



# Carbon Liabilities of NSW Electricity Generators

Research Paper No. 51

January 2008

Clive Hamilton<sup>1</sup>

---

The Iemma Government in NSW has announced that it plans to privatise the state's electricity generators and retailers. It intends to offer long-term leases to operate the generators to private companies.

In recommending the sale of electricity assets, the Owen Report noted that uncertainty about the liability new owners would have for the future carbon emissions of existing and new generators is impeding investment.<sup>2</sup> Plans by the Rudd Government to introduce a national emissions trading scheme, expected to start in 2010, will require all electricity generators and other emitters to acquire permits to cover their greenhouse gas emissions. This is expected to impose a substantial cost on fossil fuel-generated electricity and reduce the price advantage of coal over gas and renewable forms of generation.

In assessing the commercial viability of the NSW generators, any potential buyer will need to carefully assess the likely carbon liability for the life of the asset. Given the public demand for Australia to cut its emissions, and the signals from the Commonwealth that emission caps will be set with a view to cutting Australia's overall emissions by at least 60 per cent by 2050, the carbon penalty on coal-fired generators could be large, and will undoubtedly reduce their profitability. This should come as no surprise to the electricity sector, which only escaped measures of this type for the last decade because of the Howard Government's refusal to properly address climate change.

In view of the uncertainty associated with the carbon liability, and the expectation that it will be substantial, no prudent investor would buy the assets without addressing carbon risk. The most attractive solution from a buyer's viewpoint would be to get the NSW Government (i.e. the taxpayer) to indemnify it against the costs of future carbon liabilities, even before the details of the emissions trading scheme are worked out. In the past, governments have been known to give secret indemnities or subsidies to private companies to eliminate certain forms of commercial risk. These tend to no

---

<sup>1</sup> Thanks are due to George Wilkenfeld for supplying the data and Dr Hugh Saddler for his comments on a draft of this paper. The final paper is my responsibility alone.

<sup>2</sup> Professor Anthony Owen, *Inquiry into Electricity Supply in NSW*, NSW Government 2007.

longer remain secret once the costs of the indemnity are exposed, but by then it is too late. Last year, the NSW Government indemnified Bluescope Steel against carbon costs from its Port Kembla plant for the next 25 years.

It is well known that the NSW Treasurer and Minister for Infrastructure, Michael Costa, is a climate sceptic.<sup>3</sup> Mr Costa has responsibility for the privatisation of NSW electricity assets. Climate sceptics expect that the claims about the dangers of climate change due to excessive greenhouse gas emissions will prove unfounded or at least exaggerated, so that the need for Australia to reduce its greenhouse gases will be much less than expected. As a sceptic, Mr Costa may well believe that the price of an emission permit under the Commonwealth's emissions trading system will be lower, perhaps much lower, than the Commonwealth and most industry observers anticipate. In this case, the Treasurer would regard the granting of indemnities to private buyers of NSW electricity assets to impose only a small financial risk on NSW citizens.

But what would be the cost to NSW citizens of shifting onto their shoulders the obligation to pay for the carbon liabilities instead of the electricity generators?

It is not difficult to estimate the likely carbon liabilities associated with the seven NSW state-owned coal fired generators (Bayswater, Eraring, Mt Piper, Liddell, Munmorah, Vales Point and Wallerawang). Table 1 shows the expected greenhouse gas emissions (expressed in terms of carbon dioxide equivalent, CO<sub>2</sub>-e) emissions from 2009 through to 2030. It is expected that by 2030 only the Mt Piper generator will still be in operation as the others will have come to the end of their useful lives, unless they have been refurbished. Currently these generators account for about 11 per cent of Australia's total greenhouse gas emissions.

There is considerable uncertainty about the price of an emissions permit under the new trading system, because there is no history of demand for carbon emission permits of this type in Australia. How the scheme is designed and the stringency of the emissions cap will determine the scarcity of permits, and hence their price. However, the price of credits under other greenhouse programs gives some indication. In July 2007 Renewable Energy Certificates (RECs) created under the Commonwealth's Mandatory Renewable Energy Target were trading at \$31.30 per MWh (equivalent to about \$30 per tonne of CO<sub>2</sub>-e). NSW Greenhouse Abatement Certificates (NGACs) were trading at \$10 per tonne CO<sub>2</sub>-e, and European Union Emissions Permits at A\$34 per tonne.<sup>4</sup>

It is reasonable to expect that the price of an emission permit will be at least \$10 and probably closer to \$15/t CO<sub>2</sub>-e at the beginning of the scheme. The declining trajectory of any cap designed to meet a long-term target of 60 per cent reduction by 2050, will drive the price of permits up. Our best estimate is that the permit price will reach \$30 by 2020 and \$50 by 2030. These should be regarded as conservative estimates; the prices could be much higher. Using these permit price estimates (and interpolating for the years between), what is the expected carbon liability facing any owner of the seven power stations? Table 2 shows the liabilities for each year over

---

<sup>3</sup> See, for example, his comments in Parliament on 21<sup>st</sup> November 2006 <http://www.parliament.nsw.gov.au/Prod/Parliament/Hansart.nsf/V3Key/LC20061121019> and 6<sup>th</sup> June 2007: <http://www.parliament.nsw.gov.au/Prod/Parliament/HansArt.nsf/V3Key/LC20070606016>.

<sup>4</sup> *EcoGeneration*, September/October 2007, p41.

2009-2030 using these assumptions. It also shows scenarios with lower permit prices (\$10 in 2010, \$20 in 2020 and \$30 in 2030) and higher permit prices (\$20 in 2010, \$45 in 2020 and \$70 in 2030).

For our best estimate, the net present value of this stream, at a discount rate of 8 per cent, is \$15.38 billion dollars. This amount would be the cost borne by NSW citizens if the NSW Government indemnifies private buyers against future carbon liabilities. An indemnity would release the new owners of a very large cost and permit them to sell electricity more cheaply than otherwise. This would give NSW coal-fired generators a substantial competitive advantage over alternatives (gas and renewables) and over other coal-fired generators which would not receive this concession (or worse still, motivate them to lobby the Commonwealth for equal concessions on 'equity' grounds). In short, the granting of indemnities of this magnitude would cripple the Rudd Government's emissions trading system.

However it is considered, the imposition of a cost on carbon through an emissions trading scheme will sharply reduce the value of investments in coal-fired power plants. This, after all, is the intention of an emissions trading scheme – to improve the profitability of alternative methods of generating electricity. There have been suggestions in the press that the sale price of the generators and retailers will be in the order of \$15 billion. If this is so and our estimate of the cost of the carbon liability is anywhere near accurate, the carbon liability and indemnity issue will dominate negotiations in the sale process.

**Table 1 Estimates of maximum output and greenhouse gas emissions of seven existing NSW coal-fired power stations**

	<b>Generation</b>	<b>Emissions</b>
	<b>GWh p.a.</b>	<b>Mt CO<sub>2</sub>-e</b>
2009	77305	65.95
2010	78541	67.02
2011	79337	67.73
2012	79988	68.31
2013	80633	68.88
2014	81014	69.21
2015	80200	68.42
2016	80200	68.42
2017	80200	68.42
2018	80200	68.42
2019	67200	56.83
2020	67200	56.83
2021	67200	56.83
2022	67200	56.83
2023	67200	56.83
2024	58500	49.30
2025	58500	49.30
2026	52000	43.47
2027	52000	43.47
2028	52000	43.47
2029	52000	43.47
2030	10400	8.53

Source: Calculated by George Wilkenfeld from data appendix to *Inquiry into Electricity Supply in NSW*, A.D. Owen, September 2007, and other published sources.  
Notes: Output reduces as generator sets retire at end of useful life. It is assumed that any carbon price indemnity retires with current generators, irrespective of length of site leases.

**Table 2 Estimated carbon liabilities of NSW coal-fired power stations**

	Low estimate		Best estimate		High estimate	
	Assumed permit price \$/tonne	Carbon liability \$ billion	Assumed permit price \$/tonne	Carbon liability \$ billion	Assumed permit price \$/tonne	Carbon liability \$ billion
2009						
2010	10	0.67	15	1.01	20	1.34
2011	11	0.75	17	1.12	22.5	1.52
2012	12	0.82	18	1.23	25	1.71
2013	13	0.90	20	1.34	27.5	1.89
2014	14	0.97	21	1.45	30	2.08
2015	15	1.03	23	1.54	32.5	2.22
2016	16	1.09	24	1.64	35	2.39
2017	17	1.16	26	1.74	37.5	2.57
2018	18	1.23	27	1.85	40	2.74
2019	19	1.08	29	1.62	42.5	2.42
2020	20	1.14	30	1.70	45	2.56
2021	21	1.19	32	1.82	48	2.73
2022	22	1.25	34	1.93	51	2.90
2023	23	1.31	36	2.05	54	3.07
2024	24	1.18	38	1.87	57	2.81
2025	25	1.23	40	1.97	60	2.96
2026	26	1.13	42	1.83	63	2.74
2027	27	1.17	44	1.91	66	2.87
2028	28	1.22	46	2.00	69	3.00
2029	29	1.26	48	2.09	72	3.13
2030	30	0.26	50	0.43	75	0.64
Total		22.04		34.14		50.28
NPV at 8%		10.06		15.38		22.37