

Energy from wood – not so sexy, but a key part of Australia's future

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AUSTRALIA'S FUTURE**

Infocus:
The Newsletter of Plantations for Australia

Australia could within 15 years be producing up to 20% of its energy needs from woody waste, but interestingly this fact to date has been almost totally ignored in the present debate. The media is informative about nuclear and fossil fuels energy, with the occasional mention of renewable sources of electricity production only touching on wind and solar energy. The potential for woody biomass as fuel for off-the-shelf cost-effective energy plants for some reason is being overlooked. Government pronouncements and speakers rarely mention bioenergy except in the odd comment about biodiesel, or ethanol in petrol. Yet in central Finland up to 45% of industrial and household energy consumption is produced by power plants burning woody waste. This is mainly sourced from thinning or harvest of private forest, or timber processing waste. Overall in Finland, the world leader in industrial bioenergy production, it is over 22%.

The European Economic Community has a short-term goal of 12% of energy to be produced from renewable sources by 2010. Austria already produces about 18% from wood, with central heating or power plants in many towns. The smaller plants are often supplied with their wood chip fuel by farmer syndicates. In Sweden the figure is almost 20%. The Swedes have recently decommissioned two nuclear plants, and are decommissioning their remaining seven nuclear plants as soon as they can replace them with renewable energy sources, mainly with wood-fueled plants. The Germans are aiming to similarly decommission all their nuclear power plants. In Bavaria taxes on fossil fuels are used to generate subsidies for municipalities to develop co-generation plants fired by a mix of municipal waste and woody waste.

Denmark and the other Scandinavian countries use the same general principle. Their heating oil and vehicle fuels are taxed on the basis of their energy value, and part of the revenue raised is used to lift the price paid for chipped forest thinnings and harvest waste delivered to the power plants. In Finland there is some incentive subsidy paid for the thinning process and to offset transport and chipping costs.

In September 2005 there was an international conference in Finland about the latest available technology of woodchip-fired power generators. These come in all sizes from about 2 MW-enough for a small rural community- to over 200 MW, enough for a city of a hundred thousand residents. An equally informative one was held some months later in Norway. Scientists and senior public servants from Australia should have attended one or both of these. They are held at least every two years.

The great potential for this energy source can be found by the individual by a visit to the relevant Finnish website www.finbio.fi. The Swedes have a similar one at www.svebio.se. The Danes, who are leaders in using straw as a biofuel, are at www.danbio.dk. A websearch using 'bioenergy' plus the country name will get you to similar sites for Germany and Austria. The British are currently building a major powerplant near Lockerbie in southern Scotland to be fueled by woody biomass. This will use about 200,000 tonnes per year of thinnings and harvest waste from plantation forestry management in the area (Victoria currently exports five times that amount, mostly from chipped eucalypt logs). In the USA, despite a primary renewable energy focus on wind, solar and hydroelectricity, there are many websites detailing the growth in the bioenergy sector. A general site is www.bioenergy.ornl.gov. For an international perspective visit www.ieabioenergy.com.

Woody waste comes from several main sources. In practice, for a 10MW or larger plant, it would come from an extensive, sustainably managed, private forestry industry. Sawlog-producing plantations are normally thinned twice as part of good management. Five thousand hectares of managed sawlog plantings progressively established, whether as small sawlog woodlots across five hundred farms, or as several large industrial plantations, will annually produce enough chipped thinnings and harvest waste to fuel a significant bioenergy plant. Waste wood from building demolition or renovation is another significant source, largely going to waste in Australia. In some countries, including Denmark, all flammable municipal waste must be separated by law by householders for energy generation or recycling.



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A key issue in favour of bioenergy as a by-product of a sustainably managed plantation timber industry is that it is approximately carbon neutral. For each tree cut down at least one more is planted, or the coppice regrowth is managed. In addition appropriately-sited trees are playing a role in salinity mitigation, improving water quality, or providing habitat. The logs from harvested trees are milled, with up to 50% of the volume going into durable products. These may keep the carbon component sequestered for 100 years or more.

Crucial for reduction of greenhouse gas emissions, the use of woody biomass for generating energy means that it reduces the fossil fuel used by that amount of energy. And the ash from the clean wood combustion process is a useful product in itself as a potential component of agricultural fertiliser.

Off-the-shelf power plants fueled by woody biomass are relatively cheap, have low visual impact, and come in all sizes. They can be fueled by alternative solid flammable wastes, such as straw, nut husks or olive pits, and can be the source of heat and steam for adjacent industry.

Andrew Lang is a Churchill Fellow whose 2003 study included the use of woody biomass for production of energy in Scandinavia. He returned to look at other forestry management aspects in 2005 and plans more in-depth study in mid-2006. He is a farmer, farm forester, and chairman of the innovative SMARTimbers marketing cooperative.