MC_{wet.basis} = \frac{Mass_{water}}{(Mass_{OD.wood} + Mass_{water})}$$

4. Further information

FIAT thanks the Department of Climate Change the opportunity to submit comments on the discussion paper and we look forward to further constructive dialogue in the future. Please do not hesitate to contact FIAT for clarification or further information at:

Forest Industries Association of Tasmania
GPO Box 1682, Hobart, Tasmania, 7001
Telephone (03) 6224 1033, Fax (03) 6224 1030
Email fiat@fiatas.com.au

Terry Edwards
CEO - Forest Industries Association of Tasmania

Appendix - Calculations

The following table depicts the calculations made in generating the values in Figures 1 and 2 and Table 1.

energy value & moisture content

OD mass (tonne)	MC dry	MC wet	mass water (tonne)	calorific value OD wood (GJ)	latent heat of vaporisation to 0%MC (GJ)	mass water above 12%MC (dry) (tonne)	green mass (tonne)	calorific value green wood (GJ)	**including latent heat water** calorific value green wood (GJ)
1	0%	0%	0	19	0.00	0.000	1.00	19.0	19.0
1	5%	5%	0.05	19	0.12	-0.070	1.05	18.1	18.0
1	10%	9%	0.1	19	0.25	-0.020	1.10	17.3	17.1
1	12%	11%	0.12	19	0.29	0.000	1.12	17.0	16.7
1	17.6%	15.0%	0.18	19	0.43	0.056	1.18	16.2	15.8
1	20%	17%	0.2	19	0.49	0.080	1.20	15.8	15.4
1	30%	23%	0.3	19	0.74	0.180	1.30	14.6	14.1
1	40%	29%	0.4	19	0.98	0.280	1.40	13.6	12.9
1	50%	33%	0.5	19	1.23	0.380	1.50	12.7	11.9
1	80%	44%	0.8	19	1.96	0.680	1.80	10.6	9.5
1	100%	50%	1	19	2.45	0.880	2.00	9.5	8.3
1	120%	55%	1.2	19	2.94	1.080	2.20	8.6	7.3
1	140%	58%	1.4	19	3.43	1.280	2.40	7.9	6.5
1	160%	62%	1.6	19	3.92	1.480	2.60	7.3	5.8