

Victoria's Greenhouse Policy

The moment of truth

Australia Institute Webpaper May 2005

Summary

1. The Victorian Government is considering extending the operating life of the 40-year old Hazelwood Power Station to 2031. The power station is the largest single source of greenhouse gas emissions in Australia, and its brown coal allocations would run out in 2009.
2. About 340 million tonnes of CO₂ would be emitted from Hazelwood during the period of extended operation – far more than will be saved by national efforts to increase the energy efficiency of household appliances and industrial equipment.
3. The electricity that Hazelwood would produce could be generated with far lower emissions. The alternatives, mainly involving fossil fuels, could be somewhat more expensive, but the costs per tonne CO₂ avoided would be modest, and could be distributed equitably within and beyond Victoria.
4. The Victorian Government claims to be committed to reducing emissions, and already imposes mandatory solar water heating requirements, which save far less emissions at far higher cost than any of the alternatives to Hazelwood. The true test of its greenhouse commitment is whether it acts to prevent the extension of Hazelwood's operation.

On 27 April, 2005 *The Age* reported that an independent panel had recommended that the Victorian Government approve the release of brown coal resources to allow Hazelwood power station to operate until 2031.¹ Before the sale of the power station to the private sector in 1996, the former State Electricity Commissions of Victoria had planned to retire the 41-year-old plant this year.

Hazelwood has the distinction of being Australia's largest single source of greenhouse gas emissions, even though, at 1600 MW, it is only the sixth-largest power station. For every kilowatt-hour it generates, it produces more greenhouse gases than any

¹ 'Top polluting power station set for reprieve', *The Age*, 27 April 2005

other major power station in Australia. This is an unavoidable result of its age, its technology and the wet, low-grade brown coal it uses as fuel.

At present the coal allocations available to the power station run out in 2009, and the operator, International Power Hazelwood (IPRH) has applied for access to a further 355 million tonnes of coal ('West Field Phase 2') to allow the power station to operate until 2031. According to *The Age*, the expansion would see 'the relocation of the Strzelecki Highway, a smaller road, the Morwell River, two creeks, 11 families, a cattery, dog kennels, 155 trees of a nationally threatened gum species, and the town of Driffield'. No less importantly, it would also see the emission of 340 million tonnes of CO₂ over the extended life of the station according to the inquiry panel appointed by the Minister for Planning (and initially prevented by the Minister from considering the power station's greenhouse emissions at all).

On the very day *The Age* reported the Hazelwood story, the Business Council for Sustainable Energy conference was told that the expected greenhouse gas emission savings from Australians purchasing more efficient appliances, due to energy labelling and minimum energy standards, would total about 204 million tonnes between 2005 and 2020 (NAEEEP 2005).

In other words, the decision to allow Hazelwood to keep operating would totally negate the patient efforts of millions of Australians to reduce greenhouse gas emissions. They are doing so largely because they are saving themselves money through lower running costs, but also in response to Government exhortations to reduce emissions. In this regard, the Victorian State Government has been among the most vocal.

There are many alternatives to extending the life of Hazelwood. Most of the practical alternatives still involve the use of fossil fuels, but in ways that produce far less greenhouse gases. Renewable energy and energy efficiency can also help, but at their present stage of development will not be the whole answer.

The Inquiry Panel itself recognised that there are alternatives to Hazelwood, and estimated the greenhouse reductions possible - see Table 1. Even without considering renewables and energy efficiency, emissions could be reduced between 39% and 71% through using brown coal with a new generation technology (Integrated drying and gasifying combined cycle, or IDGCC), black coal (probably in other states, and importing the energy via the national grid) or natural gas (either in Victoria or elsewhere).

According to the Panel (Saunders, Angus and Evans 2005), the cost of generation from the alternatives would be higher than from Hazelwood - see Table 2. It is a simple matter to estimate the cost of emission reduction based from the Panel's data.

Table 1 Emission savings from replacing Hazelwood and generating the same amount of electricity using other means of fossil fuel generation over the period 2009-2031

	Mt CO ₂ -e emitted	Mt CO ₂ -e saved	% saving
Hazelwood- Business as Usual	340	NA	NA
‘Draft Deed Provisions’ (a)	315	25	7%
‘Strict conformance to existing policy’ (b)	285	55	16%
Black coal (generated in other States and imported)	207	133	39%
Integrated drying and gasifying combined cycle (IDGCC)(c)	181	157	47%
Open cycle natural gas turbine	118	122	66%
Combined cycle natural gas turbine	99	241	71%

Source: Derived from Saunders, Angus and Evans (2005) Table 27, p.180

a. Assuming reduction in the moisture content of brown coal used at Hazelwood

b. Hazelwood output partly replaced by generation from IDGCC plant using brown coal.

c. Total replacement by IDGCC, based on emissions data in Table.

IDGCC plant would reduce emissions at a cost of A\$ 4–13 per tonne CO₂-e, natural gas plant at \$11–19 per tonne, and wind at about \$ 24 per tonne (although it is difficult to envisage public acceptance of sufficient wind capacity to make this the sole substitution option, even if enough sites could be identified).

The Victorian Government would be hard put to argue against imposing emissions abatement costs such as these on the Victorian community by refusing Hazelwood’s extension of operation, because it has already mandated far less effective and far more expensive measures to reduce greenhouse gas emissions.

From July 2004 it has been mandatory for every new dwelling constructed in Victoria to have either a rainwater tank or a solar water heater. In areas where natural gas is available, the solar water heater must be boosted by natural gas, and where it is not available, the alternatives are boosting by electricity or LPG (with electricity almost certain to be the cheaper option).

Table 2 Cost of emission savings from replacing Hazelwood with other means of electricity generation

Technology	Fuel	t CO ₂ -e/MWh sent out		Estimate of \$/MWh sent out		\$/t CO ₂ -e saved	
		Sent out	Saving (c)	Low	High	Low	High
Conventional (Hazelwood)	Brown coal	1.54(b)	NA	25	25	NA	NA
Integrated drying and gasifying combined cycle	Brown coal	0.82	0.72	28	34	4	13
Combined cycle gas turbine	Natural gas	0.46	1.08	40	45	14	19
Conventional steam cycle (a)	Natural gas	0.60	0.94	35	40	11	16
Wind turbine	Renewable	NA	1.54	62	62	24	24

Source: Derived from Saunders, Angus and Evans (2005) Table 9, p. 51.

a. Authors' estimate

b. Saunders, Angus and Evans (2005) Table 26, p. 174 – 2002 'Baseline figure'

c. Saving compared with Hazelwood.

Table 3 illustrates the effective costs of saving CO₂ emissions by means of solar water heaters, taking into account the full life-cycle costs of the alternatives. In non-gas areas, mandating solar water heating reduces emissions at a cost of \$38-67 per tonne CO₂-e saved. In natural gas areas, the cost is \$275-475 per tonne CO₂-e, ie between 10 and 100 times as great as the supply side alternatives in Table 2.

Even though the costs of greenhouse gas reduction through closing Hazelwood are likely to be far lower than the costs of the measures already imposed on Victorians, there is a valid argument that they should not be borne by Victorians alone, since the objective of reducing emissions is supported by all Australian Governments, including the Commonwealth.

Table 3 Cost of emission savings from solar water heater requirements for new dwellings, mandated by the Victorian Government

Technology	Purchase(a)		Installation(b) \$	Energy cost \$/yr(a)	Total 10-yr cost		t CO ₂ -e emitted per yr(c)	t CO ₂ -e saved over life	\$/t CO ₂ -e saved	
	Low \$	High \$			High \$	Low \$			Low	High
Electric storage	800	1500	250	225	3300	4000	6.2			
Solar-electric	2500	4500	500	75	3750	5750	1.7	45.0	38	67
Gas (d)	800	1200	400	175	2950	3350	1.1			
Solar-gas	3000	5000	600	55	4150	6150	0.3	8.0	275	475

Source: (a) derived by author from SEAV (2002). RECs or Victorian government incentives not included, since these are simply transfer payments from other electricity users, not real cost reductions (b) Author estimate (c) Assuming greenhouse gas coefficients of 1.38 kg CO₂-e/kWh for electricity and 55 kg CO₂-e/GJ for natural gas. (d) High-efficiency storage or medium-efficiency instantaneous.

If the closure of Hazelwood leads to an increase in wholesale prices in the National Electricity Market, this would impact to some extent on all customers in the market. If this means of distributing the costs were considered insufficient, the recently announced intention of the States to develop State-based emissions trading should have as its first objective an equitable distribution of the costs of highly effective greenhouse gas reduction opportunities such as this one.

In its first paper on greenhouse, published a decade ago, the Australia Institute concluded that the first element in a 'moderate but effective national greenhouse strategy' was 'a commitment to build no further coal-fired power stations' (Wilkenfeld *et al.* 1995). This is still the touchstone of whether Australian Governments are serious about greenhouse gas reduction. It is a test facing other States as well, but the issue could hardly be as urgent or as sharply defined as it is for Victoria, which has the most greenhouse-intensive power stations in the country.

The Victorian Government's rhetoric has been exemplary. In the same month as the Hazelwood Panel made its report public, the Government released its *Victorian Greenhouse Strategy Action Plan Update* (DSE 2005), which states:

'A reduction in greenhouse gas emissions is already urgent, particularly at a time when energy demand and greenhouse gas emissions are increasing. The earlier that action is taken, the more orderly will be the transition to a low carbon future'

If the Government is serious about this, then it must act to prevent the extension of the operation of Hazelwood power station beyond 2009. Measures such as 'tree planting

offsets' or a 5% increase in the efficiency of Hazelwood would only be window-dressing, given the sheer magnitude of emissions at stake. Certainly, both carbon sinks and major improvements (far greater than 5%) in the efficiency of *all* fossil fuel power stations will be essential, but in addition to, not instead of, reductions in the greenhouse-intensity of electricity generation. Approving 340 million tonnes of emissions just makes the starting point all the more difficult.

If the Victorian Government is unwilling to act on an issue as clear-cut as this and with such obvious alternatives, then perhaps its most useful contribution to the greenhouse issue would be to refrain from publishing more strategies, and at least leave some more carbon standing in the forests.

References

- DSE (2005) *Victorian Greenhouse Strategy Action Plan Update*, Victorian Government Department of Sustainability and Environment, Melbourne, April
- NAEEEP (2005) *National Appliance and Equipment Energy Efficiency Program: When you keep measuring it, you know even more about it!* NAEEEP, April
- SEAV (2002) *Choosing a Hot Water System*, Sustainable Energy Authority of Victoria, April
- Saunders, R., Angus, G. and Evans, B. (2005) *Hazelwood West Field EES Latrobe Planning Scheme Amendment C32*, Final Panel Report, March
- Wilkenfeld, George, Hamilton, Clive and Saddler, Hugh (1995) *Australia's Greenhouse Strategy: Can the Future be Rescued*, The Australia Institute, Discussion Paper No 3, February