

RECEIVED

30 APR 2007

PO Box 18
Ensay
Australia 3895
ngarak@bigpond.com

ENVIRONMENT AND NATURAL
RESOURCES COMMITTEE

25.4.07
Secretary
Impact of Bushfires Inquiry
Environment & Natural Resources C'tee
Parliament House
Spring St
Melbourne 3000

SUBMISSION

NO. 020

Dear Sir/Madam,

enclosed rough notes on a proposal to use microgenerators to remove hazardous waste in bushfire prone areas and convert into carbon neutral electricity.

Although my outline specifies Swifts Creek it is applicable to all remote communities in the Alpine and sub alpine districts such as Dargo, Licola and Buchan.

Waste is currently being burnt in our district by DSE and the River Catchment Authority. Other waste is produced by the timber mill. The East Gippsland Shire Council is also looking at the idea and the Omeo Business and Tourist Association has also expressed support for the idea.

Note that the generators referred to in attached articles are co-generators which produce electricity and heat. Much smaller generators known as 'green gasifiers' are made down to about 25 KW - almost farm size.

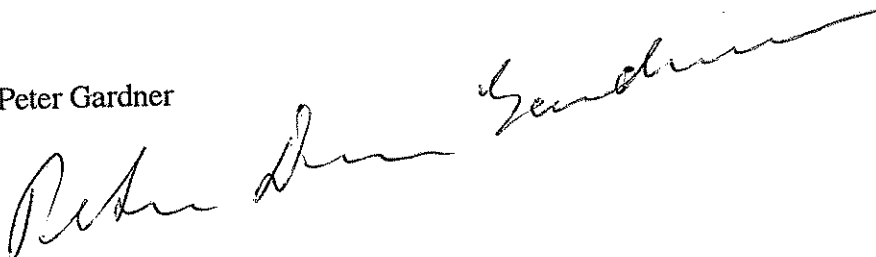
The project could be also adopted in conjunction with plantations grown specifically for the generators, and the prunings from plantations grown as carbon sinks.

I do not have the time or energy to flesh out the idea but believe that many efficiencies of the use of resources and economies of scale would operate if the operators were the DSE.

Whilst the use of microgenerators will not prevent bushfires they can contribute to the prevention side by providing increased security for buildings and communications and at the same time make a small contribution to reducing use of CO2 and the problem of global warming.

Yours

Peter Gardner



Microgenerator-Fire Plan - Rough Notes for pilot plant at Swifts Creek

Aims

1. to use a microgenerator to
 - a) burn biomass as a means of using up fire hazardous material around threatened towns
 - b) burn biomass that would be consumed in a large scale wildfire as has occurred in 2003 and 2006/7 or in back burns associated with those operations
 - c) burn biomass along roadsides to help them (i) work as future fire breaks and (ii) to ensure that any wildfire will only briefly close these major roads
 - d) burn biomass from the Tambo riversides - especially dead material and that killed by the catchment management authority
 - e) burn biomass waste from private property and from East Gippsland Shire Council tip
 - f) burn waste material from the Swifts Creek Sawmill
 - g) burn all waste from logging coups

2. By doing so

- a) progressively build substantial fire breaks along roads to provide increased protection for small communities and their communications by removing biomass (not living trees though some pruning may be necessary)
- b) increase full time employment drastically in the district
- c) progressively reduce the need for (i) for back burning in wildfires and (ii) control burning
- d) be an environmentally attractive use of fuel ie that it is carbon neutral and therefore does not add to global warming and if combined with using waste rather than removing trees and/or plantation thinnings may prove to be carbon sinks
- e) possibly reap a number of other non tangible benefits

2. Product a) electricity that will be fed back into the grid and sold to the electricity authority/company at the same rates as paid to alternative technology generators (ie green power rates). Note that the use of biomass as fuel is carbon neutral - only if more trees are planted than harvested is the whole process a carbon sink. In Finland these generators are run on the prunings from plantations and if the logs are preserved in long term use of timber then these are carbon sinks. Only plantation known to author is the SC pine plantation at Doctors Flat.

- b) hopefully a carbon rich ash which with minimum processing can be returned to the land
- c) both these operations should provide some revenue though they will be probably be sub economic. Associated activities may provide further revenue (see below)
- d) non tangible returns of the reduction of fuel. These may be measurable in the long term by reduced costs for fire fighting

4. Procedure. The obvious procedure is to start small using local resources as much as possible including co-operating between various authorities. As the economics and the problems associated with organisation etc are worked out the plant may be enlarged to fit the size for a steady and sustainable supply of biomass. The original plant can then be re-established at another remote community or used locally at either the local mill or recycling place (tip).

2. Location a) Swifts Creek Dept of Sustainability seems the obvious place. Initially they may need to co-operate with the mill and the tip to help establish the regular supply of biomass b) other possible locations are the tip and the mill because both have a guaranteed source of biomass. It may be that the Swifts creek tip alone cannot provide sufficient biomass for the continuous use of the microgenerator and hence they may be

better located at larger places of this kind eg Bruthen or Bairnsdale.

3. Co-operation Especially in the initial Stages Co-operation would be required between

- a) various levels of government
- b) various government departments
- c) between SC DSE and private businesses (mill, farmers)
- d) therefore a liaison officer/facilitator would be required.

4. Funding would be required for

- a) labour
- b) initial purchases of plant & establishment costs
- c) for planner/supervisor/engineer

from

- a) commonwealth & State govts for (i) carbon neutral energy generation (ii) increased fire protection for local communities
- b) from within various departmental
- c) from revenue generated
- d) work for the dole?

5. Economic Efficiencies

- a) should aim at getting the best use of the biomass as possible. Timber that is suitable as alternative timbers (eg blackwood) should not be used. Likewise timber suitable for firewood. In the long term green material may be more suitable for the production of ethanol or methane gas.
- b) the use of vehicles returning from bush should if otherwise empty carry in suitable biomass. numerous other efficiencies probably will come to light.

6. Advantages

- 1. Added fire protection. Compare this with the enormous amounts that have been spent on controlling the last 2 major wildfires.
- 2. The biomass can be removed at any time of year and thus whether in quiet fire seasons or in wet years where control burning cannot be carried out safely biomass removal can proceed as usual.
- 3. increased local employment depending on how successful
- 4. That it is carbon neutral and does not add to global warming
- 5. because of these points is politically attractive

7. Other Possibilities

A wide range of other longer term possibilities exist including establishing tree plantations as carbon sinks. The use of black wattle in conjunction with white box could provide quick growing biomass whilst the slower growing trees can be established. These may have monetary value as if/when carbon trading is established. Co-operation with farmers and some grazing may be necessary to help establish plantations and reduce their fire risk. Other associated activities may occur such as the removal biomass from roads, a nursery for planting local species. With any substantial increase in fuel prices or the price of electricity increased the export of woodchips may prove sub economic and therefore usable in generators. Note that the timber in plantations, roadside control areas etc needs to be managed

8. Conclusion

A small pilot program should be implemented now. No studies are required. The appointed organiser of the project should make a trip to Finland, Sweden, Denmark. Money that may have gone into any feasibility study should go into the establishment of the project.

Seeing the wood waste from the trees

The Age 3/17

Australia should be paying closer attention to Europe on biofuels, writes **Andrew Lang**.

AUSTRALIA could within 15 years be producing up to 20 per cent of its energy needs from woody waste, but this has thus far been almost totally ignored.

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 per cent of industrial and household energy consumption is produced by power plants burning woody waste. This is mainly sourced from thinning or harvesting of private forest, or timber processing waste. Overall in Finland, the world leader in industrial bioenergy production, it is more than 22 per cent.

The European Union has a short-term goal of 12 per cent of energy to be produced from renewable sources by 2010. Austria already produces about 18 per cent 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 per cent. 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-fuelled 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. There, 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 some incentive subsidy is paid for the thinning process and to offset transport and chipping costs.

Last September there was an international conference in Finland about the latest available technology on woodchip-fired power generators. These come in all sizes, from about two megawatts — enough for a small rural community — to over 200MW, enough for a city of 100,000 residents. An equally informative conference was held some months later in Norway.

The Finnish website www.finbio.fi shows the great



PICTURE: ANDREW DE LA

Sawdust to energy: the process of using wood waste products as an alternative fuel has largely been ignored to date in Australia.

P2

potential for this energy source. The Swedes have a similar website at www.svebio.se. The Danes, leaders in using straw as a biofuel, are at www.danbio.dk. A web search using "bioenergy" plus the country name will bring up similar sites for Germany and Austria.

The British are building a power plant near Lockerbie in southern Scotland that will be fuelled by woody biomass.

This will use about 200,000 tonnes a year of thinnings and harvest waste from plantation forestry management in the area (Victoria exports five times that amount, mostly from chipped eucalypt logs).

In the US, despite a primary renewable energy focus on wind, solar and hydro-electricity, there are many websites detailing the growth in the bioenergy sector. A general site is www.bioenergy.ornl.gov.

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 scattered farm sawlog woodlots

across 500 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, householders must by law separate all flammable municipal waste for energy generation or recycling.

A key issue in favour of bioenergy as a by-product of a sustainably managed plantation timber industry is that it is almost 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 per cent 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 as a potential component of agricultural fertiliser.

Off-the-shelf power plants fuelled by woody biomass are relatively cheap, have low visual impact, and come in all sizes. They can be fuelled 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 farmer, farm forester, and chairman of the innovative SMARTtimbers marketing co-operative.

Sweden shows the non-nuclear way to cut greenhouse gases, writes Andrew Lang.

SOME influential politicians appear dazzled by the nuclear option as the solution to reducing greenhouse gas emissions. By contrast, many Organisation for Economic Co-operation and Development countries have turned from nuclear to another option of base-load power that has been effectively ignored here.

Sweden, Finland, Austria, Britain and Germany, among others, are investing heavily in energy plants fuelled by woody waste, often mixed with flammable municipal waste.

Sweden, once a significant importer of Australian coal, has gone well along this path and is now generating about 20 per cent of its energy needs from woody biomass. This nation of about 8 million now has about a quarter of the Australian emissions of greenhouse gases per head, while maintaining a lifestyle most Australians would envy. Some cities and municipalities are as low as a sixth of Australia's per-head emissions, and aim to reduce them further. Many strategies Sweden uses can be readily introduced here, with the scope to rapidly and cost-effectively halve our greenhouse gas emissions by 2020.

Why has Sweden adopted a policy to phase out its reliance on nuclear reactors and fossil fuels and switch to other energy sources? The answer is complex, involving its history, the well-managed forestry resource, and its political philosophy. It also is influenced by its recent experiences of the radiation fallout from Chernobyl, and the acid rains due to polluting Soviet heavy industry.

The country was hard hit by the two oil shocks of 1973 and 1976. It now has a stated aim of being independent of imported fossil fuels by 2030. Its cheapest domestically available fuels for energy generation are wood and peat. Since 1990, it has decommissioned two of its nine nuclear plants, and its policy is to eventually close them all, as energy

production from renewable sources and more efficient energy use allows. Sweden's share of energy from biomass is now about 20 per cent, projected to rise to 40 per cent by 2025. While much of this is heat energy for households and industry, combined heat and power (CHP) plants of all sizes up to 500 megawatts throughout the country also put electricity into the national grid.

The city of Vaxjo, in central Sweden, claims the lowest per-head emissions in Sweden and the European Union, at 3.5 tonnes. The city aims to reduce this to about 2.4 tonnes by 2010. This compares with the EU overall at 11 tonnes and the US — with its many nuclear reactors — about 24 tonnes. To achieve this requires conversion of the city transport fleet to run on biofuels, encouraging greater use of biofuels by private car owners (the use of 85 per cent ethanol is doubling each year), organising more biofuel outlets at service stations, developing more bicycle paths and reducing

Sweden now has a stated aim of being independent of imported fossil fuels by 2030.

household electricity use through increased efficiencies and awareness.

Electricity and heat for Vaxjo houses, institutions and industry comes from CHP plants fuelled by chipped wood waste and flammable dry municipal waste. The Vaxjo sewage plant is producing enough biogas (methane) to fuel 100 cars year-round, in addition to heat for the plant. Sweden has industrialised the old technology of methane production by fermenting organic material, including grass and food waste.

The supply of biofuels will not be from agriculture, but from forestry byproducts. Vaxjo is involved in the cutting-edge technology of the woody biomass gasification plant at the nearby city of Varnamo. This is the EU pilot plant developing the technology for cost-effective conversion of woody biomass to transport fuels such as dimethyl ester (DME). Vaxjo has installed a DME fuelling outlet for trial

vehicles in the municipal fleet.

In Australia, woody biomass is largely underutilised. Expansion of the plantation sector of the industry could increasingly include well-sited dispersed commercial sawlog woodlots on farms. These dispersed woodlots could potentially total 5 million hectares across all states in 30 years. When properly sited

these will not have a significant impact on stream flows, but will have great environmental, social and economic benefits, including an increasing bank of sequestered carbon.

It has the potential to solve many of the environmental and economic problems facing Australia's rural areas.

The plantation industry

PER
P. GARDNER
ESSAY
51573246

Energy solution is growing on trees

byproduct can fuel perhaps 30 per cent of base-load energy needs, and result in a safe, rapid and significant reduction in greenhouse gas emissions. It is carbon-neutral energy, and most of the ash can be recycled (Sweden recycles more than a million tonnes of ash from bioenergy plants a year). All upside, environmentally.

beneficial, relatively fast to implement, and cost-effective. The puzzle is why it is not receiving the federal political support it would appear to warrant.

Andrew Lang attended the 2001 World Bioenergy Conference in Sweden. He is a Churchill Fellow, farm forester and chairman of SMARTtimbers Co-operative.

AGG 20/2/07