Centre for Energy and Environmental Markets

Analysis of the NSW Greenhouse Gas Abatement Scheme

Sources of registered NGACs, market concentration, reporting transparency, additionality, economic efficiency, scenarios out to 2012, and possible policy implications.

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More information on this work is available at the CEEM website – www.ceem.unsw.edu.au.

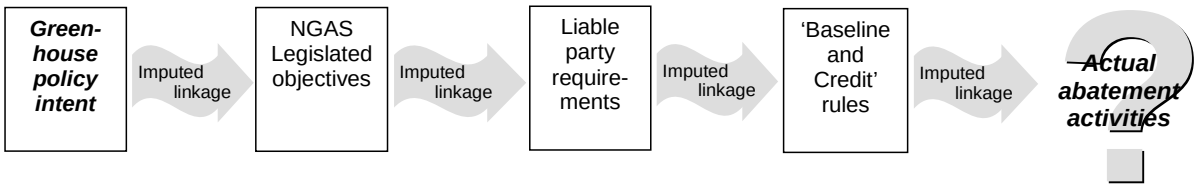
The NSW Greenhouse Gas Abatement Scheme (NGAS) has been underway for over two years. It aims to reduce the per-capita greenhouse gas emissions associated with electricity consumption in the State. NSW Greenhouse Gas Abatement Certificates (NGACs) are used to ensure compliance. During the scheme's original policy consultation process, observers including the authors raised concerns about the scheme's likely performance because of its complex design abstractions and likely low additionality.

A detailed analysis of the NGACs created for the 2003 compliance period, and scenario analysis exploring its possible future performance demonstrate that:

Reporting transparency is lacking: There is a lack of publicly available data on key aspects of the scheme's operation that makes it difficult to assess its performance. At the project level, it can be difficult to determine how a particular project created NGACs and the likelihood that the underlying emission reduction activity was additional. At the overall scheme level, there appears to be little information available on the scheme's actual effectiveness in driving abatement, the efficiency with which it achieves this and its potential equity impacts.

There is evidence of market concentration in the supply of, and demand for NGACs: There is a high level of market concentration. A single participant, Integral Energy, created almost half (46%) the 2003 NGACs, and together with EDL (17%) and AGL (8.5%), created over 70%. Furthermore, the three NSW government owned electricity retailers represent the majority of the NGAC liability. Markets with this level of concentration are at risk of manipulation by participants with market power.

Complex rules allow NSW electricity related emissions to increase even while retailers meet a declining state target: The complex 'imputed' linkages between the scheme's stated policy intent and the 'baseline and credit' rules mean that physical emissions from the NSW electricity sector can continue to increase even while the scheme's declining State per-capita target is met and large numbers of NGACs are created.



The scheme does not appear to have driven significant abatement to date: Over 95% of 2003 NGACs appear to have come from installations that were built or committed well prior to the commencement of the scheme. No operational changes were required by these pre-existing projects in response to the scheme's introduction in 2003 in order to create the great majority of these NGACs. Most of these activities, therefore, would not have reduced physical emissions from electricity sold in NSW.

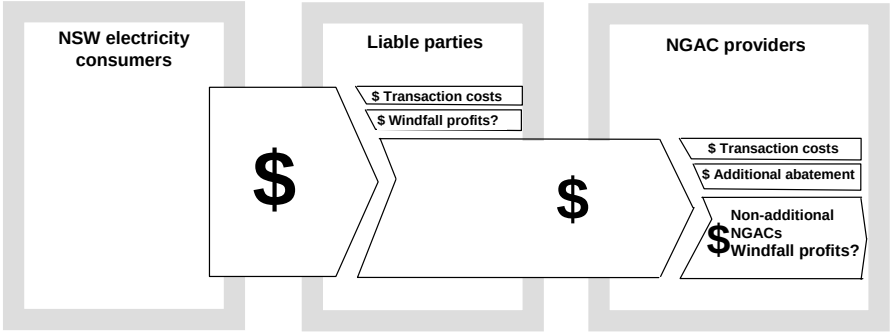
Additionality through to 2012 may be low: Through to 2012 additionality will be reduced by (i) non-additional NGACs from existing projects that continue over the life of the scheme, (ii) policy overlap between NGAS and other greenhouse related policy measures, and (iii) new generation in the NEM driven by BAU growth in electricity demand. Scenario analysis using conservative assumptions suggest that 70% or more of all NGACs created over the scheme's life may not represent additional abatement, and physical emissions can continue to climb.

Scenario options	NGACs (million)	Non-additional contrib. to NGAC demand (%)
IPART estimated total NGAC demand to 2012	**138**	
6 million non-additional NGACs/yr from existing projects	60	43%
6.6 million non-additional NGACs/yr from existing projects	66	48%
7.5 million non-additional NGACs/yr from existing projects	74	54%
Non-additional NGACs from policy overlap	35	26%
Non-additional NGACs from half this policy overlap	18	13%
Non-additional NGACs from 60% of BAU NEM generation	8	6%
Non-additional NGACs from 90% of BAU NEM generation	12	9%

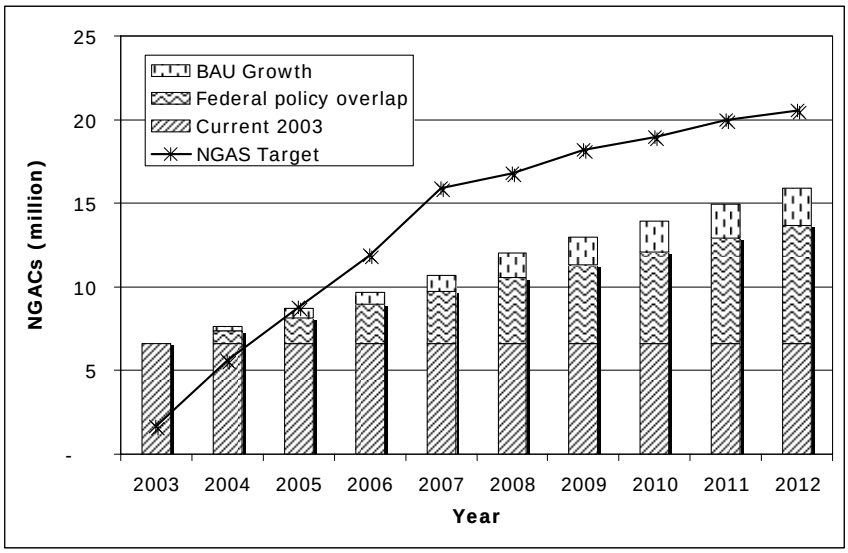
Scenario mix	½ policy overlap + 60% BAU plant	½ policy overlap + 90% BAU plant	policy overlap + 60% BAU plant	policy overlap + 90% BAU plant
6 million non-addnl NGACs from existing projects	62%	65%	75%	78%
6.6 million non-addnl NGACs from existing projects	67%	70%	79%	82%
7.5 million non-addnl NGACs from existing projects	72%	75%	85%	88%

Economic efficiency may be low while windfall profits are high: The cost of creating NGACs includes numerous transaction costs in accreditation, NGAC creation, auditing, registry fees and trading. These may be quite significant as IPART has rigorous auditing requirements, albeit requirements that don't necessarily test additionality. Relatively high transaction costs and low additionality suggest low economic efficiency for NGAS. There is also considerable potential for windfall profits for NGAC providers and/or retailers at the expense of NSW electricity customers. The equity impacts of this are significant. Further, just over 40% of the 2003 NGACs were awarded to projects outside NSW.

For example, if NGAC prices over the life of the scheme average $14 per NGAC, then electricity customers would pay around A$2 billion over the scheme's life to 2012. If transaction costs are responsible for 10% of the NGAC price that represents around A$190 million. If 80% of NGACs are non-additional that represents possible windfall profits of about A$1.4 billion for NGAC providers and/or retailers. Only around A$350 million would have been spent on additional abatement.



Extending the scheme's life to 2020 won't solve these problems: While extending the scheme's life would increase the NGAC requirement over time, we are also likely to see continuing growth in non-additional NGACS from overlap with new greenhouse policy measures (for example, the NSW Energy Savings Fund) and BAU capacity additions to the NEM.



Implications:

- The scheme currently appears to be driving little abatement
- Scenario analysis suggests the scheme may not drive significant abatement over its mandated life to 2012, or even if it were extended to 2020.
- It is clearly possible for physical emissions from the NSW electricity sector to continue to grow even while the scheme's per-capita emissions targets are achieved.
- This would have serious implications should a real price for greenhouse emissions emerge through future 'cap and trade' emissions trading schemes.
- There are likely to be significant wealth transfers from NSW electricity consumers to NGAC providers and retailers who are not actually undertaking additional 'abatement' activities, with a significant amount of this wealth leaving NSW.

Possible transition strategies:

- In our view, the present scheme design does not seem to offer any easy 'fixes'.
- Key design principles for transition to an effective scheme need to deal with
    - *abstraction* – measure scheme performance by physical outcomes,
    - *additionality* – avoid risks of baselines and grandfathering,
    - *market design* – achieve efficient price discovery and,
    - *scheme design & enhancement* – provide a transparent & peer-reviewed process.
- Possible replacements include a carbon tax or 'cap and trade' scheme with auctioning and no offsets
- Any scheme of this type will still require a coherent policy framework providing additional support for the development of a long term least-cost abatement portfolio including, for example:
    - a NSW gas generation scheme
    - renewable support such as State-based MRET
    - enhanced energy efficiency policy support

Operator	Project	NGACs	% of total	Cumulative
Integral Energy	Tower and Appin collieries	2,468,419	37.05%	37.05%
	Smithfield natural gas cogen	580,461	8.70%	
		3,048,880	45.76%	45.76%
Tower and Appin (1996[1]) and Smithfield (1997) are eligible to create NGACs from all generation.				
Energy Developments	Landfill gas	1,122,260	16.84%	62.60%
Seven landfill gas plant commissioned from 1992 to 1995 are Category A and are eligible to create NGACs for avoided methane emissions from generation above their REC or PPA-derived baseline. Three landfill gas plant commissioned from 1998 to 2002 are eligible to create NGACs for avoided methane emissions from all their generation,				
AGL	Landfill gas	493,545	7.41%	
	Sewage and natural gas	75,837	1.14%	
		569,382	8.55%	71.15%
Four 1995 landfill gas plant create NGACs in the same way as the equivalent Category A EDL plant. West Nowra (2002) creates NGACs in the same way as the equivalent Category D EDL plant.				
International Power	Natural gas	285,002	4.28%	75.43%
Pelican Point (2001) can create NGACs for net sent out generation above its average over 1997-01 if using the Relative Intensity rule.				
International Power Hazelwood	Coal-fired	251,199	3.77%	79.20%
Hazelwood (1964) created NGACs through actions taken under the GES.				
CS Energy	Natural gas	228,718	3.43%	82.63%
Swanbank E (2002) can create NGACs from all generation.				
Energy Australia	Landfill gas	160,449	2.41%	
	Hydro and DSA	13,521	0.2%	
		173,970	2.61%	85.24%
Lucas Heights (1995) and Belrose (1995) create NGACs in the same way as the equivalent Category A EDL plant. Glenbawn (1995) can create NGACs for generation above either the PPA-derived baseline, or if no PPA then from all generation.				
Country Energy	Tahmoor (DSA & Gen)	120,943	1.81%	
	Hydro & Biomass	52,721	0.79%	
		173,664	2.61%	87.85%
Tahmoor (2001) can create NGACs from all generation.. Three hydro plant from 1992 to 1996 can create NGACs for generation above their REC or PPA-derived baseline. Nymboida (1928) and Oaky (1950s) can create NGACs for generation above either the PPA-derived baseline, or if no PPA then from all generation.				
TXU	Landfill gas	109,839	1.65%	
	Hydro	42,821	0.64%	
		152,660	2.29%	90.14%
Berwick (1992) can create NGACs in the same way as the equivalent Category A EDL plant above. Three hydro plant from 1994 can create NGACs from generation above their REC or PPA-derived baseline. Three hydro plant from 1989 to 1993 can create NGACs from generation above either the PPA-derived baseline, or if there is no PPA then from all generation.				
Eraring Energy	Coal-fired	129,086	1.94%	92.08%
Eraring (1984) created NGACs through actions taken under the GES.				
Visy Pulp & Paper	Biomass cogeneration	113,489	1.70%	93.78%
Tumut (2001) created NGACs under the DSA Rule most likely under the Generation Emissions Method.				
Delta Electricity	Coal-fired	94,537	1.42%	95.20%
Mt Piper (1992/93), Vales Point (1978/9) and Wallerawang (1957/80) created NGACs through actions taken under the GES.				