



NSW Greenhouse Gas Abatement Scheme 2003/04 update

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NSW Scheme: Presentation overview

- NGAS summary
- IPART 2003 and 2004 reports, little specific details on
 - projects
 - organisations
 - formal assessment of additionality
- We undertook a manual search of IPART NGAC database
- NGACs created 1st Jan 2003 to 30th June 2005
 - What activities?
 - Who created them?
 - Market power
 - Additionality



The NSW GHG Abatement Scheme

- Started in Jan 2003, underway for over 2.5 years
- Aims to reduce the per capita emissions for electricity sold in NSW
- Declining targets; from 8.65t/c in 2003 to 7.27t/c in 2007, 2012
- Liable parties are electricity retailers and some others
- NGACs used to audit compliance = imputed 1 tonne CO₂ avoided
- Can be created through low-emission generation, DSA and biosequestration
- LUACs created through on-site activities
- RECs can be converted directly into NGACs
- Penalty = \$10.50/t, up to \$11/t for 2005
- IPART released reports for 2003 and 2004 compliance periods
- Our analysis of the NGAC database for 2003 and 2004



NGACs created for 2003 and 2004

- NGACs: 6,662,976 (2003); 7,655,384 (2004)
(IPART 2004 Report 5,594,144 - up to 31st May 2005)
- Created through generation, DSA, biosequestration
- Surrendered: 1,167,392 (2003); 5,037,847 (2004)
- Created directly from RECs: 488,432 (2003); 762,122 (2004)
- No LUACs
- 93 accredited projects (17 DSA)

Projects for 2003 and 2004

	2003			2004		
	NGACs registered	% of total registered	Cumulative % total	NGACs registered	% of total registered	Cumulative % total
Waste Coal Mine gas	2,478,611	37.2	37.2	2,622,891	34.3	34.3
Landfill gas	1,979,899	29.7	66.9	2,217,889	29.0	63.2
Natural gas	1,117,472	16.8	83.7	1,130,974	14.8	78.0
Coal-fired plant	538,184	8.1	91.8	716,469	9.4	87.4
Energy efficiency - DSA	66,744	1.0	99.0	410,347	5.4	92.7
DSA - Generation	278,939	4.2	96.0	180,753	2.4	95.1
Biosequestration				166,005	2.2	97.3
Hydro	132,869	2.0	98.0	123,844	1.6	98.9
Sewage gas	59,381	0.9	99.9	58,928	0.8	99.6
Bagasse cogen	10,895	0.2	100.0	14,901	0.2	99.8
Food waste cogen				11,060	0.1	100.0
Coal Seam Methane				970	0.01	100.0
Pulp & paper cogen				353	0.01	100.0
Total	6,662,994 ^a	100	100	7,655,384 ^b	100	100

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Market concentration

	2003		2004		
	NGACs	% of total	NGACs	% of total NGACs	Cumulative %
Integral Energy	3,048,880	45.8	2,896,299	37.8	37.8
Energy Developments	1,122,260	16.8	1,151,896	15.0	52.9
AGL	542,625	8.6	765,929	10.0	62.9
EnergyAustralia	173,970	2.6	374,454	4.9	67.8
CS Energy	228,718	3.4	359,674	4.7	72.5
Country Energy	173,664	2.6	355,508	4.6	77.1
Macquarie Generation	63,362	0.95	199,124	2.6	79.7
Forestry Commission	0	0	166,005	2.2	81.9

- Five largest - 79% (2003), 72.5% (2004) of market
- Herfindahl-Hirschman Index = $s_1^2 + s_2^2 + s_3^2 + s_n^2$
- > 1,800 is highly concentrated
- NGAS HHI = 2,540 (2003), 1,862 (2004)

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Additionality assessment

- Abatement additionality
 - where projects result in reductions in emissions compared to before the Scheme's commencement date (when the initial per capita emissions level was set)
- BAU additionality
 - where the abatement activities would not have occurred in the scheme's absence (eg. due to demand growth, technology improvements)
- Policy additionality
 - where the abatement activities would not have occurred because of some other government policy

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Abatement additionality? - 1

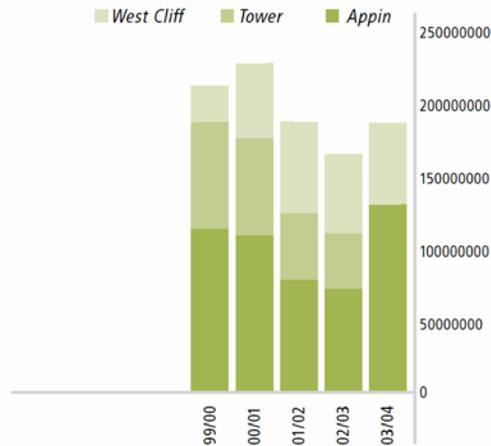
- **Category A fossil fuel plant (41.8% of 2003/04 total)**
 - Applies to Tower and Appin colliery waste coal mine gas plant (1996), Smithfield natural gas cogeneration plant (1997), Varnsdorf natural gas plant (~1994) and cogen plant in Melbourne hospitals.
- Given that all generation is eligible to create NGACs;
 - BAU additionality: To what degree did the existence of NGAS contribute to the decision to build the plant, and to their final design?
 - Abatement additionality: Has low emission generation from these plant increased since the Scheme started?
- If not, no abatement compared to before the Scheme

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Additional?

- Small increase since 2002
- 30% decrease since 1999
- Actual contribution is to increase emissions intensity of electricity sold in NSW

Figure 10: Mine methane used for power generation — cubic metres



Abatement additionality? - 2

- **Conversion of RECs into NGACs**
 - Policy additionality?
 - Made up just over 20% of NGACs used to meet liabilities for 2003/04
 - 2003: 544,518 RECs, 488,432 NGACs, 29.5%
 - 2004: 841,194 RECs, 762,122 NGACs, 13.2%
 - Projected to reach 2.5 million by 2010 ~ 10% of total
- About 250,000 NGACs could have been created in 2002
 - These are non-additional for 2003 and 2004 etc
 - Abatement hasn't happened compared to before scheme

Abatement additionality? - 3

- **Scheme's Pool Coefficient**
 - NGACs created depends on difference between EI and SPC
 - SPC average of the five previous year's Annual Pool Values, lagged by two years.
 - APV based on Cat B generators and interconnectors
 - APV is increasing, SPC is less than the current annual pool value
- This means;
 - Actual emissions are higher than stated
 - Are low emission generators offsetting more than are credited for?
- Also, assumes low emission plant offset Cat B, in fact they displace higher up dispatch order eg gas peaking which are lower emissions than Cat B

Abatement additionality? - 4

- **Transient abatement (36.7% of 2003 and 2004 NGACs)**
 - Renewable energy plant and Cat C fossil fuel plant
 - Don't 'pay back' their NGACs if they go below their baseline
- **Efficiency improvements under the GES (538,184 NGACs, 8.1% of 2003 total)**
 - Policy additionality?
 - To what degree did the NGAS contribute to improvement beyond GES requirements, or to turbine upgrades?
 - Applies to coal-fired power stations at Hazelwood (1964), Eraring (1984), Mt Piper (1992/93), Vales Point (1978/9), Wallerawang (1957/80) and Liddell (1973)
 - Ratcheting (next slide) - emissions intensity varies annually
 - Emissions increase but if baseline increases more, NGACs are created (slide after that)

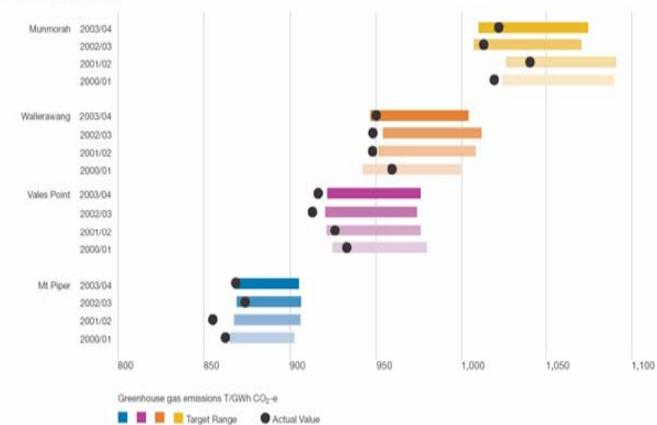
IP Hazelwood Env Report 2003 - Ratcheting

Annual Abatement from Power Station Improvement's in Emission Intensity ¹	Annual Abatement ² (t CO ₂ e/year) [#]	Accumulative Abatement (t CO ₂ e/year) [#]	Accumulative Abatement against a 1996 Base-line Year ³ (t CO ₂ e/year) [#]
Annual Abatement 1997	446,031	446,031	446,031
Annual Abatement 1998	758,473	1,204,504	1,281,414
Annual Abatement 1999	-439,556	764,948	913,455
Annual Abatement 2000	535,723	1,300,671	1,425,948
Annual Abatement 2001	-235,516	1,065,154	1,263,522
Annual Abatement 2002	100,416	1,165,570	1,337,370
Total Accumulative abatement	1,165,571	5,946,878	6,667,740

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Delta's Env Report 2003/04 - increased GHG create NGACs

FIGURE FIVE: GES PERFORMANCE



Greenhouse gas emissions T/GWh CO₂-e

■ ■ ■ Target Range ● Actual Value

Corrections to previously reported data:

- 2000/01 targets have been adjusted to 2005 target for consistency with other years
- Munmorah 2002/03 data corrected following coal stockpile survey

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IPART Compliance Reports

- 2003 Compliance report**
 - all liable parties met their NGAC obligations under the scheme for 2003, and so "have reduced their emissions to their Benchmark levels".
- 2004 Compliance report**
 - "With one exception, all electricity retailers and other benchmark participants reduced or offset their emissions through the surrender of abatement certificates to their benchmark levels or carried forward a small shortfall, within the permitted 10 per cent buffer".
- In fact, unless changes are made, overall per capita targets will not be met

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BAU additionality?

- Difficult to determine BAU additionality because it requires an assumption of what would have happened in the Scheme's absence
- Around 95% of the 2003 NGACs and 88% of the 2004 NGACs were generated by plant commissioned before the start of the Scheme.
- New facilities earning NGACs include coal-fired plant which began construction before the scheme started eg Millmerran and Tarong North began construction in 1999 and 2000.
- Likely that all fossil fuel plant built in future will earn NGACs because of improved technology and/or because they will be built to meet demand peaks.
- NGACs created via RECs for electricity sold in NSW reduce the NGAS's BAU and policy additionality
- Will the NSW Scheme increase the financial viability of low emission plant to the point where they are built in preference to high-emission plant?

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Policy additionality?

- **NGACs created directly from RECs**
 - Made up 29.5% of NGACs used to meet 2003 liabilities and 13.2% of 2004 liabilities
 - Although their percentage of the NGAS target decreases with time, their total each year increases as the MRET target increases, reaching about 2.5m by 2010 - maintained through to 2020
- **Greenhouse Gas Abatement program**
 - If receive GGAP funding after 1st Jan 2003, can create NGACs only in proportion to funding provided by generator. No such restriction prior to this.
 - GGAP funding covers what is not commercially viable for developer
 - Why does developer receive NGAC reward for doing what is already commercially viable?

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Biosequestration

- Biosequestration NGACs created for first time for 2004 (Forestry Commission of NSW), 2.17% of total
- Three other organisations are currently accredited for biosequestration
- Auditing requirements are rigorous but do not ensure additionality
- Questionable BAU additionality as can have been planted from 1990 onwards (possibly established in anticipation of reward for C sequestration?)
- Questionable abatement additionality
 - Project-based rules don't account for other activities of organisation that counteract sequestration eg. clearing of other areas since 'sequestering area' unavailable
 - Problem distinguishing projects from 'noise' due to limit of accuracy of LULUCF database
- Non-permanence an issue
 - Biomass carbon at continuous risk of being emitted to atmosphere
 - Kyoto uses temporary credits that are replaced with a different credit on expiry
 - NGAS requires maintenance for 100 yrs after which need not be renewed

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On the positive side

- Placed a price on GHG emissions, experience, capacity building
- Increased financial viability of existing low emission generators...
- Promotes DSA?
- Possibly changed BAU - made baseload gas-fired plant more viable eg. Wambo Power Ventures, 2 x120MW gas-fired power plant at Bega and Cobar.

"We are also assuming that the NSW Government's Greenhouse Gas Abatement Scheme will be extended beyond 2012, as this is an important element in having the project funded", Trevor St Baker, Managing Director, 26 Oct 2005.

But no commitment to build these yet

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Many of our publications are available at:

www.ceem.unsw.edu.au