



An assessment of NGAS performance to date, scenarios of its possible performance to 2012, and their policy implications

Iain MacGill

Workshop on the NSW Greenhouse Gas Scheme

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NGAS performance assessment

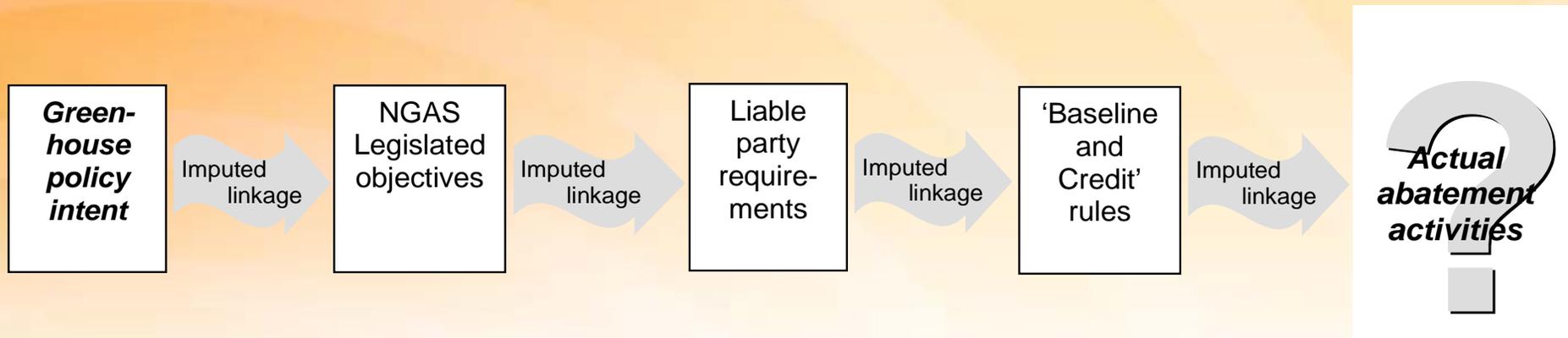
- Assess performance with respect to
 - *Effectiveness* in reducing greenhouse emissions
 - *Efficiency* with which it achieves this
 - *Fairness* in its potential impacts on NSW electricity customers

- Analysis focuses on design challenges
 - *Abstractions* between policy objectives and operation in practice
 - *Additionality*: delivery of abatement that would not have happened without NGAS
 - *Market trading*: how does the NGAC market appear to be performing

NGAS Abstractions

- Complex ‘imputed’ linkages between:
 - *policy intent* of reducing emissions created through NSW electricity consumption
 - climate responds to physical emissions, and these need to be reduced
 - eg. Kyoto Protocol sets physical caps on developed country emissions,
 - *legislated objectives* to “reduce emissions associated with production + use of electricity, + to encourage participation in activities to offset the production of emissions.”
 - based on estimated emissions from consumption, not physical emissions from generation.
 - credit for non-electricity related activities including sequestration
 - credit for interstate activities – indirect impacts on emissions, no multi-jurisdictional legal framework
 - liable parties are retailers who don’t create emissions, not NSW generators who do
 - *requirement that liable parties* “...meet mandatory targets for reducing the emission from the production of the electricity they supply or use.” and calculation of NGACs target
 - calculated from declining per-capita target, state electricity demand, ‘imputed’ pool coefficient etc: not intuitive or accurate, particularly with wrt pool coefficient, and NGAC calculations
 - ‘Emissions reductions’ an estimate of how emissions reduced from what otherwise happens
 - *‘Baseline and credit’ assessment of abatement:*
 - complex rules for eligibility + amount of abatement projects can claim

Impact of these design abstractions



- Some reasons why NGAS may have been designed with these imputed linkages
 - eg, State Government jurisdiction of NSW retailer licenses.
- Unfortunately, means physical electricity generation emissions in NSW can continue to climb even while NGAS declining State per-capita target is met



NSW energy retailers reduce greenhouse gas emissions

9/2/05:

NSW energy retailers have reduced greenhouse gas pollution by more than eight million tonnes since 2003, the economic regulator said on Tuesday.

This has been done through an increased use of renewable energy, improved generator efficiency and avoiding methane emissions under pollution targets set by the NSW Greenhouse Gas Emissions Abatement Scheme.

The Independent Pricing and Regulatory Tribunal (IPART), which regulates the scheme, said NSW operated one of the world's leading greenhouse gas emission trading schemes.

"The NSW Greenhouse Gas Abatement Scheme was introduced in 2003. In the first 20 months, more than eight million tonnes of emission reductions were registered," IPART CEO James Cox said in a statement.

"The NSW scheme demonstrates that carbon trading is viable and businesses can benefit from participating in the scheme."

Cox's comments follow Tuesday's conference on the trading scheme, which aims to reduce greenhouse gases by making industries pay for the cost of their pollution.

Under the mandatory scheme, NSW electricity retailers, including AGL, Integral and EnergyAustralia, are limited on their pollution output, with annual reduction targets in place until 2012.

Companies can trade units of pollution: if a business reduces emissions, they can sell units or "certificates", but if the company increases pollution they must buy units to off-set the emissions attributable to their company.



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Considerable potential for confusion

NGAS additionality

- Additionality problematic with ‘baseline and credit’ since counterfactual **However**, essential because if don’t actually change behavior, why implement?
- Key tests in assessing additionality:
 - Did project commence before scheme?
 - If yes, has scheme materially changed operating decisions from what otherwise would have been, and reduced emissions?
 - If project implemented after scheme, would it have happened regardless (BAU)?
 - If yes, materially changed operating decisions...?
 - Is project investment or operation being driven by other government programs?
 - If yes, how much of emission reductions can be attributed to your scheme?
- Additionality can be extremely difficult to calculate
 - Rejected for EU ETS and proposed National / multi-state Australian ETS
 - B+C schemes like CDM focus on investment, rigorous + transparent tests of additionality
- NGAS doesn’t *explicitly* discuss or attempt to assess additionality at all
 - avoids potential difficulties of actually making assessment
 - However, means performance of the scheme isn’t formally assessed



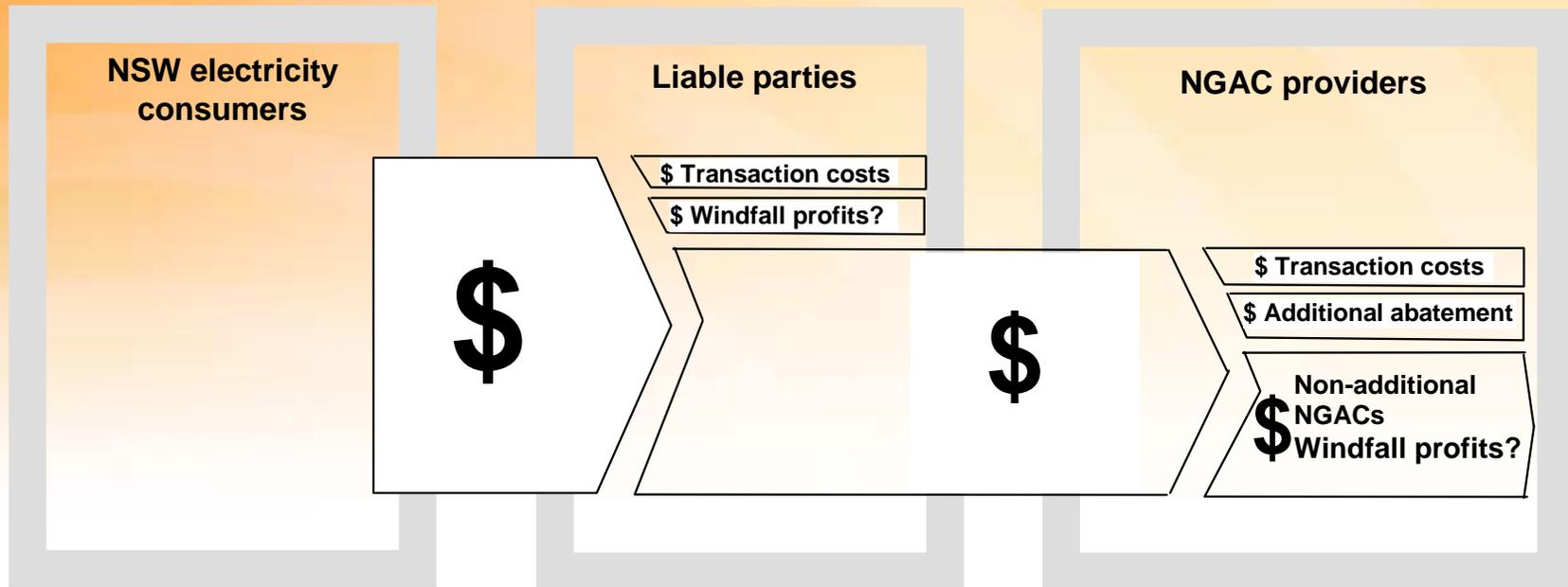
Additionality questions for NGAS

- Limited public data makes additionality of 2003 NGACs particularly difficult to assess
- However,
 - More than 95% came from projects built + operating well before 2003
 - Great majority of these projects were not required to make operational changes in order to earn NGACs

NGAS financial impacts

- NGAC costs
 - Costs of any additional action, if required
 - Transaction costs
 - IPART has rigorous accreditation, however many audits may ensure compliance with rules that don't require additionality
- NGAC prices
 - Generally commercial-in-confidence
 - Liable party transaction costs
- NGAC price pass through
 - Small customers on regulated tariffs have IPART price determination
 - Negotiation may be possible for negotiated contracts
 - Large customers may become direct participants, some may meet obligations with LUACs

Possible money flows through NGAS



- **Additionality and transaction costs matter, for example if:**
 - End users pay present spot price for all 2003 NGACS = A\$70 million
 - If transaction costs 10% of price = A\$7 million
 - If 10% of NGACs additional, abatement (investment + operational) = A\$7 million
 - Remaining A\$59 million represents windfall profits to NGAC creators and/or retailers.

Assessing future NGAS performance

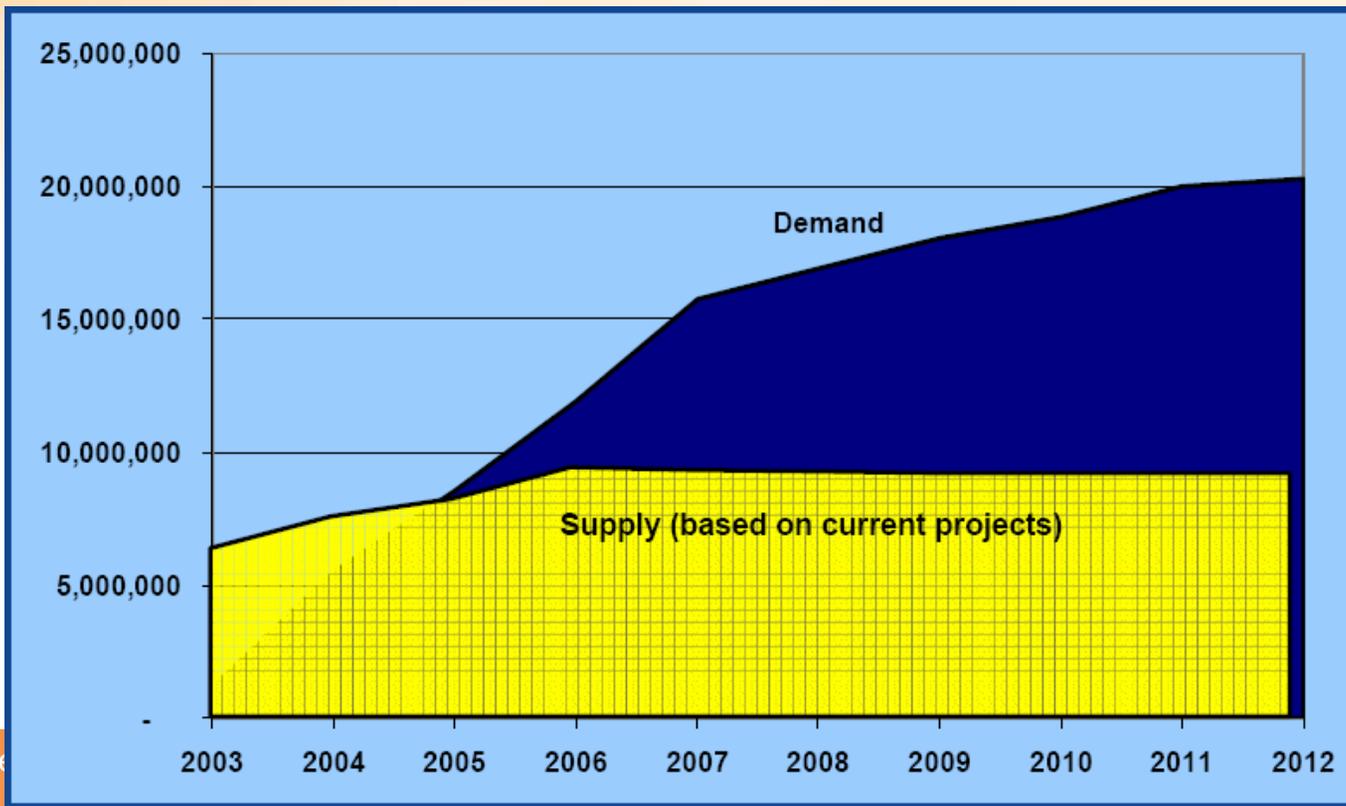
- Key assessment for NGAS is performance over legislated life to 2012
 - good reasons to ramp up highly novel policy measures to allow participants to build up capacity

- However, “Prediction is very difficult, especially about the future.”
Niels Bohr

- We use scenario analysis to manage uncertainties
 - projected NGAC demand
 - the additional abatement delivered by existing projects
 - impact of other greenhouse policy measures on scheme performance
 - other BAU developments in the NEM that might also impact

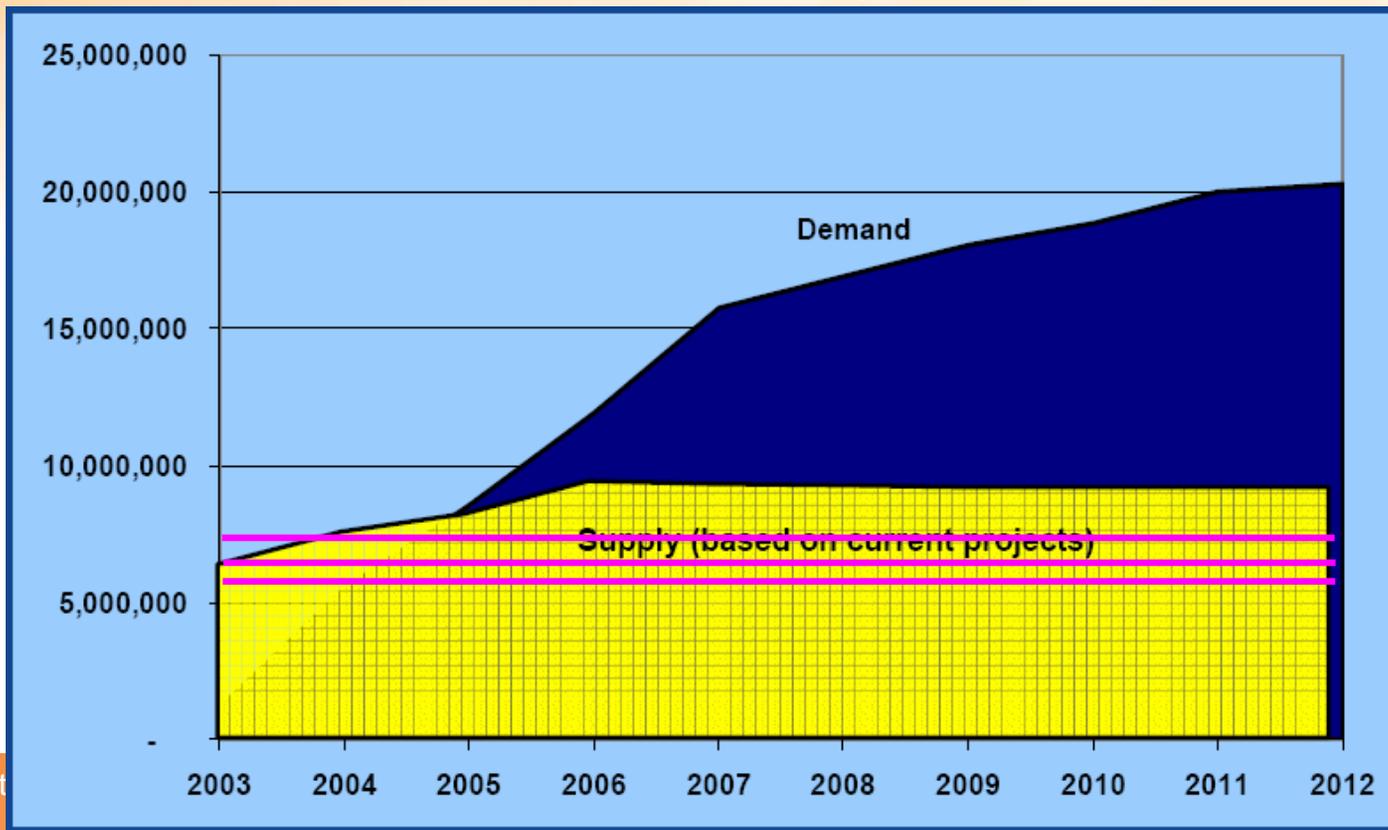
NGAC demand

- Use IPART's demand scenario for NGACs to 2012
 - IPART notes that only a very basic model is used to generate curve, and that “You should rely on your own judgement about future demand for NGACs.”
 - No detailed information on how this estimate was made.
- *Scenario*
 - *Approx 140 million NGACs required over the life of the scheme.*



NGACs from existing projects

- *3 scenarios for NGAC supply from current projects:*
 - *6 million non-additional NGACs a year to 2012*
 - *6.6 million non-additional NGACs a year*
 - *7.5 million non-additional NGACs a year from 2004 onwards*



NGACs from BAU growth in NEM demand

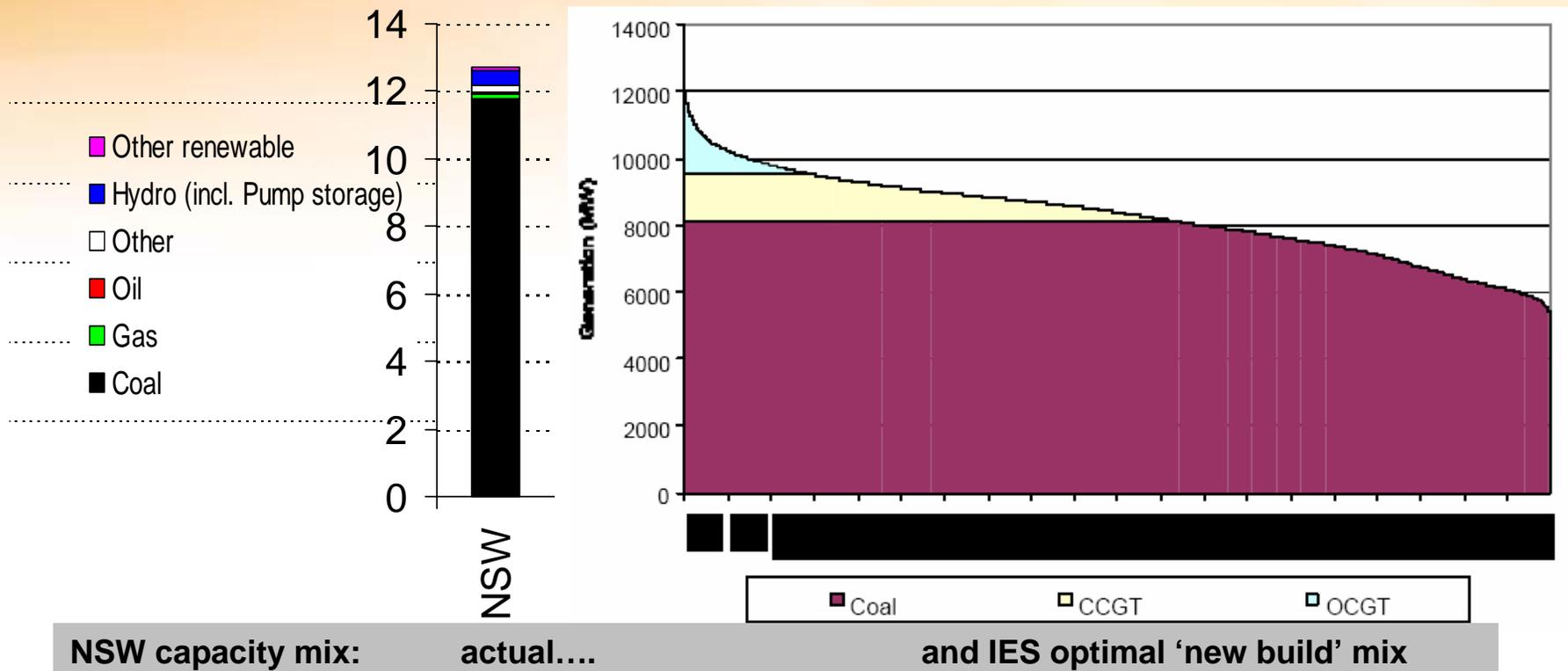
- BAU growth in NEM demand expected to require construction of new plant before 2012
- Nearly all this plant likely to be able to create NGACs
 - intensity of coal-fired plant lower than pool coefficient b/c better technology over the last 20 years.
 - intensity of intermediate and peaking plant lower again as generally gas-fired units.
- Impact of NGAS on investment + operation of existing plant hard to estimate, may be low
 - Only a short NGAS revenue horizon for new investment
 - Income from NGACs at present prices may not significantly change merit order
 - Growth in NEM demand is likely to be a far more important driver than NGAS
 - *NSW Audit Office “.. NGAS allows for retailers purchasing interstate generated ‘low emission’ electricity from gas or lower emission coal to have credit, even when such generators may have been established in a business as usual context without regard for emissions reduction.”*
- *For our scenarios*
 - no new coal plants other than Kogan Creek on line before 2012 – might earn 1-2m NGACs to 2012
 - use ABARE estimates of increased gas generation to 2012, use State split estimates to remove Qld, assume mix of 90% intermediate and 10% peaking plant, use emm intensities for older plant mix
 - **NGACs that might come from additional generation beyond 2003 = approx 13 million to 2012.**
- *2 scenarios:*
 - 90% of the 13 million or so NGACs that might come from new NEM coal + gas not driven by NGAS
 - 60% of these NGACs non-additional wrt NGAS

Challenges in predicting BAU within NEM

Example: one estimate of optimal ‘new build’ plant mix for NSW in 2003

(IES 2004 report to IPART)

- IPART noted this ‘optimal’ plant mix has enough CCGT to meet NGAS targets without any retailer requirement to purchase NGACs (IPART Pricing Determination 2004-7)
- Actual generation mix tells another story (ESAA, 2004)



Scenarios, and their possible non-additionality

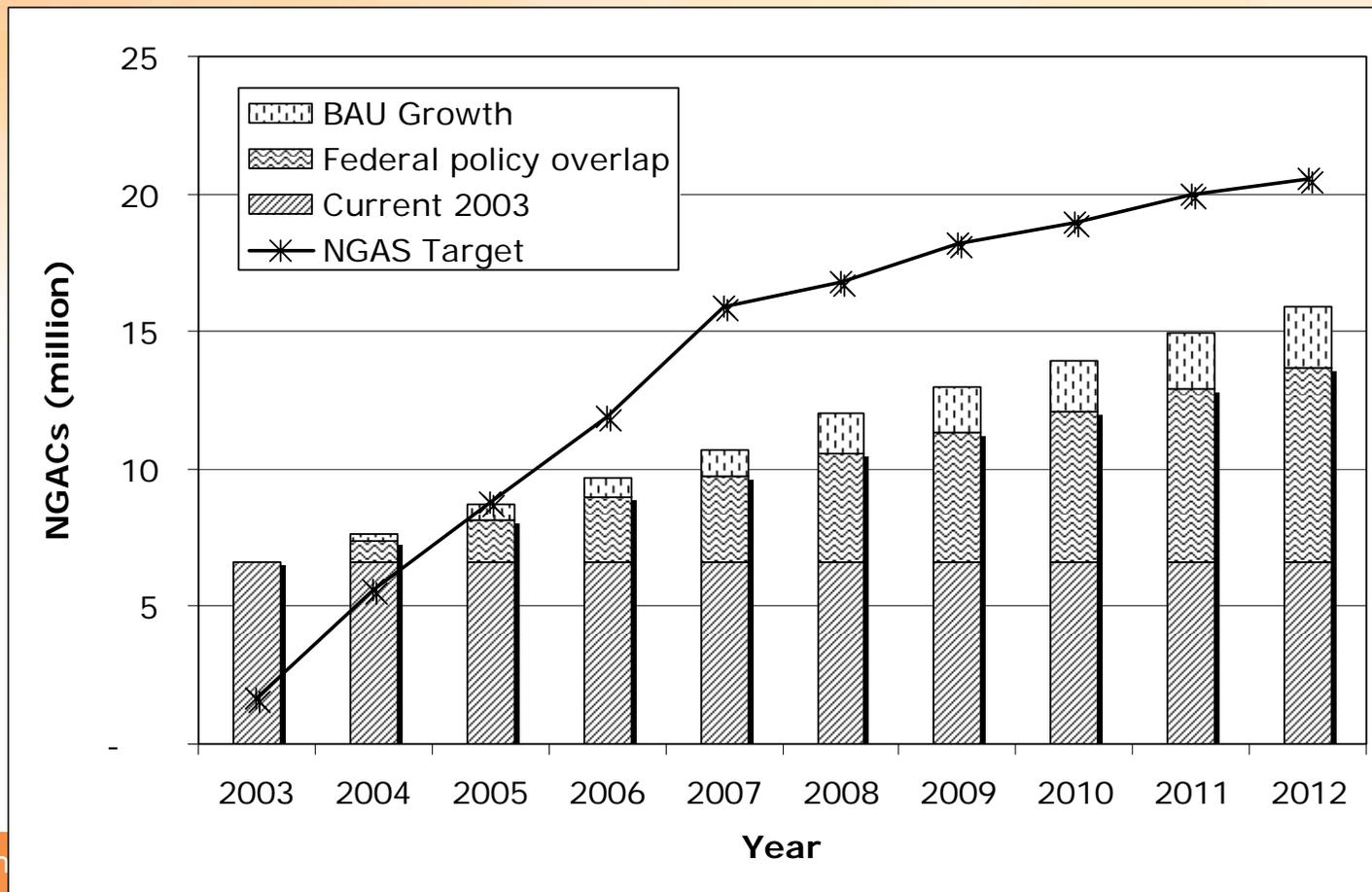
Scenario options	NGACs (million)	Non-additional contrib. to NGAC demand (%)
IPART estimated total NGAC demand	138	
6 million non-additional NGACs/year from existing projects	60	43%
6.6 million non-additional NGACs/year from existing projects	66	48%
7.5 million non-additional NGACs/year from existing 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 mixes + their possible non-additionality

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- additional NGACs from existing projects	62%	65%	75%	78%
6.6 million non- additional NGACs from existing projects	67%	70%	79%	82%
7.5 million non- additional NGACs from existing projects	72%	75%	85%	88%

One scenario of future NGAS performance

- 6.6 million non-additional NGACs / year from current projects, policy overlap and non-additional BAU generation growth in the NEM
=> 80% non-additional NGACs over the life of the scheme



Some thoughts for the future of NGAS

- Extending NGAS to 2020 (as raised in NSW Energy Directions paper)
 - Continuing efforts to strengthen energy-related climate change policy
 - eg, recently announced NSW Demand Management fund projected to reduce emissions by 800,000 tCO₂-e /year by 2011 (DEUS, 2005). Will earn NGACs?
 - BAU development of the NEM
 - Considerable gas plant projected to enter NEM post 2012 period (MMA, 2004)

- may still result in relatively low levels of additionality
 - physical increases in emissions from the NSW generation sector
 - considerable wealth transfer to NGAC providers, and perhaps retailers
 - **For example**, if average price for NGACs is A\$14 then electricity customers pay approx A\$2 billion over the life of the scheme.
 - If transaction costs are responsible for 10% of NGAC price = A\$190 million.
 - If 80% of NGACs are non-additional = A\$350 million on additional abatement
 - Possible windfall profits to NGAC providers and/or retailers = A\$1.4 billion



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