Greenhouse Pollution Intensity in the Victorian Brown Coal Power Industry

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Introduction

Electricity in Victoria is generated primarily by brown coal-fired power plants. While brown coal is an abundant resource, it is also highly polluting. Because of its reliance on brown coal, Victoria has the highest rate of greenhouse pollution in Australia, and indeed one of the highest rates of pollution in the world.

The power generation industry is increasingly under pressure because of this serious environmental impact, and most major generators have announced measures to improve efficiency and reduce pollution in recent years.

This report examines how successful those measures have been by comparing the emissions intensity between 1998-2004 of Victoria's five major brown coal-fired power plants – Anglesea, Hazelwood, Loy Yang A, Loy Yang B and Yallourn.

Key findings

- From 1998-2004, Hazelwood consistently operated with the highest emissions intensity of the top 5 Victorian brown coal fired power stations. Loy Yang A had the lowest emissions intensity.
- Hazelwood's emissions intensity trend was the worst over that time period, with a 2.7% *increase* in emissions intensity since 1998, despite $500 million spent on environment initiatives and plant improvements since 1996.
- Anglesea's emissions intensity trend was the best, with an improvement of 7.7% since 1998.
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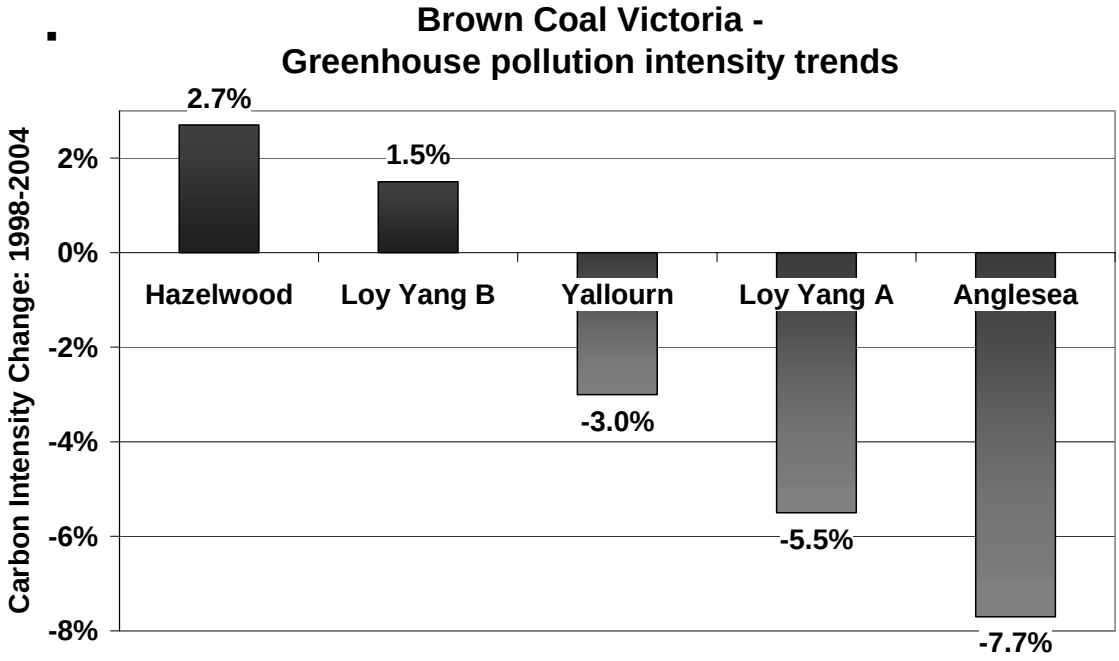


Emissions Intensity 1998-2004 for the five power stations

ACF and Environment Victoria collected data for emissions intensity for each of the five power stations from 1998-2004.

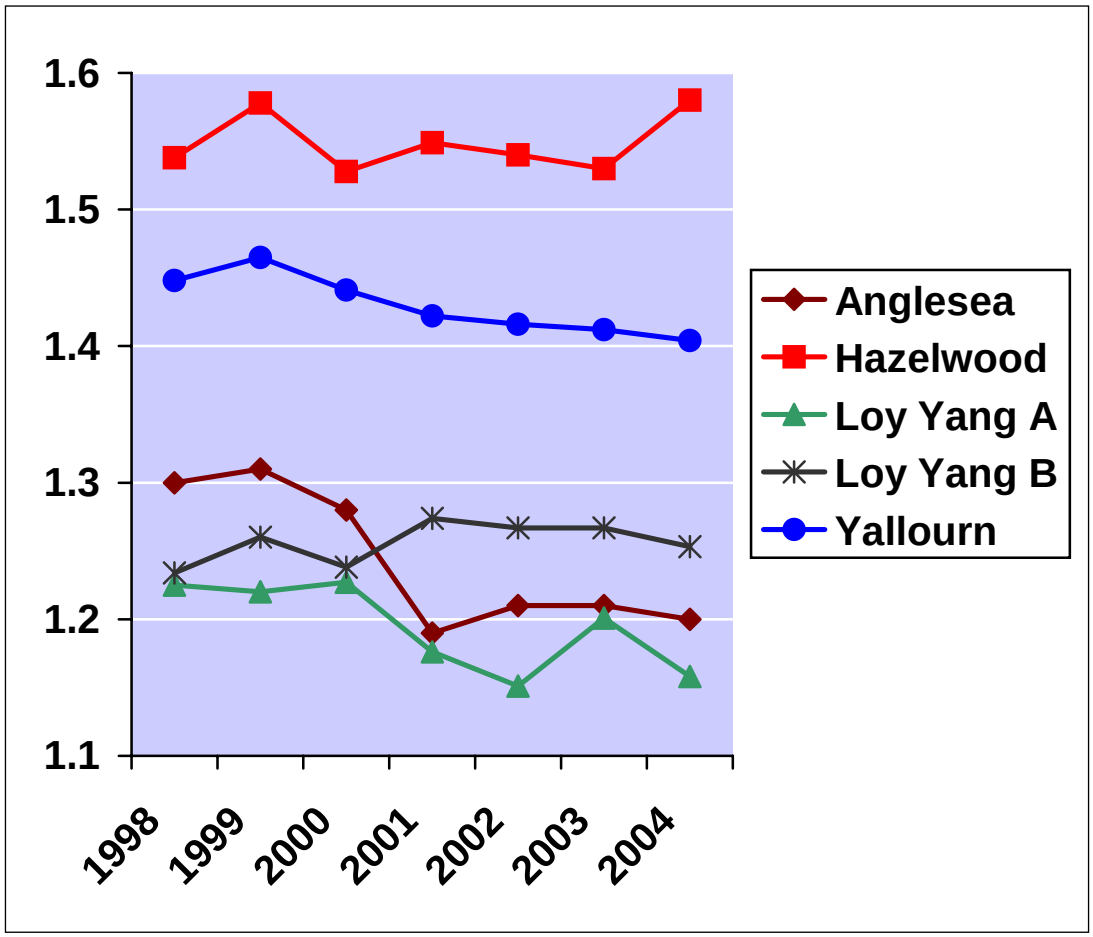
Emissions intensity is a measure of how much pollution is produced for each unit of electricity sent out from a power plant. It is the best measure to compare the relative performance of different facilities, taking into account the different generating capacity and electricity actually generated from different facilities.

Hazelwood, the oldest of Victoria's power stations, consistently maintained the highest emissions intensity for each of the seven years analysed. Loy Yang A achieved the lowest emissions intensity in all years studied.

Victoria's power stations:
greenhouse emissions intensity
(tonnes CO_2-e/MWh sent out)

	1998	1999	2000	2001	2002	2003	2004
Anglesea	1.30	1.31	1.28	1.19	1.21	1.21	1.20
Hazelwood	1.538	1.578	1.528	1.549	1.54	1.53	1.58
Loy Yang A	1.225	1.22	1.227	1.176	1.151	1.201	1.158
Loy Yang B	1.234	1.260	1.238	1.274	1.267	1.267	1.253
Yallourn	1.448	1.465	1.441	1.422	1.416	1.412	1.404

The below graph provides a clear picture of the differing pollution intensity of Victoria's generators, and their trends in reducing/increasing emissions.



Emissions intensity trends

The trends in emissions intensity of the five generators are detailed in the graph on page one. Our analysis for the time period 1998-2004 shows that:

- Three power stations have reduced their emissions intensity, whilst two have increased
- Hazelwood has had the largest increase in emissions intensity – 2.7%
- Anglesea has achieved the greatest improvement in emissions intensity – 7.7%
- Loy Yang A, the largest producer of electricity in the state, has achieved a 5.5% decrease in their emissions intensity

Brown Coal vs Other Fuels

The emissions intensity of Victorian brown coal generators should be kept in the perspective of efficiencies achievable by other fuel sources.

The below table shows that even Loy Yang Power, Victoria's most efficient power station, is more polluting then black coal, has more then double the emissions intensity of gas, around three times less efficient then co-generation, and nearly 60 times as polluting as wind. While some brown coal generators should be commended for reducing their emissions intensity while cleaner sources of energy are developed, the scale of this should always be balanced with the efficiency of other fuels.

Fuel Type	**Efficiency (tonnes CO_2-e/MWh sent out)**
Brown Coal (Hazelwood 2004)	1.58
Brown Coal (Yallourn 2004)	1.404
Brown Coal (Loy Yang A 2004)	1.158
Black Coal	.8 – 1.1
Gas	.4 – .55
Co-generation	.25 – .4
Wind	.02

Policy Implications: Hazelwood expansion

The Victorian State Government is currently deciding whether to:

(a) approve the West Field planning application by Hazelwood power station to allow access to coal within its existing mining licence; this will allow the station to run until 2026; and
(b) grant Hazelwood an additional 92 million tonnes (Mt) of coal, outside of their current mining license, which will let them run for an additional 5 years to 2031 and result in 90 Mt CO_2e of emissions.

In total, the project would result in an estimated 348 Mt of CO_2-e pollution, less any improvements Hazelwood is able to achieve. Hazelwood estimates they can achieve a reduction of 17 Mt of pollution; the Victorian Minister for Energy appears to be seeking a reduction of 25 Mt; whilst the recent EES Panel report observed that current Government policy would require at least a 55 Mt reduction.

Hazelwood's purported ability to achieve any of those reductions must be seen in the light of its decreasing greenhouse performance since 1998. Furthermore, the Government may wish to consider whether rewarding the worst-performing plant, in terms of greenhouse intensity and trends, with additional coal would constitute sound public policy.

Victoria has expressed a strong commitment to reducing greenhouse pollution in the coming years, and has accepted the need for deep cuts in such pollution if we are to do our part in averting catastrophic climate change. It is difficult to see how this can be accomplished if worsening emissions intensity levels at plants like Hazelwood are to be perpetuated and encouraged.

Policy Implications: New South Wales Greenhouse Gas Abatement Scheme

A 2003 analysis of the New South Wales Greenhouse Gas Abatement Scheme (NGAS) conducted by the University of New South Wales Centre for Energy and Environmental Markets revealed that Hazelwood "created" 251,119 Greenhouse Abatement Certificates (NGACs) in 2003, or 3.8% of the total for that year.

Once a NGAC has been created, it can be traded to New South Wales energy generators, which must accumulate a certain number of NGACs each year or pay a penalty. With spot prices for NGACs of around $11, the financial windfall to Hazelwood of its NGACs in 2003 would have been at least $2.5 million.

Hazelwood's NGACs were "created" through measures taken under the Generator Efficiency Standards. In theory, these measures should have resulted in some improvement in the plant's efficiency. However, as this report shows, during this period Hazelwood's emissions intensity was actually getting worse, and it was the worst performer in Victoria in this respect. Giving a power plant a $2.5 million financial windfall during a period in which its pollution intensity is increasing is perverse. The criteria for the grant of NGACs clearly need to be revisited to ensure that the program rewards real efficiency improvements, not declining performance.

Data Sources

Unlike in many other countries, Australia does not maintain a publicly available register of greenhouse gas pollution by major industrial facilities. Data for this report was collected from the generators themselves or from other sources using data from the industry, as follows:

Anglesea: March 2005 Anglesea Power Station Environment Report (data for all years)

Hazelwood: Final Panel Report, Hazelwood West Field EES / Latrobe Planning Scheme Amendment C32, Table 26 (data calculated by expert panel on the basis of information supplied by Hazelwood)

Loy Yang A: Data from 1998-2003 from Loy Yang Power's Greenhouse Challenge Report 1998 and Public Reports 1999-2003. For 2004, the source is a communication of 5 May 2005 from Loy Yang Power.

Loy Yang B: Data for all years communicated by IPM Loy Yang B on 6 May 2005.

Yallourn: Data for 1998-2000 calculated from emissions and generation data set out in CLP Holdings Social & Environmental Report for 2002. Data for 2001-2003 taken from Yallourn's 2003 SHEC Report. Data for 2004 calculated from emissions and generation data set out in CLP Group Social & Environmental Report.