



FIREWOOD: SUSTAINABLE AND APPROPRIATE ENERGY SOURCE

*This letter was published in **Renew Magazine** issue 90, Jan 2005, by the Alternative Technology Association (Melbourne Australia) <http://www.ata.org.au/>*

It was in response to an article, by a contributing editor, Lance Turner, "Green Heating Options" in which firewood was rated as the least environmental heating option. The editorial response to my letter was essentially that evidence shows that wood users are not responsible in either their sources of fuel or management of heaters and so consumption of high quality fossil fuels (natural gas) supplied by centralized corporate monopolies is the most environmentally and ethically sound option.

*It is ironic that the stance by the editors in a cover story about greywater use for garden irrigation in Melbourne in the same issue of **Renew** was quite different from their attitude to wood. Survey results of the increasing use, despite its continuing "grey" legal status, were used to emphasise the need for user education to maintain soil fertility and avoid health risks rather than treating grey water as environmentally damaging and a health hazard. Surely the same flexibility should be applied to wood use which saves gas, a much more precious resource than water by most measures.*



HOLMGREN DESIGN SERVICES

The source of permaculture vision and innovation

www.holmgren.com.au

WOOD HEATING ENDORSED

I was impressed to read in issue 88 of **Renew** the broad range of articles and ads for products relating to renewable energy that are covered in the magazine these days. However I was dismayed by your anti firewood stance in “Keeping warm this winter”

Your assertion that most firewood in Australia comes from “old growth forests of ancient trees sometimes more than 1000 years old” gives the impression that firewood is coming from iconic tall wet public forests. In fact, half the firewood in Australia is harvested by private individuals mostly from private land¹. Riverine forest (mostly red gum) and Woodlands (mostly box-ironbark) are the major sources of commercial firewood but there is also significant harvesting as salvage after logging (in regrowth forests) and plantations².

The effects of firewood harvesting on those forests and woodlands ranges from very beneficial to very detrimental. In a general article about heating options written for a predominantly urban audience I wouldn't expect you to cover that complexity, but giving the impression that anyone using firewood is contributing to destruction of pristine forests is highly misleading to say the least.

Your reference to masonry heater technology as the most efficient and cleanest is useful but you could also have mentioned combustion cooking stoves providing hydronic heating (as well as hot water and cooking) as efficient use of fuel for multiple functions. For example our Bosky combustion stove has not needed a flue cleaning in over two years of continuous use, an indication of low pollution from moderately efficient technology, proper wood drying, and stove management.

You point out that the pollution created by wood burning varies greatly depending on fuel and heater management, but fail to mention that wood heating has lower greenhouse gas emissions than any other fuel heating³. Even poorly managed woodlands supplying wood heaters (60% efficient) up to 400 kms distant, have a net greenhouse gas production of one third that of natural gas and one tenth that of electricity⁴. The figures for sustainably managed regrowth native forest are one third that of woodland systems while new plantations managed for timber and firewood have no net carbon dioxide emissions and actually take 0.17kg of CO₂ out of the atmosphere for every kWhr of heat produced.

These figures from an authoritative and recent study by CSIRO, reinforce what we have been teaching for 15 years, in both Permaculture Design Courses and guided tours of Melliodora⁵, that wood is the most sustainable and environmentally sound form of heating

1 Driscoll, D.A. et al **Impact and use of firewood in Australia** CSIRO Sustainable Ecosystems,2000

2 Eg. Sugar Gum in western Victoria

3 Keryn, P et al **Life Cycle Assessment of Greenhouse Gas Emissions from Domestic Woodheat** CSIRO Forestry and Forest Products for Australian Greenhouse Office October 2003

4 0.11kg CO₂/kWhrs compared to 0.31 for gas and 1.00 for electricity from coal

5 See www.holmgren.com.au

(after behaviour change, conservation strategies and passive solar design, which you also mention).

Heating only requires low quality energies such as passive solar gain or firewood. If we use high quality energies such as electricity for space or water heating then this is wasteful (and therefore environmentally damaging in some way) whether that electricity is from coal or renewable sources. We should reserve electricity for lighting, communications and electric motors.

The orthodoxy that natural gas is the default environmentally sound source of heating, that you appear to endorse without even the need for a paragraph of explanation, ignores the fact that natural gas is also high quality energy, the ideal transportation fuel. Although gas heating is a step ahead of using electricity, it is still like using structural quality timber for firewood, in other words, a waste.

In a more enlightened sustainable and low energy future, the very real problems of localised air pollution from wood burning in cities needs to be addressed by better training of firewood users, better designed wood burning stoves and most importantly, use of cleaner burning charcoal produced in sustainably managed forests using modern wood gasifier technology which recovers the waste heat.

I look forward to more articles in **Renew** exploring both the practical options for wood heating and management as well as new and emerging technologies for using wood fuel.

David Holmgren

Co-originator of the Permaculture concept