



Dr Anna Dacre
Secretary, House of Representatives Standing Committee
on Environment and Heritage
Parliament House
CANBERRA ACT 2600

Friday, 7 November 2003

Dear Dr Dacre,

Submission to Committee Inquiry: *Sustainable Cities 2025*

We refer to the Committee's call for submissions to the above inquiry, and enclose herein a submission from the Plantation Pine Framing Alliance.

The content of this submission relates to the following terms of reference:

- A 'blueprint' for ecologically sustainable patterns of settlement, with particular reference to eco-efficiency and equity in the provision of services and infrastructure;
- Measures to reduce the environmental, social and economic costs of continuing urban expansion; and
- Mechanisms for the Commonwealth to bring about urban development reform and promote ecologically sustainable patterns of settlement.

1. *Background*

By way of background, the Plantation Pine Framing Alliance (PPFA) was convened earlier this year as a task force within the timber industry. Its members are some of Australia's largest growers, processors and merchants of plantation pine, predominantly for use in construction of residential housing.

The main objective of the PPFA is to promote the continued use of plantation pine as the preferred material for constructing framing systems for residential houses. The group's activity is directed at the general public and professional builders, architects and engineers.

A recent focus of the PPFA has been to communicate the environmental benefits of plantation pine as a building material to the wider community, through advertising, public relations and other means. PPFA claims for plantation pine as a material, outlined in more detail later, are based on rigorous science and are well documented. Though relatively narrow in scope, the group's work is clearly relevant to the scope of the Committee's current Inquiry.

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2. Plantation pine industry position on Sustainable Cities

In the PPFA's view, any move toward more sustainable urban development must examine the environmental footprint of new urban infrastructure, and particularly residential housing.

We refer specifically to the building materials required to construct new dwellings, and the relative environmental impact of these materials.

The PPFA believes that housing regulations should incorporate strong incentives for homebuilders to use those construction materials with more favourable environmental profiles. Conversely, they should include disincentives to use environmentally harmful materials.

Housing Industry Association figures indicate that in the 12 months to 30 June 2003, construction of 169,000 new dwellings commenced. Another 158,000 are due to start in the 12 months to 30 June 2004.

The additional demand on existing energy and water resources that each of these new houses represents has been well anticipated. Indeed, recent moves by the New South Wales and Victorian state governments to mandate that from 2004 new houses incorporate energy-efficiency and water conservation measures are a direct response to this forecast additional demand.

Unfortunately, however, it has not been possible to inject into the sustainable housing debate thus far analysis of the industrial inputs required to build a new dwelling to any rigorous degree. These inputs can have widely varying impact according to the materials used. While a number of models under development – e.g. BASIX and NABERS – will include these in a broad assessment of sustainability factors, there is considerable scope to accelerate progress on this issue.

3. Comparing the environmental footprint of timber, steel and other materials

Typically, a new house will incorporate several or all of the following materials: hardwood and softwood timber, steel, aluminium, concrete, brick, masonry and textiles.

Structural components to the house - such as roof and wall frames, trusses and joists - are generally limited to timber (mostly softwood such as pine), steel or masonry.

The decision to use a given material in the construction is generally a discretionary one, based on the builder or homeowner's personal preference, cost or availability. To date, environmental implications have not entered the equation, despite evidence that the eco-footprint of timber is far less damaging than that of steel or masonry.

Greenhouse emissions

In June 2003 the Co-operative Research Centre (CRC) for Greenhouse Accounting released a study into greenhouse emissions associated with manufacture of different building materials. Its study used a lifecycle-based model developed by BHP, and

applied in conjunction with the University of Newcastle's Centre for Sustainable Technology.

The CRC study found that the manufacture of a plantation pine frame for a standard 4-bedroom house (180 sqm) generated 0.4 tonnes of carbon dioxide, compared to 2.7 tonnes to manufacture steel framing for the same house. The difference, 2.3 tonnes, equates roughly to the amount of carbon dioxide emitted by an average car travelling 8000 kilometres.

Embodied energy

Timber used in building has also been found to have lower levels of "embodied energy" than concrete, steel and aluminium, for example. Embodied energy in this context is the energy required to manufacture, transport and install the material.

A research report "Environmental Properties of Timber", commissioned by the Forest & Wood Products Research & Development Corporation in 1996, showed the manufacture of steel for building required 384 times more fossil fuel energy per unit volume than manufacture of timber, and 23 times more energy per unit mass. Generally, the study found use of timber as the predominant material in wall construction was linked to lower levels of embodied energy in a building. These findings are summarised in more detail below.

Material	Fossil fuel energy (MJ/kg)	Fossil fuel energy (MJ/m³)
<i>(Rough sawn) timber</i>	1.5	750
<i>Steel</i>	35	288,000
<i>Concrete</i>	2	4800
<i>Aluminium</i>	485	1.1 million

Additional benefits

As well as its superior energy-efficiency, plantation timber provides a range of additional benefits to the Australian environment. Plantation timber is a renewable and sustainable resource that not only stores carbon industrial CO₂ emissions, but which is recyclable and ultimately biodegradable. Much of the increasing area of land being dedicated to plantations is marginal land with limited potential for other agricultural use. Once established, new softwood plantations assist in rejuvenating their environs, easing soil erosion and salinity pressures.

These ancillary benefits that commercially managed plantations provide to rural and farming communities can be expected to spread as the plantation sector continues its current growth path.

Australia's State of the Forests Report 2003, released by the Bureau of Rural Sciences last August, indicates that commercial timber plantations have increased by an average 87,000 hectares each year for the past five years. Land area under commercial plantation in Australia currently stands at 1.6 million hectares, which the industry has committed to doubling within 15 years. Some 164 million hectares – 21% of Australia's land mass – is classified as forested land.

The analysis above refers to timber generically in building. Given that the overwhelming amount of timber used in building, particularly for structural work, is plantation pine, the benefits attributed to timber can be read as applying to plantation pine.

Translating good environment management policy into housing policy

In the PPFA's view the above analysis, which is only a snapshot of the available body of research into the environmental and lifecycle profiles of construction materials, presents a compelling case for embedding appropriate incentives/disincentives into the building materials market.

Applying the different emissions profiles above for timber and steel, for example, to the estimated 158,000 new homes for which the HIA forecasts construction will commence in 2003-04, reveals sobering results.

Rough estimates are that building all of these houses with steel frames results in 426.6 kilo-tonnes of CO₂, compared to the 63.2 kilo-tonnes generated if they are built using timber frames. (This example is indicative only; the PPFA understands that not all of the 158,000 forecast new dwellings are necessarily four-bedroom on 180 square metres.)

Extrapolate this scenario over the 22 years to 2025 and the scope for dramatically improving the ecological footprint of new housing stock built in this time, through choice of materials, becomes apparent.

Policy recommendations

It is clear to the PPFA that a carefully calibrated Sustainable Housing Policy, developed by the Federal Government in consultation with relevant State and Municipal instrumentalities can help deliver the favourable scenario outlined here.

Such a policy would have the central objective of encouraging builders and their customers – homeowners – to choose a more sustainable, eco-friendly mix of materials for construction.

The PPFA would have no hesitation in endorsing strongly a policy framework that included any or all of the following measures:

- Judicious use of financial incentives or disincentives to encourage the use of renewable materials and/or materials with favourable eco-profiles, where the use of such materials is discretionary;
- Clear targets, binding or non-binding, committing commercial developers to achieving certain levels of materials usage in residential developments;
- Incentives to stimulate supply and production of preferred materials such as plantation softwood, thereby making such materials more competitive in the market;

- Consumer education to make eco-friendly materials more attractive in building.

These measures would complement the industry's own initiatives to influence consumer behaviour, which include plans for increased eco-labelling of plantation products using the Australian Forestry Standard - AFS, ISO 14000 and other means.

This shift will not be to the economic disadvantage of homebuilders. Indeed, plantation timber as a material has been considered the most cost-effective material for structural construction, as reflected in the fact that 90% of homes are built using timber frames.

Rather, the mix of measures described help bring about a situation in which, all other things being equal, eco-friendly materials such as plantation timber become the default building material of choice.

4. Conclusion

It is encouraging to note that two of the case studies attached to the Committee's own *Sustainable Cities 2025 Discussion Paper* refer explicitly to the use of plantation timber in construction, and the planting of trees to offset the high levels of embodied energy associated with construction.

As a major stakeholder in the future direction housing and urban development, the PPFA believes that it is time to include far more rigorous assessment of the environmental impact of building materials in planning frameworks for sustainable cities. Coupled to this must be measures to hold Governments, builders and homeowners more accountable for the impact their construction choices have on the environment.

The PPFA is pleased to have this opportunity to contribute to the Sustainable Cities 2025 Inquiry, and I am happy to provide any information the Committee requires to define the environmental performance of the Australian plantation estate and products derived from it.

Please contact me on (03) 9875 5022 if you have any questions about this submission or require more information.

Yours sincerely,

Nick Livanes
Project Manager, PPFA