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Submission to The proposed modification (DA 183/1993) of the Redbank power station to substitute wood for coal.

Introduction

The Clarence Environment Centre has maintained a shop-front in Grafton for over 32 years, and has been closely involved with environmental issues, particularly those associated with forestry, since its formation. As a result, we have serious concerns over the Redbank Power Station proposal, and the use of wood to generate electricity generally. The ongoing spin that somehow attempts to claim that because wood is renewable, burning it for electricity generation is clean, has to be rejected. The reality is, **wood-fired electricity generation is highly polluting and poses a real threat to the environment and to human health!**

Almost exactly 10 years ago a smaller wood-fired power station was proposed for Bega by the Japanese company, Nippon Paper. That proposal failed to get approval for a range of reasons including the resultant environmental damage and pollution it would cause. However, it seems that those who spot a potential source of money, regardless of the environmental and social costs, will continue to put forward these proposals.

What is particularly galling about the Redbank proposal for conservationists and environment groups such as the Clarence Environment Centre, is the blatant attempt at 'greenwashing'. The naming of the company "Verdant Earth" is an example, along with claims that their operation "*will utilise wood waste that would otherwise finish up in landfill, and "provide sawmillers with a market for timber residues"*", while ignoring the main source of timber which will come in the form of logs from public and private native forests'.



The company supplying the wood chip, Sweetman Renewables, which brazenly plagiarises the Recycle logo as their own, and splashes the call to "*Join the Journey to Zero Emissions*", **across their home page** (note the cute little twig protruding from the recycle logo), makes identical claims. Its website claims that it sources its: "*Biomass supply through the utilization of ultra-low-quality logs, sawmill residues and the sourcing of wood waste from both forests and other wood processing facilities to provide a significant new revenue stream*". To say this is misleading is a mammoth understatement.

We all know that Forestry Corporation is clear-felling state forests, and that a very small percentage of the trees felled in that process actually ends up as saw logs. That leaves the balance, including mature unmerchantable trees, either non timber species or defect trees, and even old-growth habitat trees, i.e., “*ultra-low-quality logs*”, to be chipped and burned. **These are not “waste”, they are critical habitat for threatened species!**

Background

Existing biofuel electricity generation is currently restricted to co-gen operations mainly attached to sugar mills, in northern NSW (see following table).

These [power stations](#) burn [biomass \(biofuel\)](#) to generate some or all of the electricity they produce.

Power station	<u>Max. Capacity</u> (MW)	<u>Turbines</u>	Fuel Type	Conveyance
Broadwater Sugar Mill	10	1	bagasse	on-site
Broadwater Biomass Co-Gen	30	1	bagasse/wood waste	on-site & truck
Condong Sugar Mill	3	1	bagasse	on-site
Condong Biomass Co-Gen	30	1	bagasse/wood waste	on-site & truck
Harwood Sugar Mill	4.5	3	bagasse	on-site
Visy Paper, Tumut	21	1	black liquor	on-site

The development of co-generation plants at the 3 sugar mills was subsidised by Australian taxpayers, a proposal sold by the proponents built on a lie. The development of those plants was justified by the proponents who claimed the electricity would be generated through the burning of bagasse and sugar cane trash, both of which have been traditionally burned anyway. However, the burning of cane trash was very soon ruled out as being too difficult, and in recent years, massive amounts of undersized logs from plantations and native forests have been burned instead, and not only during the cane crushing season, but year-round.

Coarse woody debris is not waste

Coarse woody debris, otherwise described as “*wood waste from forests*”, is one wood source targeted as biofuel. However, that wood material is anything but waste, and provides a wide range of naturally occurring services that are essential for the maintenance of healthy forest ecosystems.

Webber and Bauhus, from the Australian National University and the University of Freiburg, presented their Paper, “Assessment of Eucalyptus obliqua coarse woody debris decay rates” in 2003, and concluded that: “*Besides being important as a habitat for many forest organisms, coarse woody debris (CWD) performs other important functions. The logs act as slow-release fertilisers, continually releasing nutrients back to the forest environment as they continue through the slow decomposition process*”.

They also found that CWD, “*also act as obstacles to water flowing over the soil, reducing the speed of the water, which in turn reduces erosion, albeit to a small extent*”.

We assert that the removal of that woody debris for biofuel will involve machinery which results in a high degree of soil disturbance, probably even greater than the logging operation itself, and the subsequent erosion resulting from the increased speed of water flow will be significant. Clearly, Webber and Bauhus failed to consider that aspect when claiming the debris only slows water flow *“to a small extent”*.

The Webber and Bauhus thesis went on to explain that: *“Any reduction in erosion will help, to some extent, reduce the soil and nutrients from being transported into creeks and other water bodies, which, in turn, helps to reduce turbidity and nutrient loading of the aquatic environment. Turbidity of the aquatic environment reduces the light received by aquatic plants, reducing their ability to photosynthesise, and produce their own food. Increased nutrient loading of aquatic environments leads to increased intensity of algal blooms, which reduces the drinking-quality of the water. (Increased algal blooms can also lead to a dramatic increase in the zooplankton which prey on the algae, which can, in turn, lead to a depletion of the oxygen content of the water, subsequently resulting in the death of aquatic animals that require oxygen; the so-called ‘fish kills’.)”*

The research conclusion rightly states that: *“Coarse woody debris is an extremely important element in the terrestrial environment, which has generally been ignored by environmental managers in the past. The impact of the slow decay of the eucalypts requires that environmental managers need to take CWD seriously, and formulate extensive management strategies to overcome the effect of environmental degradation caused by extensive log removal in the past, especially in nature parks and reserves, and water catchment areas.”* In short removal of woody debris is ill considered, to remove it for the purpose of burning, thus producing greenhouse gas emissions, is lunacy.

Note: In early 2021, the Coffs Harbour – Clarence Valley Regional Water Supply was unable to use water from the Nymboida River for months on end because of excessive turbidity in the water. Logging activities, which included clear-felling in both plantations and native forest in the catchment, was a major contribution to that pollution

Climate change implications

There is now no argument over what needs to be done to prevent catastrophic climate change, we have to reduce greenhouse gas emissions. Even if ‘Verdant Earth’s extremely dubious claims that the Redbank Power Station operation would carbon neutral, courtesy of the fact that the mature trees they cut down will, over time be replaced by naturally regenerating saplings, “neutral” does not equate to a reduction.

It appears Verdant Earth Technologies is proposing to fire up the Redbank Power Station using 850,000 tonnes of dry woodchips per annum (about 1.2 million tonnes of freshly cut wood). The power station will generate over 2 million tonnes of CO² (carbon dioxide) every year.

Carbon neutral or not, those emissions are however, not solely CO². Along with that element there are a frightening array of other chemicals that are released. **Coal burning for the past century has seen the life expectancy of Hunter Valley residents lag way behind those of the rest of Australia, with rates of respiratory complaints far higher than elsewhere. So why allow that process to continue by burning wood.**

Air quality implications

A report prepared in June 2008 for the Canadian Ministry for Environment by Envirochem Services Ltd, identified no less than 90 chemical substances that were spewed into the atmosphere through wood-powered electricity generators. Half of those 90 compounds were identified as “Candidate Pollutants of Concern”, i.e., dangerous to human health, and here they are:

Acetaldehyde	Alpha-pinene
Beta-pinene	Carbon monoxide (CO)
Formaldehyde	Methanol
Naphthalene	Toluene
Total phenols	Turpentine
PAHs 2,3,7,8	Tetrachlorodibenzo-p-dioxin 2,3,7,8-
Tetrachlorodibenzo-p-furan	Hydrogen sulphide
Nitrogen oxides (Nox)	Beryllium
Cadmium and compounds	Chromium (II) compounds, as Cr
Chromium (III) compounds, Cr	Chromium (metal)
Chromium (total)	Chromium, hexavalent metal & compounds
Cobalt as Co metal Dust and fume	Cobalt carbonyl as C
Copper, Dusts and mists, as Cu ₃	Copper, Fume
Iron	Lead arsenate, as Pb ₃ (A ₂ O ₄)
Lead chromate, as Cr	Lead compounds
Magnesium	Manganese
Molybdenum	Nickel and compounds
Particulate matter (PM)	Phosphorus
Selenium	Silver
Thallium	Zinc
Arsenic and - inorganic arsenic compounds	Mercury
Hydrochloric acid	Sulphuric acid and
Sulphur dioxide (SO ₂)	

However, here's the crunch. While it is possible to filter out all those compounds, it is prohibitively expensive. An adequate filtration system, i.e., one that reduces emissions to acceptable levels, using good combustion practices and control; cyclones and filters; acid gases and scrubbers; and fuel and combustion modifications, costs about the same to run as the generation plant itself.

In short, at the very minimum, operating the filtration equipment doubles the cost of running the power station. Therefore, as is the current case with coal fired power generators which emit huge volumes of toxic substances, including carcinogens, a compromise has to be made between economic and social costs, and we end up with a filtration system that filters out just enough of these toxins to comply with what some bureaucrat has proclaimed to be a “safe level”. i.e., a second-rate filtration system that allows the operation to be price competitive.

It is critical for any combustion operation that a constant reliable source of fuel is available. Unlike the efficient 'coal face to furnace' operations of most coal-fired generators, this is something that cannot be provided by a timber resource, which may have to be trucked in from many hundreds of kilometres away.

This would require a wood-fired power station to maintain mountainous stockpiles of fuel on site, to protect against prolonged wet weather periods when logging is not possible. Such unsightly stockpiles pose their own unique health hazards through leaching of all manner of toxic substances into the soil and groundwater. In the USA, fuel shortages have been identified as a major problem for wood-fired generators, with household, and even more toxic industrial waste often substituted to keep the furnaces running.

That USA experience showed that the economic imperative of keeping the turbines running in the face of wood shortages, coupled with local governments faced with growing mountains of household and industrial waste, leads to the temptation to use wood-fired generators to double as industrial incinerators. It starts with burning waste building material including treated timbers, which invariably leads to more hazardous types of waste. In some cases, permission has been granted to burn treated wood waste, black liquor solids and/or paper sludges, and wood tar waste. In other cases, state agencies have allowed the disposal of their oily water by spraying it on their wood fuel.

So, what does this mean? Fibreboard plants use formaldehyde (a hazardous air pollutant) and other toxic glues such as isocyanate. The toxic constituents of these glued and otherwise treated wood products make them unsafe to burn. Particleboard and other processed wood products can come contaminated with chlorinated plastics that are burned since they're not easily removed. Also, wood waste can be contaminated with wood preservatives, binders, paints, glues, plastics, laminating materials or other non-wood substances.

Particleboard, flakeboard, plywood, fibreboard and manufactured wood, also have plastic laminates, chlorinated adhesives, or phenol and urea formaldehyde resins. Painted wood may include lead or mercury (particularly in demolition debris). Mercury has been used as a fungicide in paint. Treated woods are usually coated with creosote, copper chromium arsenate, or pentachlorophenol. Pentachlorophenol is a chlorinated compound, which will form dioxins and furans when burned. Burning wood treated with copper chromium arsenate (CCA) will release arsenic and chromium VI. Since copper serves as a catalyst in dioxin formation, any small bit of CCA-treated wood will greatly escalate dioxin emissions from industrial wood burners.

In the U.S some wood-fired power stations have been allowed to accept a certain percentage of chlorinated wastes, since wood waste suppliers are unable to completely isolate all vinyl-coated material. In construction/demolition wastes, there is likelihood of PVC (polyvinylchloride) contamination from many sources common in building materials. For example, all household electrical wire sold is coated with PVC plastic. Since this wire is made of copper, it's an extremely dangerous mixture to have burned, since the copper will catalyze increased dioxin formation out of the PVC.

Studies have already identified significant health implications, such as respiratory problems, for those living near coal-fired power stations (reference the 2013 Port Augusta cancer cluster), and similar problems are certain to accompany power stations using wood as a fuel. **This level of risk should not be entertained when we have such an abundance of non-polluting resources available to us.**

Who Pays?

Clearly, the burning of forest waste to generate electricity can never be competitive, so it seems inevitable that there will be more corporate welfare handed out to a timber industry that is continually propped up by the taxpayer.

The fuel supply will largely be supplied from our State Forests, which have cost tax-payers millions of dollars annually for the past 2 decades, despite logging at unsustainable levels.

If wood-fired power stations are built, our rivers and air will be polluted. These community assets will be devalued or even lost. Increased health costs associated with poor air quality will be likewise borne by the taxpayer, as will the road maintenance costs incurred by the thousands of trucks needed to transport the fuel to the generators.

In conclusion

The Clarence Environment Centre strongly feels there is no valid argument to support burning native forests to produce electricity. The process is highly polluting and will exacerbate global warming; would be a serious risk to human health, is uneconomic; will have negative implications for the health of river systems, and will have a hugely negative impact on biodiversity through damage to forest ecosystems.

Australia, indeed the world, is facing climate and extinction emergencies. Not only must we stop the destruction of biodiversity, we must be actively enhancing it. We have to protect and grow more forests to help store the excessive carbon dioxide which is posing a real threat to life on this planet.

Therefore, we urge the Singleton Council to reject any notion of burning wood for electricity generation out of hand.

Yours sincerely

John Edwards
Honorary Secretary.

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