IPART
New South Wales

Independent Pricing and Regulatory Tribunal

# NSW Greenhouse Reduction Scheme

## Strengths, weaknesses and lessons learned

**Greenhouse Gas Reduction Scheme**
July 2013

GGAS
Greenhouse Gas
Reduction Scheme

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The Tribunal delegated its functions as Scheme Administrator and Compliance Regulator under the *Electricity Supply Act 1995* to a GGAS Committee comprising:

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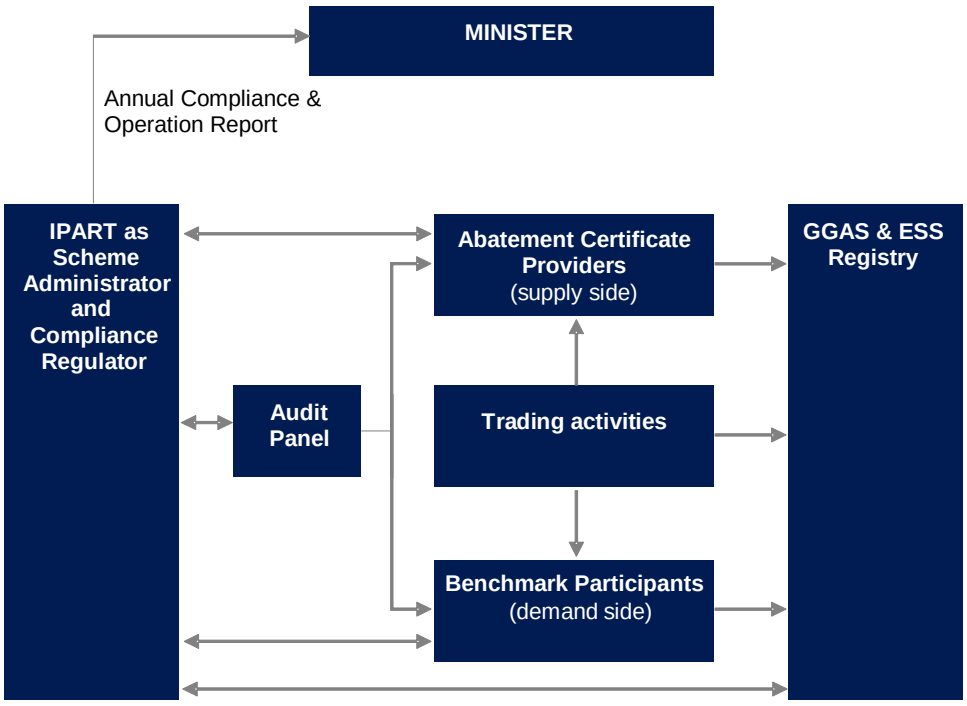
# 1 Executive summary

When the New South Wales Greenhouse Gas Reduction Scheme (GGAS)[1] commenced on 1 January 2003, it was the first mandatory greenhouse gas emissions trading scheme for the electricity sector in the world. When the scheme closed on 30 June 2012, most participants were well-placed to transition to Australia's national carbon pricing mechanism, which commenced on 1 July 2012.

Throughout its lifetime, the Independent Pricing and Regulatory Tribunal of NSW (IPART) acted as both the scheme's administrator and compliance regulator. We monitored compliance by both liable parties and certificate creators, and reported annually to the Minister on the performance of the scheme. This is illustrated in the diagram below:

**Figure 1.1 Operational framework for GGAS**




With the closure of GGAS, we consider it good practice to provide an exit report: to objectively assess the strengths and weaknesses of GGAS, and to distil the lessons learned from the operation and administration of the scheme and their policy implications.

1 GGAS was originally called the Greenhouse Gas Abatement Scheme, but the name was changed in early 2007 to make it more readily understood that its purpose was to reduce greenhouse gas emissions.

GGAS stimulated a wide range of accredited abatement projects which created over 144 million abatement certificates, representing a similar number of tonnes of carbon dioxide equivalent (tCO2e) greenhouse gas abatement.

## 1.1 Strengths and weaknesses of GGAS

As GGAS was a pioneer emissions trading scheme, its overall achievement was to demonstrate that a market-based mechanism could achieve environmental objectives at a relatively low cost to consumers and government by providing financial incentives to businesses participating in the scheme.

From a policy perspective, its main strengths were in the design of the market based mechanism and in the pilot testing that preceded the legislative changes that implemented the scheme.

From an implementation perspective, its main strengths were that it:

- encouraged the lowest cost, most efficient means of abatement
- achieved a high level of compliance, primarily by establishing an effective audit framework and encouraging a culture of compliance
- kept administration and compliance costs low
- established an effective and easy to use registry, which facilitated the registration, transfer and surrender of certificates
- made significant improvements to methodologies for measuring and verifying emission reductions.

However, GGAS also had some weaknesses. For example, the inclusion of legacy generation at the start of the scheme proved to be quite generous. On the other hand it also placed restrictions on the certificates created by Large Energy Users that unnecessarily constrained the potential supply of low-cost abatement from reductions in industrial process emissions. In addition, it used a rising emissions intensity baseline (the 'NSW pool coefficient') which moderated the effect on greenhouse gas emissions. Further, the scheme was unduly influenced by accepting certificates (Renewable Energy Certificates) from an unrelated scheme.

While attracting minimum criticism from participants, the scheme's design attracted criticism from academics and others who favoured an approach that involved measuring the absolute reductions in emissions reductions achieved, rather than the hypothecation approach used by GGAS. In particular, it was criticised for its treatment of financial additionality.

## 1.2 Lessons learned from GGAS implementation and administration

The GGAS experience provides a number of lessons about the design and operation of a market-based scheme to deliver positive environmental outcomes. In particular, it highlights the importance of:

- setting achievable but challenging targets and providing a transparent mechanism for adjusting them over time
- establishing penalties and shortfall allowances as a means of ensuring compliance and managing risks of potential supply shortfalls
- providing sufficient flexibility in the design so that unforeseen issues can be addressed
- minimising the risks and uncertainties inherent in regulatory markets and facilitating market development
- establishing market confidence in abatement certificates and their value as a tradeable commodity
- establishing a strong regulatory regime that ensures the integrity of the scheme
- limiting the ability to surrender certificates from unrelated schemes.

GGAS also provides some lessons about the implementation and administration of such schemes, as well as implications for policy delivery in general. These include the value of engaging and consulting with stakeholders, providing transparent information and a user-friendly certificate registry, and focusing on keeping the costs of participation as low as possible.

## 1.3 Structure of this report

The rest of this report discusses GGAS and its lessons in more detail:

- Sections 2 and 3 assess its main strengths and weaknesses.
- Section 4 draws out the lessons learned from the implementation and administration of GGAS, and the implications for the delivery of good policy.
- Appendix A provides a brief description of the national and NSW electricity market. Appendix B provides a brief overview of the scheme, its objectives, key design elements and the rationale for selecting those elements. Appendices C and D provide comments from a range of stakeholders, commentators and participants on their experience with and perspective on the scheme.

This report is separate to GGAS's annual compliance reports. For a complete explanation of the scheme, this report should be read in conjunction with the annual reports, which include data on certificate creation by each accredited project. All GGAS annual reports are available from www.ipart.nsw.gov.au

# 2 Strengths of GGAS

GGAS was a pioneer emissions trading scheme. As such, its primary achievement was to demonstrate that a market-based mechanism could be used to achieve environmental objectives at a relatively low cost to consumers and government. It provided financial incentives to businesses participating in the scheme, and provided first-hand experience to those and other businesses of participation in an emissions trading scheme.

GGAS operated effectively and performed well over its lifetime. It stimulated a wide range of accredited abatement projects. Together, these projects created 144 million abatement certificates (NGACs and LUACs), representing a similar number of tCO2e of greenhouse gas abatement.[2]

## 2.1 Market based design

From a policy perspective, GGAS's paramount strength was in its market-based design. That design was based on the well understood economic principle of supply and demand, where there was a product and readily identifiable sellers and buyers. While the product was a virtual product (rather than a physical product), once the nature of the product was understood (a credit for a reduction from a baseline of emissions), businesses were able to rapidly embrace its application. The label 'base line and credit' was coined to convey the unique nature of the virtual product. As businesses readily embraced this market mechanism, they were able to focus their attention on the underlying methods for meeting the requirements of the Rules that governed its operation. This meant that the Scheme Administrator was able to engage businesses willingly into adopting new methods for managing the virtual product (such as the PITR and the MEUM, see section 2.6).

An equally important strength was that it followed from the experiences of a pilot scheme. Prior to the design of the GGAS, licence conditions had been imposed on retail market participants which allowed many of the underlying concepts to be developed and tested. The licence conditions imposed a voluntary self-administration regime on these entities, resulting in outcomes that contributed to the design of the legislation. The ultimate legislative package

[2] It is not possible to precisely measure the amount of tCO2e abated because of projects that were grandfathered into the scheme and deeming which allowed abatement to be claimed in advance.

provided the Scheme Administrator with clear objectives, a sound governance framework, precise rules and instructions, yet provided sufficient flexibility for good practice to be sought out and implemented, particularly in response to identified loopholes that required a fast regulatory response.

From an implementation perspective, its main strengths were that it:

- encouraged the lowest cost, most efficient means of abatement
- achieved a high level of compliance, primarily by establishing an effective audit framework and encouraging a culture of compliance
- kept administration and compliance costs low
- established an effective and easy to use registry, which facilitated the registration, transfer and surrender of certificates
- made significant improvements to methodologies for measuring and verifying emission reductions.

## 2.2 Cost and efficiency of abatement

GGAS encouraged the lowest cost, most efficient means of abatement. The scheme was designed to be technology and resource neutral. That is, it did not favour one technology or fuel source over another – it left the market to identify abatement projects which encouraged the lowest cost, most efficient means of abatement. As a result, GGAS led to a wide range of abatement projects and activities, including:

- the building of new low-emissions-intensive generation plant, the greater use of existing low-emissions power plant, and efficiency improvements to existing power stations
- the building of smaller generation and cogeneration plant fuelled by waste methane from landfill, sewerage and putrescible waste
- the capture and combustion of waste coal mine gas, to convert it from methane (which has a high global warming potential) to carbon dioxide (which has a much lower global warming potential) before venting it to the atmosphere
- improvements in fuel efficiency and production processes at large industrial sites, including the replacement of high-emissions-intensive fuels with lower emissions-intensive fuels
- tree planting and maintenance projects on farming land.

GGAS also led to a large number of small-scale energy efficiency programs, such as replacing inefficient technologies and appliances in households and commercial buildings with new, higher efficiency versions. This was partly due to the 'deeming' provisions in the scheme,[3] which lowered the transaction costs of these relatively small individual energy efficiency measures.

The proliferation of these programs under GGAS demonstrated that it was possible to include offsets for energy efficiency in an emissions trading scheme. It also increased public awareness of energy efficiency, and led to greater take up of energy efficient appliances.

## 2.3 Level of compliance

The level of compliance achieved by both GGAS benchmark participants and abatement certificate providers was very high. For example, over the life of the scheme, only 3 of the scheme's 43 benchmark participants paid penalties for non-compliance. These penalties represented a very small proportion – less than 1% of the total numbers of certificates participants were required to surrender over this time.[4]

In addition, the vast majority of certificates registered by abatement certificate providers (96.7%) were verified through audits as having been created in accordance with the GGAS Rules. 1.1% was found to have been invalidly created.[5]

Further, almost all incidents of non-compliance identified by audits were successfully resolved. Where they involved the invalid creation of certificates, the abatement certificate providers were requested to voluntarily forfeit the number of improperly created certificates.

This high level of compliance was primarily achieved by establishing a strong and effective audit framework, and encouraging a culture of compliance.

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3 The Demand Side Abatement Rule specified default abatement factors for Eligible activities. These factors represented a conservative estimate of the emission reductions from using an energy efficient product over its lifetime compared to a standard product.

4 The total number of certificates surrendered (including voluntary surrenders) under both NSW and ACT schemes was 133,517,731 (as at January 2013). The total value of the penalties paid for failing to surrender sufficient certificates to meet individual benchmarks was $84,839, which is equivalent to around 6,207 certificates (and tCO2e).

5 These data were derived from the annual compliance reports published by IPART on its website for years 2003 - 2012. 2.2% of all certificates created in GGAS were not verified through audits.

### 2.3.1 Audit framework

The audit framework was the principal means of managing compliance risk under the scheme. The key characteristics of this framework were its panel of accredited auditors, the risk-based audit regime, tripartite agreements for engaging auditors, and clear guidance for conducting the audits.

#### Panel of accredited auditors

IPART required that all GGAS audits be conducted by third-party auditors with expertise in greenhouse auditing. To facilitate this, it established a GGAS Audit Services Panel, and provided mandatory training to those that wished to become appointed to the panel. IPART also established a Technical Services Panel to provide technical advice to it and to abatement certificate providers.

These panels not only provided a source of independent advice and low-cost compliance under GGAS. They also built capacity and skills in this field of auditing, which facilitated the implementation of later carbon reduction policies, such as national greenhouse and energy reporting scheme (NGERS) and the carbon pricing mechanism.

#### Risk-based audit regime

Both benchmark participants and abatement certificate providers were subject to audits. All benchmark participants were required to submit annual compliance statements (annual Greenhouse Gas Benchmark Statements) to IPART, which identified their electricity sales in NSW (in MWh) and their attributable emissions. They were also required to have these statements audited by a member of the Audit Services Panel prior to submission, to provide assurance that the statements were accurate and complete.

Abatement certificate providers were subject to a more flexible, risk-based audit regime. Their audit frequency was determined by their level of risk. To identify this risk, IPART considered factors such as the nature of the project, its scale and complexity, the provider's previous compliance performance, and the extent to which the provider was already participating in the scheme.

Projects creating large volumes of certificates were usually subject to annual or biennial audits. However, audits could also be triggered when a threshold of certificates had been created and registered. In some cases, where the level of identified risk was very high to extreme, audits were required prior to certificate registration.

Projects creating small numbers of certificates were usually subject to spot audits. Under a spot audit regime, IPART could require an audit at any time. Certificate providers understood that it was intended that this right would be exercised only if there were concerns about the project and certificate creation. In practice spot audits were rarely commissioned.

In all cases, the auditor looked at the adequacy of record-keeping arrangements, metering, and certificate creation calculations. Additional items were included in the scope of works determined by the level of identified risk for the project.

### Tripartite agreements for engaging auditors

All GGAS participants were required to engage auditors under a tripartite agreement between the auditor, the participant (who paid for the audit) and IPART (as the primary client). This novel approach enabled IPART to closely monitor each participant's compliance.

The participants usually selected and directly engaged the auditor (from the Audit Services Panel), subject to IPART's approval of both the auditor and its detailed scope of works. However, in some cases where an abatement certificate provider had a high level of identified risk, IPART directly engaged the auditor following a competitive quotation process. In general, auditors were rotated after 3 audits of the same participant unless there were exceptional circumstances.

### Guidance on the conduct of audits

Even though the tripartite agreements ensured that IPART could monitor audits, the audit framework still relied heavily on the quality of audits and auditors. Therefore, in addition to providing training to the Audit Services Panel members (discussed above), IPART provided considerable guidance on the conduct of audits, including templates for audit scopes and standard formats for audit reports.

It also required that parties to the tripartite agreements be involved in all stages of the audit. For example, audits generally included an initial meeting between all parties to discuss the scope and conduct of the audit, as well as a close-out meeting prior to a final audit report being issued, to ensure any remedial action required was well understood by all parties.

### 2.3.2 Culture of compliance

The legislation provided IPART as Scheme Administrator and Compliance Regulator with wide-ranging compliance enforcement powers. For example, it could suspend or cancel accreditations. It could prosecute for an offence under the Act which could lead to payment of significant penalties. However, IPART was never required to use these powers over the life of the scheme. Instead, it fostered a culture of voluntary compliance and cooperation.

In addition to the audit regime discussed above, IPART developed transparent procedures and strategies intended to encourage and facilitate voluntary compliance by abatement certificate providers. These included:

- **Procedures for assessing applications for accreditation,** which placed strong emphasis on the applicant's capacity and capability to comply with the requirements of the scheme. For example, they aimed to reveal any errors or inconsistencies in the application, and assist the applicant to strengthen its systems and procedures. This encouraged a culture of voluntary compliance and helped minimise non-compliance events after accreditation was granted.
- **The Compliance and Performance Monitoring Strategy** for abatement certificate providers, which aimed to:
  - provide transparency in the administration of the scheme
  - assist participants to understand their obligations
  - minimise the incidence of invalid creation of abatement certificates
  - provide cost-effective compliance options, and
  - provide for credible enforcement options in the event of non-compliance.
- **Annual reports on compliance and operation of GGAS** to the Minister for Energy, which were subsequently tabled in the NSW parliament, thereby providing a public account of the performance of GGAS for each year.[6] In addition to reporting on compliance by benchmark participants, any incidences of non-compliance by abatement certificate providers were also included.

## 2.4 Costs of administration and compliance

GGAS was administered with minimal bureaucracy which kept overall administration and compliance costs low. For most of its lifetime, it was overseen by a team equivalent to around 9 full-time professional staff, supported by panels of accredited auditors and technical experts, and an external contract to operate the registry. This was a relatively small team, given the size of the

6 All GGAS annual reports are available from www.ipart.nsw.gov.au.

scheme,[7] and kept the costs of administering the scheme low. The costs of complying with the scheme were also relatively low.

### 2.4.1 Cost of administration

We estimate the cost of administering GGAS over its 10-year lifetime to be around $18 million. This estimate includes salaries, wages and associated on-costs of staff, as well as general administrative costs from use of contractors, consultants, office accommodation and consumables. It represents a cost of $0.125 per certificate created under GGAS. These costs were recovered through fees charged for the registration of each certificate, as well as the accreditation application fees.

### 2.4.2 Cost of abatement

The cost of abatement under GGAS is difficult to estimate accurately, as it requires analysis of the costs of the various projects undertaken to generate certificates and the additionality of greenhouse gas reductions.[8] However, the Grattan Institute estimated that the scheme achieved a cost of around $15 to $40 per tonne of CO2e reduction.[9] The same analysis found that this cost was lower than the cost of abatement under other comparable Australian schemes, including the national Renewable Energy Target scheme.

### 2.4.3 Cost impact on electricity prices

GGAS's cost impact on NSW electricity prices was also relatively low. Our analysis suggests that the average increase in the delivered cost of electricity as a result of the scheme was between $1.20 and $2.40 per MWh.[10] This increase is modest in the context of a total delivered cost in excess of $100 per MWh. It is also in line with the forecast increase in cost of $1-$2 per MWh based on economic modelling undertaken during the scheme's design phase.

Overall, GGAS was implemented with only a modest impact on the NSW economy, and there is no evidence that GGAS influenced businesses to locate outside NSW.

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7 During GGAS's lifetime, IPART administered 43 benchmark participants, 145 abatement certificate providers and 348 accreditations.

8 Additionality refers to the extent that emission reductions went beyond those which would have been achieved in the absence of the scheme.

9 Daley, J & Edis, T., *Learning the hard way: Australia's policies to reduce emissions,* 2011, Grattan Institute.

10 IPART unpublished data, March 2013.

## 2.5 GGAS Registry

The GGAS registry was designed to be effective and easy to use. The registry is an online database accessible to all GGAS participants and the general public to manage the registration, transfer and surrender of certificates. It enabled benchmark participants to purchase and surrender NGACs to meet their mandatory obligations under GGAS. Members of the public could also purchase and surrender NGACs for their own purposes. In this way, the GGAS registry provides a means for voluntary carbon offsets. However, the registry was not a platform for trading certificates. IPART judged it better to leave the market to satisfy this requirement.

### 2.5.1 Design and operation

The design and operation of the GGAS registry was outsourced via tender. The successful tenderer (Logica CMG) designed the registry in consultation with IPART, and was contracted to operate and maintain it.[11] This meant that IPART did not need to maintain all the necessary skills and expertise to service the database over time. However, it also involved ongoing maintenance costs and commissioning Logica CMG to carry out any modifications to the registry design.

### 2.5.2 Functionality and ease of use

The GGAS registry was functional and easy to use. For example, it allowed the creation of certificates in bundles (rather than using an inventory system). This meant that bundles of certificates (say 5,000) could be registered in one operation, which required less data entry, fewer pieces of stored data, and a shorter processing time. If the bundle was split for transfer or surrender, the registration entry was split accordingly.

The registry design also allowed for IPART staff to set up the account for each abatement certificate provider. This account included details of the limits placed on that provider's certificate creation,[12] as well as other basic information that uniquely identified that abatement certificate provider. Once this account was established, there was little need for further support through the registry help desk.

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11 The original contract with Logica was for 5 years. This was subsequently extended for a further 2 years, with 3 one-year options (to deal with the uncertainty about the future of GGAS). The current `contract expires in September 2013.

12 The inclusion of certificate creation limits in a provider's Registry account limited the risk of invalid creation of certificates.

Over the life of GGAS, there were usually less than 20 calls per month to the help desk, and often these were related to the scheme more generally. In addition, registry users expressed a high level of satisfaction with the usability of the registry and responsiveness of the help desk.[13]

### 2.5.3 Cost of the GGAS registry

Over the life of GGAS, the total cost of the GGAS registry was around $4 million. This included initial design, monthly maintenance fees, help desk services and necessary upgrades (eg, to include the ACT scheme, incorporate the Energy Savings Scheme, and enhance functionality).

## 2.6 Measurement and verification of carbon emissions reductions

During the life of GGAS, IPART developed 2 new methodologies to improve the measurement of emissions abatement from coal-fired generation and landfill gas generation. These methodologies enabled more accurate means of estimating emissions for accredited GGAS electricity generators. They also facilitated reporting for NGERS and the carbon pricing mechanism. IPART also undertook significant work to enable carbon sequestration projects to be included in emissions trading schemes.

### 2.6.1 Performance Improvement Testing Regime

The Generation Rule included 3 methods by which existing fossil-fuelled generators within the NEM could create NGACs. These methods were based on the Australian Government's Generator Efficiency Standards (GES) and were supported by technical and program guidelines. However, as the GES was negotiated with the generators as a voluntary measure, there was little focus on robust measurement of efficiency.

To address this issue and safeguard the integrity of GGAS, IPART developed the Performance Improvement Testing Regime (PITR), and made it a mandatory requirement for certificate providers accredited claiming under Method 2 of the Generation Rule from mid-2006. The PITR established a robust methodology for comparing the original performance of a generating system to its performance after an efficiency improvement had been made. It also required generators to assess the level of certainty of the predicted performance improvements. While applying the PITR was an inherently complex process, it greatly improved the accuracy of measuring greenhouse gas emissions (and emission reductions) from base-load coal-fired generators.

[13] Logica, GGAS and ESS Registry User Survey 2012: report to IPART, unpublished.

### 2.6.2 Methane Energy Uncertainty Methodology

The Generation Rule also provided incentives for generation and cogeneration plants fuelled by waste methane (landfill gas, waste coal mine gas, sewage gas). To provide a more accurate measure of greenhouse gas emissions, IPART developed the Methane Energy Uncertainty Methodology (MEUM) in 2009. This method encouraged companies creating NGACs through methane-fuelled generation plant to:

- install specialist measuring equipment to monitor the methane content of waste gases, rather than use the conservative default setting in the Generation Rule (which was based on average generation efficiency of 30%, subsequently amended to 36% in December 2005), and
- use a calibration regime that ensured that the measuring equipment operated within defined uncertainty limits.

This not only improved the integrity of GGAS, it also potentially enabled those companies to create additional NGACs because of the more accurate estimates provided via the MEUM. As a result, the methodology was universally adopted. It was also recognised as a ground-breaking approach that more accurately measured the energy content of waste gas from landfills.

### 2.6.3 Approaches for measuring carbon sequestration

IPART undertook pioneering work to enable the inclusion of carbon sequestration projects in emissions trading schemes. This included developing a rigorous approach for providing for restrictions on the use of the land to ensure the sequestered carbon is maintained for 100 years.

# 3 Weaknesses of GGAS

GGAS also had some weaknesses, including the level and expression of its targets, its use of the NSW pool coefficient as the emissions intensity baseline, and the restrictions it placed on Large User Abatement Certificates (LUACs). It had a weakness in allowing Renewable Energy Certificates (RECs) to be used for compliance in the scheme. In addition, the scheme's design attracted criticism from academics and others who favoured an approach that involved measuring absolute emissions reductions. In particular, it was criticised for its treatment of financial additionality.

## 3.1 Level and expression of the targets

GGAS's legislated abatement targets (benchmarks) increased in each of the first 4 years of its life. However, they remained at the 2007 level until the scheme's end-date in 2012. They also remained at the 2007 level when this end-date was extended to 2021.[14] These targets could have been strengthened, with appropriate re-setting of penalty levels to encourage continued compliance. The early years of GGAS had demonstrated that abatement could be achieved at relatively low cost.

In addition, the way the benchmarks were expressed – as tCO2e per capita – made the calculation of benchmark participants' individual obligations to surrender abatement certificates complex. The compliance equations and the variables involved made it difficult for these participants to forecast their future compliance obligations with an acceptable level of certainty. A simpler calculation method would have been to multiply the benchmark participant's electricity purchases by an 'abatement certificate factor'.

## 3.2 The use of the NSW pool coefficient as the emissions intensity baseline

GGAS used the NSW pool coefficient (see Appendix B.3.2) as the emissions intensity baseline for calculating the number of certificates that could be created from low-emission generation and improvements to the emissions intensity of existing generation. This meant that the higher the NSW pool coefficient, the greater the number of certificates that could be created by the same eligible project over time, all other things being equal.

[14] This was largely because the scheme's extension was intended to be an interim measure, primarily to provide some level of investment certainty and alleviate the fears of stranded investments, until a national emissions trading scheme was established.

As the NSW pool coefficient rose in each year of GGAS's operation,[15] some generators were able to create an increasing number of certificates without further reducing their overall emissions. This was neither consistent with long-term greenhouse gas reduction policies, nor with the intent of emissions trading to provide incentives to reduce emissions. A better approach would have been to use a fixed or declining emission intensity baseline, such as average coal-fired base load plant in NSW or nationally at a particular date.

## 3.3 Restrictions on LUACs

LUACs were non-tradable abatement certificates that could only be created from reductions of industrial process emissions by Large Energy Users with annual electricity consumption in excess of 100 GWh. These limitations almost certainly restricted the opportunities for low-cost abatement under GGAS from these sources. Lifting the restrictions would most likely have been advantageous and reduced the cost of meeting a particular greenhouse gas reduction target. For example, the transport industry may have found GGAS attractive and acted to reduce its emissions.

## 3.4 Treatment of additionality

GGAS did not require that accredited projects demonstrate financial additionality (that is, that they would not have occurred without GGAS). Rather, its guiding principles were that accredited projects should be:

- environmentally additional – that the project reduced or offset greenhouse gas emissions from the NSW electricity sector, and
- legislatively additional – that the project exceeded any statutory requirements under other legislative or other mandatory requirements in NSW.[16]

It was decided not to apply a strict test to demonstrate financial additionality, as the experience of the Clean Development Mechanism of the Kyoto Protocol[17] indicated this could significantly delay the project approval process. It was considered preferable to facilitate GGAS by taking a reasonable approach to additionality, rather than have it unduly hindered by evidentiary requirements.

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15 Because electricity consumption continued to grow and existing hydroelectric generation fell as a proportion of energy supply to NSW.

16 For example, planning provisions for new office buildings in Sydney required a minimum of a 4 star energy rating. Accordingly, certificates could only be created where that requirement was exceeded.

17 CDMs or Clean Development Mechanisms were introduced in 2000 as a flexibility mechanism under the Kyoto Protocol, but only became of significant interest after the European Union Emissions Trading Scheme commenced on 1 January 2005, and the Kyoto Protocol came into force in February 2005.

Nevertheless, the GGAS design has been criticised for this treatment of additionality. In a paper published in mid-2007, researchers from the University of NSW's Centre for Energy and Environmental Markets (CEEM) expressed concerns that GGAS had not achieved a high level of technical or policy additionality.[18] That is, they questioned whether GGAS projects reduced global emissions compared to what they would otherwise have been. For example, CEEM argued that credit should not have been given:

- where technological progress occurred
- where low-emission generation such as open cycle gas plant was installed to meet peak demand, not environmental outcomes, and
- for projects (such as Category A generation) that pre-dated GGAS.

In terms of policy additionality, CEEM questioned the level of abatement that had occurred as a result of other (including national) policy initiatives.

Some of these criticisms are valid. Indeed, several changes were made to GGAS after this paper was published that addressed some of the criticisms. For example, Category A generation projects were excluded from the scheme from 1 July 2010. This meant that projects that pre-dated GGAS could only create abatement certificates when performing above a non-zero production baseline that reflected their output prior to GGAS.

However, overall GGAS projects have reduced global emissions compared to what they would otherwise have been. For example, although the Australian Government implemented the Generator Efficiency Standards, GGAS provided a further (financial) incentive for generators to improve the energy efficiency of their operation. In addition, while GGAS may not have been the prime driver in having open cycle gas turbines installed to meet peak demand, NGAC revenue was considered when calculating new entry costs and the long run marginal costs for both combined cycle gas turbines and open cycle gas turbines.[19] GGAS also provided an incentive for low-emission-intensity generators to produce more than they would otherwise have done by reducing their marginal costs of generation.

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18 R Passey, I MacGill, H Outhred, Centre for Energy and Environmental Markets, University of NSW (August 2007), *The NSW Greenhouse Gas Reduction Scheme: An Analysis of the NGAC Registry for the 2003, 2004 and 2005 Compliance Periods*.

19 Intelligent Energy Systems (1 December 2009), *Review of Wholesale Energy Price for the Period 2010 – 2013*, Draft Report.

In the preparation of this report, we sought the views of businesses that participated in GGAS. We asked them to comment on their experience, and to cite any benefits or criticisms they had as a result of participating in the scheme. These views are presented in full in Appendices C and D. However, we note that Michael Lebbon from LMS Energy commented that *"The overwhelming majority of LMS' generation projects were built because of GGAS"*. We also note that carbon sequestration from forests had never occurred prior to GGAS, and that James Bulinski from the CO2 Group commented that *"GGAS was a major factor in CO2 Group Ltd's decision to develop a business around carbon project development and to explore a range of opportunities in the emerging carbon economy."*

## 3.5 Allowing the surrender of RECs

The Renewable Energy Target (RET Scheme) commenced as a national scheme in 2001 through the Renewable Energy legislation. In designing the GGAS legislation, discussions were held with the Commonwealth Government, with the outcome of allowing a proportion of RECs to be recognised (in their equivalent value) as a replacement for surrendering NGACs. The aim of this policy position was to ease the compliance burden on NSW electricity retailers (and their customers). Consequently, these participants were permitted to count a limited number of the RECs they would have otherwise surrendered to meet their obligations under the national RET scheme, towards their GGAS obligations.

The rationale for this provision was that NSW consumers had already (involuntarily) paid for the abatement associated with the renewable energy generation required to meet the RET.

The maximum number of RECs that could be surrendered to meet obligations associated with NSW electricity sales and counted towards GGAS obligations in any given year was equivalent to the RET's Renewable Power Percentage (RPP) for that year. In 2003, the RPP was 0.88%, and increased to 9.15% by 2012.

In the final years of the scheme, benchmark participants' ability to count abatement created under the RET scheme had a significant impact on the demand for NGACs. For example, in the last year of GGAS (2012) RECs represented 27.8% of abatement obligations compared to 8.6% in 2008 and 9.9% 2009.

# 4 Lessons learned

The GGAS experience provides a number of lessons about the design and operation of a market-based scheme to deliver positive environmental outcomes. In particular, it highlights the importance of:

- setting achievable but challenging targets and providing a transparent mechanism for adjusting them over time
- establishing penalties and shortfall allowances as a means of ensuring compliance and managing risks of potential supply shortfalls
- providing sufficient flexibility in the design so that unforeseen issues can be addressed
- minimising the risks and uncertainties inherent in regulatory markets and facilitating market development
- establishing market confidence in abatement certificates and their value as a tradeable commodity
- establishing a strong regulatory regime that ensures the integrity of the scheme
- limiting the ability to surrender certificates from unrelated schemes.

GGAS also provides some lessons about the implementation and administration of such schemes, as well as implications for policy delivery in general. These include the value of engaging and consulting with stakeholders, providing transparent information and a user-friendly certificate registry, and focusing on keeping the costs of participation as low as possible.

## 4.1 Setting and maintaining appropriate targets

The Grattan Institute analysis has found that Australian trading schemes that have operated for some time, such as GGAS, have over-delivered on meeting their targets at lower costs than anticipated.[20]

In setting their initial targets, each of these schemes relied on economic modelling to establish the likely supply curve for complying activities and the appropriate level of demand at an affordable economic cost. They then set targets in line with this level of demand. However, the data on which this modelling relied were incomplete. In addition, the models could not anticipate how the market would respond to the signal provided by the schemes. In particular, it was hard to anticipate the new business models and technological innovation that would develop in response to the economic incentives. For example, GGAS did not anticipate the interest from the waste coal mine gas sector.

[20] Grattan Institute, *Learning the hard way: Australian policies to reduce carbon emissions*, April 2011.

This experience suggests that a well-designed scheme should include a transparent mechanism for adjusting targets while maintaining market confidence. While it would not be prudent for scheme designers to count on the scheme promoting innovation that leads to more emission reductions at lower prices than expected from current technologies and delivery methods, they should not be surprised if it does.

## 4.2 Determining appropriate penalties and shortfall allowances

While penalty regimes are necessary to encourage compliance and increase the likelihood that environmental outcomes will be met, they don't necessarily need to be punitive to achieve this. Furthermore, penalties can provide a form of risk management. At the time of scheme design, the costs of abatement were not known with certainty. The penalty provided a means for retailers to 'buy out' their obligations and avoid too large an impact on prices should abatement have been more expensive than expected.

The GGAS penalty rates[21] were based on economic modelling of the estimated costs to meet the proposed targets, and were set at a margin above these costs. There was no 'make good' provision: if a penalty was paid, the benchmark participant did not still need to meet its target. This meant that the penalties operated as a cap on the cost of compliance with the scheme.

This contrasts to the approach proposed for other schemes, where penalties are set based on a multiple of the modelled costs of meeting the targets. As this approach effectively places a premium on achieving the targets, it could be expected to do this more effectively than the GGAS approach.

However, GGAS's experience was that most benchmark participants complied with their obligations by surrendering certificates; only a few chose to pay the penalty (see section 2.3). One reason for this was the culture of voluntary compliance IPART fostered among the scheme's participants and their desire to manage reputational risk. Another was the small margin (10%) by which benchmark participants could fall short of their target in any year without paying a penalty (known as the shortfall allowance).[22] This provided some flexibility to benchmark participants to manage their forward contracts for supply of certificates. Most participants did not have to take advantage of this flexibility; however, some utilised it every year for their own commercial reasons.

21 The 'penalty' regime that operated under GGAS was a valuable risk management mechanism, and would more accurately be described as a 'buy-out' price or option. By paying a penalty, a Benchmark Participant in effect complied with their benchmark requirement.

22 Such shortfalls had to be met in the following year, together with that year's requirements.

## 4.3 Providing flexibility in the scheme design

All schemes face problems or issues that were not foreseen during the design phase, and so are likely to require technical changes to ensure the policy objectives can be fully met. It is important that the scheme design provides sufficient flexibility for these minor but important changes to be made quickly.

For example, GGAS participants sometimes responded to the scheme in unexpected ways that threatened the integrity of the scheme. In particular, certificate providers accredited under the Demand Side Abatement (DSA) Rule were able to replace inefficient incandescent lamps by installing efficient compact fluorescent light globes (CFLs). This activity grew rapidly, and because some were of poor quality, consumers reverted to incandescent lamps when the CFLs failed. In addition, many certificate providers gave free CFLs to consumers, but did not ensure they were actually installed before claiming certificates. There were also cases where the CFLs installed replaced a pre-existing CFL rather than an incandescent lamp, so the energy savings were negligible. These issues were able to be addressed relatively quickly because the DSA Rule could be amended by the Minister without the need for legislative change.

While this flexibility can provide some uncertainty for scheme participants, it can be managed to some extent through good practices such as consulting with stakeholders prior to any technical changes; effectively communicating any changes and the reasons for them; and providing for transition arrangements or a transition period to ensure those who had invested in good faith were not unduly disadvantaged.

In addition, the flexibility should not extend to targets, penalties and other major scheme parameters, which need to be relatively difficult to change to provide certainty for the market and to encourage investment. In GGAS, this balance between certainty and flexibility was achieved through the 3-tiered legislative architecture (Act, Regulation, and Rules) described in Appendix B.

## 4.4 Minimising market risks and uncertainties

Emissions trading markets, like all regulatory markets,[23] have some inherent risks and uncertainties for participants:

- First, these markets tend to be very small relative to traditional financial markets.
- Second, since their purpose is to provide a means to achieve a compliance target, they tend to encourage participants to buy and hold certificates – even though it may be more rational to sell and repurchase at a later date. This is due to the risk that they may not be able to purchase certificates if supply is short.
- Third, these markets face a major regulatory risk. Since they exist entirely because of government action, they are subject to the changes of rules or government policy.

It is important to provide certainty to investors that projects undertaken will not be made financially unviable by design changes if they are implemented in accordance with the scheme design parameters operating at the time of seeking accreditation. This must be balanced by the need to include some flexibility in design in the event that unexpected outcomes risk compromising the scheme's objectives.

In the case of GGAS, which focused on the electricity sector where assets have long lives, there was a particular need to manage regulatory risk to encourage investment. This was done by establishing the scheme through legislation, and setting out its main parameters in the Act and Regulation (which meant they were relatively difficult to change).

However, as discussed above, GGAS's technical details were set out in the Rules, which meant they could be amended fairly quickly to address unforeseen issues. While this provided important flexibility, it has been suggested that the frequency of amendments to these Rules[24] had an adverse impact on the willingness of some companies to participate, which led to a higher cost of meeting the GGAS targets.

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23 In this context 'regulatory markets' refer to markets that are specifically created by government through legislation to deliver a stated policy intent, in this instance an environmental outcome.

24 The Generation Rule was amended twice in 2005 and 2010; the Demand Side Abatement Rule was amended 4 times in 2005, 2006, 2008 and 2009; the Carbon Sequestration Rule was amended once in 2010 and the Large User Abatement Certificates Rule was never amended.

## 4.5 Establishing market confidence in abatement certificates

It is important that the potential providers of abatement certificates are confident there will be a market for certificates, and that potential buyers are confident that certificates will retain their value as tradeable goods, and as a means for meeting their scheme obligations. GGAS created this confidence in several ways.

In terms of market design, GGAS allowed unlimited banking of certificates. That is, once created, a certificate could be bought and sold unlimited times before being taken out of circulation when it was 'extinguished' through surrender to the compliance regulator. This encouraged early investment in abatement projects, and supported market fluidity.

The only limitation imposed by the scheme was that certificate creators had 6 months after the end of a calendar year to register any abatement certificates from the previous year's activities. In this way, GGAS supported the concept of vintage for certificate creation. To meet their compliance obligations for any one year, a benchmark participant was required to surrender certificates from that year's abatement activity (vintage) or earlier.

In addition, the responsibility for certificate verification and validity was placed on the certificate creator, not the buyer. If certificates were found to have been invalidly created after they had been purchased (eg, through subsequent audit), the creator had to forfeit an equal number of validly created certificates, and or pay a penalty. This helped to facilitate market confidence for certificates.

GGAS legislation did not require the scheme administrator to develop a trading platform – only to manage a register that recorded ownership of certificates. The development of a trading platform may have made the market more transparent and negated the need for direct relationships between the certificate creator and buyer. However, the absence of a trading platform led to several brokers making a business from facilitating trading. IPART took the view that these matters were best left to the market rather than the scheme administrator.

## 4.6 Establishing a strong regulatory regime

One of the key factors for GGAS's success was its strong regulatory regime. This regulatory regime and regulatory culture were essential to ensuring the integrity of the scheme. Key ingredients included:

- strong and enforceable (legislated) regulatory powers (Act, Regulation, Rules)
- a strong, well-trained and independent pool of auditors
- a scheme administrator and compliance regulator motivated to achieving the scheme's objectives
- clear conditions of accreditation for participants

- a strong focus on ensuring participants had robust record keeping arrangements and reporting systems
- risk-based approach to monitoring and enforcing compliance
- a culture of compliance amongst participants
- clear and enforceable penalties for non-compliance.

## 4.7 Surrender of certificates from other schemes

Another lesson in the design of greenhouse gas schemes relates to how one market-based scheme relates to other market-based schemes. If the schemes are based on completely different pricing mechanisms, their interaction will cause a distortion to one or both schemes.

This was the situation encountered by GGAS. An analysis of GGAS outcomes indicates that the number of RECs surrendered into GGAS (approximately 20.2 million tonnes of abatement) was well in excess of the surplus number of NGACs (10.7 million) remaining when GGAS was terminated. It is noted that this number is likely to be somewhat conservative because many certificate providers chose not to create certificates in 2012 to avoid audit costs for verifying certificates that had little value and no clear market.

The lesson here is to either (a) design independently administered schemes on the same principles, or if this is not possible (b) not to allow unrelated schemes to interact.

## 4.8 Engaging stakeholders, providing transparent information and minimising costs

Several elements in the development and implementation of GGAS were particularly important to its successful delivery. The first was frequent consultation. For example, during the early design phase, the NSW Department of Water and Energy hosted a number of meetings with stakeholders. Then through the implementation phase, IPART ran a series of stakeholder workshops to explain how GGAS operated. It also developed a set of clear documents setting out the requirements under the GGAS Rules. Both initiatives were critical in encouraging and facilitating participation in the scheme.

The second key element was transparent information. Throughout the life of GGAS, monitoring and reporting requirements ensured that transparent information was available to the market and other stakeholders. IPART provided a comprehensive public report on the compliance and operation of GGAS each year, which included scenarios of future projections of supply and demand of abatement certificates. This was valuable information for GGAS participants and market analysts. A further degree of transparency was provided through the GGAS registry where public access to non-commercial information was available on all accredited projects. IPART also published a quarterly newsletter which was used to keep participants informed of developments in the scheme.

The third element was the strong focus on GGAS's cost impacts and their implications for the NSW economy. The goal of GGAS was to unlock sources of low-cost abatement while keeping transaction costs down. Taking a risk-based approach to verification and validation of certificates that rewarded good performance helped to achieve a balance between good compliance and low transaction costs.

# Appendices

# A NSW and the National Electricity Market

The National Electricity Market (NEM) commenced in December 1998 and provides a single uniform marketplace for the trading of wholesale electricity across all Australian states and territories, with the exception of Western Australia and the Northern Territory. It has around 200 large generators, 5 state based transmission networks (linked by interstate connectors) and 13 major distribution networks.[25]

The NEM is the world's longest interconnected power system, covering a distance of approximately 4,500 kilometres.[26] Approximately $6 billion of electricity is traded annually in the NEM to meet the demand of almost 10 million end-use consumers.[27] In 2011/12 the market generated 199,000,000 MWh of electricity.

New South Wales (NSW) has around 18,000 megawatts (MW)[28] of installed electricity generation capacity. Black coal generators account for the majority of large scale generation capacity. Gas, hydro and wind make up most of the remaining capacity. Interconnectors with Queensland and Victoria provide additional capacity of about 1100 MW and 1500 MW respectively.[29]

In NSW, state owned corporations own around 90% of generation capacity. In 2011, the NSW Government sold the electricity trading rights to around one-third of state owned capacity to TRUenergy (rebranded in 2012 as EnergyAustralia) and Origin Energy. Following the sale, control over the dispatch of state owned generation is now split between the government entities Macquarie Generation (28%) and Delta Electricity (12%), and the private entities EnergyAustralia (16%) and Origin Energy (22%).

In September 2012, the NSW Government announced a scoping study was underway on the proposed privatisation of its remaining state owned generation assets. As in Victoria, Snowy Hydro also has market share in generation (15%).

Four state-owned companies transport electricity around NSW. TransGrid manages the high voltage transmission power lines and towers, cables and substations, while 3 electricity distributors, Essential Energy, Ausgrid and Endeavour Energy, deliver the electricity to consumers in their network regions.

25 Australian Energy Regulator, *The State of the Energy Market 2012*, December 2012.
26 www.energy.nsw.gov.au; July 2013.
27 Australian Energy Regulator, *The State of the Energy Market 2012*, December 2012.
28 www.energy.nsw.gov.au; July 2013.
29 Ibid.

# B Overview of GGAS – objectives and design

In 1996 (after the commencement of the NSW State Electricity Market) the NSW Government introduced a voluntary greenhouse gas benchmark scheme to NSW electricity retailers via a condition in their retail licence. The licence required these retailers to develop strategies and plans to meet greenhouse gas benchmark targets, but there were no penalties if benchmarks were not met. The licence condition operated until the end of 2002, when it was replaced by the GGAS legislative package. During its 6 years of operation, the voluntary scheme provided many lessons which were used to guide the development of GGAS.

GGAS commenced in January 2003. It was created by the NSW Government through amendments to the *Electricity Supply Act 1995* (the Act) and the *Electricity Supply (General) Regulation 2001* (the Regulation). The Act set out the objectives and greenhouse gas benchmarks for the scheme, as well as its lifetime, coverage and key design elements. The Regulation outlined the key aspects of the scheme's operation.

This legislative framework was supported by 5 Greenhouse Gas Benchmark Rules (the Rules),[30] which were issued by the Minister for Energy. These Rules set out the eligibility requirements and calculation methodologies for creating certificates under GGAS.

## B.1 Design of GGAS

The baseline-and-credit scheme was chosen because GGAS was intended to cover a single jurisdiction (NSW) that sourced its electricity in a competitive market (the NEM) and included generators in jurisdictions not covered by the scheme. It was not feasible to apply compliance obligations at the point of emission – ie, on generators – as is ideal under a cap-and-trade scheme. In this situation, it was considered that using a cap-and-trade design could lead to unintended outcomes.

It was decided to place compliance obligations on electricity retailers rather than distribution network suppliers, as there were only a few distributors in the market. Thus, there would have been little competition between these entities to drive down compliance costs. As there were numerous electricity retailers, they were likely to be the most efficient point of compliance for GGAS.

[30] The Greenhouse Gas Benchmark Rule (Compliance) No. 1 of 2003, the Greenhouse Gas Benchmark Rule (Generation) No. 2 of 2003, the Greenhouse Gas Benchmark Rule (Demand Side Abatement) No. 3 of 2003, the Greenhouse Gas Benchmark Rule (Large User Abatement Certificates) No. 4 of 2003, and the Greenhouse Gas Benchmark Rule (Carbon Sequestration) No. 5 of 2003, as amended from time to time.

In addition, retailers already had experience of the precursor voluntary greenhouse benchmarks scheme. They also had experience in meeting compliance obligations by surrendering certificates in the national Renewable Energy Target scheme which commenced in 2001.

Therefore a baseline-and-credit design was adopted whereby:

- compliance obligations were placed primarily on electricity retailers active in NSW (in respect of the electricity sold to customers in NSW)
- credits (in the form of tradeable certificates) could be earned by all generators across the NEM for either generation at an emissions intensity below the annual NSW emissions intensity average, or from efficiency improvements above their baseline
- credits could be earned by other abatement certificate providers for eligible activities in NSW (and later, the ACT).

## B.2 Objectives, lifetime and coverage

The objectives of GGAS were to:

- reduce greenhouse gas emissions associated with the production and use of electricity, and
- encourage participation in activities to offset the production of greenhouse gas emissions.[31]

It was intended to be an interim scheme that would operate until a national emissions trading scheme was established. It was initially legislated to commence in 2003 and end in 2012, but was later extended to end in 2021 or the date on which a national scheme commenced.

Compliance with GGAS initially covered greenhouse gas emissions from electricity consumed in NSW. In 2005, the Australian Capital Territory (ACT) joined GGAS. ACT compliance obligations were managed by the Independent Competition and Regulatory Commission (ICRC) and IPART managed the accreditation activities of businesses in the ACT. While some aspects of GGAS were limited to NSW (demand side abatement activities, carbon sequestration, and large user abatement) because electricity generation is sold through the NEM, all eligible generation projects in the NEM were able to participate in the scheme.

[31] In line with the Kyoto Protocol, these emissions included carbon dioxide, methane, nitrous oxide, sulphur hexafluoride and perfluorocarbon emissions. In assessing the impact of reductions in emissions, all were converted to tonnes of carbon dioxide equivalent (tCO2e) according to their published Global Warming Potentials.

## B.3 Key design features

The key design features of GGAS – including its targets, baseline, liable parties, abatement certificates, eligible abatement activities, abatement certificate providers and penalties – are outlined below.

### B.3.1 Targets (benchmarks)

GGAS was legislated with a state-wide target (called the State greenhouse gas benchmark) for each year from 2003 to 2012 (when it was originally legislated to end). This benchmark represented the targeted level of emissions expressed in tonnes of carbon dioxide equivalent (tCO2e) per capita.[32] The initial benchmark for 2003 was 8.65 tCO2e per capita and reduced each year until 2007 when it reached 7.27 tCO2e per capita. It then remained at this level until the end of the scheme.

### B.3.2 Baseline (NSW pool coefficient)

The 'NSW pool coefficient' was an important input for calculating a benchmark participant's individual baseline and attributable emissions. It was also used as the emissions intensity baseline for calculating the level of abatement a certificate provider could claim to have provided.

The NSW pool coefficient was defined as the average emissions per unit of electricity delivered at transmission nodes for all generating systems supplying the notional NSW pool, as determined in accordance with the GGAS Compliance Rule. As part of its role as Compliance Regulator, IPART determined the value of the NSW pool coefficient each year, and announced this value by 30 November. In 2003, the initial value of the NSW pool coefficient was 0.897 tCO2e per MWh. It rose each year, and reached 0.976 tCO2e per MWh in 2012. This increase was attributed to the drought in Australia, which meant that less hydroelectricity was sourced from the Snowy Hydro Electric Scheme as the overall demand for electricity in the NEM increased.

[32] These greenhouse gas benchmarks were multiplied by the total NSW population, as published by the Scheme Administrator, to give the annual NSW electricity sector benchmark. This benchmark represented the total amount of greenhouse gas emissions allowable for the consumption of electricity in NSW.

### B.3.3 Liable parties and their obligations

The parties liable to meet GGAS benchmarks (collectively known as benchmark participants) included mandatory and elective participants:

- **Mandatory benchmark participants** included all electricity retailers active in the NSW retail market. They also included generators that supplied electricity directly to consumers in NSW (which were liable only in respect of the load they supplied directly to those customers).
- **Elective benchmark participants** included Large Electricity Users[33] that chose to manage their own benchmarks. These participants took over the responsibility for the GGAS obligations associated with their own electricity consumption in NSW from their electricity supplier.

Each benchmark participant was obliged to meet a share of the State greenhouse gas benchmark that reflected its share of the emissions attributable to electricity consumed in NSW. They were required to calculate their individual annual benchmark in tCO2e, and then reduce their attributable emissions to this level and/or offset excess emissions by purchasing and surrendering abatement certificates from abatement certificate providers.

### B.3.4 Abatement certificates

Two types of abatement certificate could be created under GGAS, and surrendered by benchmark participants to meet their obligations under the scheme:

- **NSW Greenhouse Abatement Certificates (NGACs).** These tradeable certificates could be created by any abatement certificate provider undertaking eligible abatement activities, as defined in the Generation Rule, the Demand Side Abatement Rule and the Carbon Sequestration Rule. They could then be purchased by any benchmark participant and surrendered to meet its individual benchmark.
- **Large User Abatement Certificates (LUACs).** These non-tradeable certificates could only be created by elective benchmark participants for the eligible activities defined in the Large User Abatement Certificate Rule. They could then be surrendered by those participants towards meeting their benchmark.

[33] Defined as those using more than 100 GWh per year, at least 50 GWh per year of which was used at a single site.

In addition, to ease the compliance burden on NSW electricity retailers and their customers, benchmark participants could also count a limited number of the Renewable Energy Certificates they surrendered to meet their obligations under the national Renewable Energy Target scheme[34] towards their GGAS obligations.[35] The rationale for this provision was that NSW consumers had already (involuntarily) paid for the abatement associated with the renewable energy generation required to meet the RET.

Each of the GGAS certificates represented 1 tCO2e of emissions reduction or offset.

### B.3.5 Eligible abatement activities

Eligible activities for the creation of NGACs and LUACs were defined in the Rules, and included:

- low-emission generation of electricity (including cogeneration) and improvements in the emissions intensity of existing generation
- energy efficiency activities that reduced energy consumption
- low-emission on-site generation activities (including cogeneration) that resulted in reduced consumption of electricity from the national electricity grid
- sequestration of carbon from the atmosphere in eligible forests
- activities that reduced non-electricity related greenhouse gas emissions from industrial processes in NSW.

### B.3.6 Abatement certificate providers and their responsibilities

To create NGACs, parties had to be accredited under the scheme. These abatement certificate providers – rather than the benchmark participants that bought the certificates – were responsible for the validity of the NGACs they registered. If, after they were traded, the certificates were found to be invalid, the Scheme Administrator had the power to require the abatement certificate provider to make up for any invalidly created certificates via the purchase and forfeit of certificates. This ensured that the market for certificates could operate with confidence that all certificates would be recognised for compliance purposes.

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34 The Australian Government introduced the Renewable Energy Target in 2001. It initially required electricity retailers to source renewable energy to meet a national target of 9,500 GWh (expanded in 2009 to 45,000 GWh).

35 The maximum number of RECs that could be surrendered to meet obligations associated with NSW electricity sales and counted towards GGAS obligations in any given year was equivalent to the RET's Renewable Power Percentage (RPP) for that year. In 2003 the RPP was 0.88%, increasing to 9.15% by 2012. It should be noted that RECs associated with 'GreenPower' – where electricity customers paid a premium to purchase electricity generated from renewable sources – were excluded.

### B.3.7 Penalties for non-compliance

GGAS imposed a financial penalty on benchmark participants that failed to surrender sufficient certificates to meet their benchmark for a compliance year. This penalty was intended to encourage compliance by benchmark participants. It also put a cap on the cost of the scheme. That is, the price of an abatement certificate could go up, but only to the maximum of the penalty. Beyond this point it would be better for participants to pay the penalty rather than surrender certificates to meet their obligations. By paying a penalty, benchmark participants were considered to have complied with their obligations.

# C Stakeholder and commentator views on GGAS, its overall achievements and effectiveness

## C.1 Murray Hogarth, Principal, the 3rd degree[36]

"In introducing GGAS in 2003 as a mandatory emissions trading scheme, the NSW Government showed early leadership, and sent an early signal to the corporate sector that "something was happening" in pricing carbon in NSW. In a political context where there was no agreement nationally, the NSW Government made a genuine policy contribution, and despite criticisms implementing GGAS, it showed a boldness in policy terms. Given that GGAS was the first mandatory emissions trading scheme in the world, mistakes were made, but the NSW Government was able to learn from this experience. Although it took time for the impact of GGAS to be seen, it had a definite impact in the market place, and led to many new projects. The scheme also provided experience for the power industry in trading carbon instruments.

GGAS also unlocked the creativity of the market in developing innovative marketing strategies, for instance to roll-out Compact Fluorescent Lamps (CFLs) to consumers in large numbers where previously market penetration had been relatively small. Arguably this brought forward by some years the time when CFLs would be widely adopted by consumers. These programs driven by GGAS also engaged millions of households in energy efficiency, and overall had a community-wide impact. However, it also became clear that operating in a small, not very transparent market where rules changed at short notice was risky for business and not sustainable in the long term. However, it did provide "pump priming" for the market and helped develop necessary infrastructure and expertise. Many of the companies and people involved in the CFL roll-outs are still in the energy services industry today.

A GGAS legacy will live on through its role in shaping the ongoing Energy Saving Scheme in NSW, including the development of 'deeming' equations for energy saving or carbon reduction for specific activities, which in turn is likely to influence a future National Energy Saving Initiative."

## C.2 Jeff Angel, Executive Director, Total Environment Centre

"GGAS was a very successful policy in terms of developing the market place for emissions reductions and developing a system of metrics for greenhouse gases that facilitated the market. GGAS was somewhat successful in terms of stabilising NSW Greenhouse gas emissions per capita, but was unsuccessful in predicting the impacts on electricity prices for industry and households. The unrealised fears about the impact of GGAS on electricity prices meant that targets were set at too conservative levels, although the low cost of the scheme meant that it was possible for NSW to implement an ambitious policy without "frightening the horses.

[36] Murray Hogarth was formerly environment editor for the Sydney Morning Herald, and from 1999 to 2008 senior consultant (and managing partner 2007-08) with the Ecos Corporation which advised large corporate entities on sustainability.

At a detailed design level, GGAS could have been improved by not allowing the use of inter-state activities (in electricity generation) to be credited under the scheme. The application of the "100 year rule" within the Carbon Sequestration Rule provided a legitimate test of carbon sequestration. Overall the GGAS architecture worked well. GGAS was also a part of a suite of state-based activities to reduce greenhouse gas emissions in the absence of Federal Government action, and demonstrated that States could take the lead in areas of national policy interest. In introducing GGAS, it had been good to make a start in a new area of applying economic instruments to drive reductions in greenhouse gas emissions. Consultation by government in the policy development had been good, if challenging in terms of resources and technical expertise for the environmental movement in dealing with the economic side of the policy development.

Overall, in taking the lead, the NSW Government showed that the impacts of action on climate through such policy was not nearly as severe as some had suggested, and the market had operated in creative ways to reduce the costs of meeting the targets, indicating that targets could have been strengthened without damaging the NSW economy."

## C.3 Bruce Mountain, Acting Policy Director, Energy Users Association of Australia (EUAA)[37]

"Generally, the EUAA did not pay a lot of attention to GGAS because of its modest impact on energy prices in NSW. In addition, GGAS was seen as a relatively unstable policy, with no stable price profile. The role of the Australian Government in emissions trading at a national level added to the uncertainty about the future for GGAS. However GGAS was innovative in Australia as an emissions trading scheme, from which there were some positive learnings.

The view of GGAS was also coloured by the bad publicity surrounding the Compact Fluorescent Lamp handouts, raising concerns about the level of real additional abatement that was delivered by the scheme, and that consumers were paying for nothing through the scheme. By the end of GGAS with the price of certificates very low, the scheme became less of an economic issue for business, but there were concerns that it added to the level of 'green tape' that had to be dealt with."

## C.4 Paul Sutton, Senior Policy Officer, Climate Change, Department of Environment and Sustainable Development, ACT Government

"From the policy side of things, GGAS has been one of the ACT's most effective schemes in tackling emissions from electricity use. The Scheme has been regularly cited in media announcements by the Directorate and Minister as one of the Territory's most effective climate change actions and a world first mandatory greenhouse gas emissions trading scheme. It has been a good news story for the Government.

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37 The EUAA is the peak industry association representing the interests of large users (typically industry) of energy in Australia.

GGAS has been incorporated into the ACT Government's climate change strategies. Weathering the Change, Action Plan 1 had a specific action to continue GGAS. Lessons learnt from GGAS have supported the development of new actions in the ACT, such as the Energy Efficiency Improvement Scheme (EEIS).

From a high level policy viewpoint, we found the scheme invaluable in educating stakeholders on market based approaches to climate change issues and in delivering relatively low cost/low impact on household abatement."

## C.5 George Wilkenfeld, Principal of George Wilkenfeld & Associates (GWA)[38]

"In general there are problems with any baseline-and-credit scheme, both in the setting of a baseline and in the amount of credit given for various actions. In the case of GGAS, the initial design was probably the best that could have been achieved at the time, but the process was compromised by the political imperative to achieve (on paper) an artificial and predetermined target.

The greatest failing of GGAS was that it created "paper benefits" rather than "real abatement" which can only come from a change in behaviour compared to business-as-usual. GWA estimated that the real abatement may only have been of the order of 20-25% of the total number of certificates created. This disparity arose for a number of reasons including the large number of "grandfathered" generation projects (Category A), the wasteful CFL giveaway programs, and importing paper benefits from interstate.

In particular, there was concern that GGAS channelled significant economic benefits to inherently greenhouse-intensive brown coal generators, thereby supporting their ongoing operations. Overall, it was considered that the cost-effectiveness of GGAS was not high.

However, GGAS was very professionally administered by IPART which put in place many measures to maintain the integrity of the scheme. In the case of the CFL giveaway programs, when it became clear that the scheme was crediting excessive abatement, IPART moved to have the DSA Rule amended to address the issue, albeit after the fact.

GWA expressed the view that the lessons and impacts of GGAS should be thoroughly evaluated before any baseline-and-credit national energy saving scheme is considered."

38 GWA is a consultancy providing expert energy efficiency and greenhouse policy advice. GWA was involved in the original design of GGAS.

## C.6 Centre for Energy and Environmental Markets, University of NSW (comments are taken from 2 publications)[39,40]

"There is no doubt that some projects that created NGACs represent additional abatement, and the scheme is likely to drive some additional investment in generation that has lower emissions than would otherwise have been the case. However, additionality concerns remain for many of the projects that have created NGACs to date, and relate to whether the abatement has occurred, and if it has, whether it was driven by other government policies, or whether the activity would have occurred anyway because of, for example, technological improvements or the need for peaking plant.

It is possible the GGAS could delay meaningful action, not only because it may create a perception that emissions are already being reduced, but also because firms that base their business plans on it are likely to actively oppose any later changes in scheme design.

Key problems include:

- the scheme's 'baseline and credit' design built around complex and imputed emission reductions: estimating emission reductions requires 'counterfactual' assumptions about what would have happened otherwise,
- the highly abstracted targets, wide range of offset activities and rules for estimating emissions reductions: it is entirely possible for the scheme's targets to be met while NSW electricity related emissions continue to rise,
- the questionable additionality of many of the projects being accredited as reducing emissions and now receiving a cashflow from the scheme: many of these activities were implemented prior to the scheme or are very likely to have occurred regardless.

Fundamental design features (which cannot be changed without creating an entirely new scheme) mean that a significant proportion of the NGACs are unlikely to correspond to the claimed emissions reductions. These design features are that:

1. The number of NGACs created by most projects is calculated with respect to an imputed and rather abstract NSW pool coefficient. One consequence is that new low-emission projects built in response to demand growth, and whose emissions are not incorporated into the pool coefficient, will increase emissions while at the same time creating NGACs.
2. Each NGAC corresponds to an absence of emissions, which cannot be measured but must be estimated with respect to a projection of what would have happened in the scheme's absence. This is inherently counterfactual and means that the scheme's outcomes (NGAC creation) are separated from the physical aim to reduce emissions.

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39 Robert Passey; Iain MacGill; Hugh Outhred: *The NSW Greenhouse Gas Reduction Scheme: An analysis of the NGAC Registry for the 2003, 2004 and 2005 Compliance Periods. Sources of registered NGACs, Estimated impacts on NSW electricity emissions, Unresolved issues of Scheme design & additionality, and Governance implications*, CEEM discussion paper no. DP_070822, August 2007.

40 Robert Passey; Iain MacGill; Hugh Outhred: *The governance challenge for implementing effective market-based climate policies: A case study of The New South Wales Greenhouse Gas Reduction Scheme*, Energy Policy, v36, issue 8 (Aug 2008), pp 3009 - 3018.

A key problem is that physical, measurable emissions within NSW are not directly incorporated into the calculation of the scheme's target or its performance against this target. It is entirely possible for the scheme to be apparently delivering emissions reductions while physical emissions continue to rise.

Demand Side Abatement is a significant but very problematic part of GGAS. The problem lies in the enormous range of end-use equipment and actions that impact on energy demand. There is, then, the challenge of determining appropriate baselines from which credit for 'abatement' might be calculated for these numerous and diverse activities. For example, almost all the NGACs created by small-scale DSA projects were calculated using the Default Abatement Factors Method where the abatement is 'deemed' to have occurred at the time of installation.

RECs created through the Australian Government's MRET scheme that are associated with electricity sold in NSW can be used to meet participants' liabilities under GGAS. The associated low emission generation would occur regardless of the GGAS and so these NGACs lack policy additionality. This is a design feature that could be readily addressed by not allowing such RECs to be used to meet retailers' liabilities."

## C.7 Origin Energy: Mary Whyte, Manager, Wholesale Portfolio and Emily Brodie, Carbon and Green Regulation Manager[41]

"Origin Energy operated a number of gas-fired generators and demand side abatement projects that were accredited under GGAS. The forecast NGAC revenue was a contributing factor in investment decisions on many of these plants. In addition, NGAC revenue was part of the cost profile of the accredited stations, with the Power Station operators incorporating possible NGAC revenue into short term dispatch decisions.

GGAS policy settings were clear, and well understood and Origin Energy was an active participant in the scheme. The market for NGACs was easy to access and sufficiently liquid such that participants were happy to work with the brokered spot market to buy and sell NGACs. The Scheme was well administered, and IPART was responsive to requests for clarification/information about the scheme or a project. The closure of GGAS was well communicated, well managed and ran relatively smoothly through a simple process of cancellation of accreditations and bundled audits for 2011 and 2012, which was facilitated by IPART.

The GGAS audit regime was thorough, and although it was more onerous than those of some other schemes, the data were reliable. The establishment of the GGAS Audit Panel was an effective administrative measure, but the tripartite Deed Polls seemed unduly bureaucratic and time consuming and costly to run. The requirement to change auditors after 3 audits also added to the costs in staff time to train the new auditors. Audit costs were a real expense that could not always be fully recovered through tariff settings.

41 Under GGAS, Origin Energy was a liable party (benchmark participant) and a creator of NGACs (abatement certificate provider).

The GGAS registry operated smoothly, facilitating market and compliance transactions. However, certificate surrender functionality could have been improved. Registry users were able to select certificates for surrender based on year (vintage), generation type and state. To support in-house accounting methods, it would have been preferable to have the ability to select certificates by serial numbers or batches of serial numbers.

A major legacy of GGAS has been the capacity building that occurred with greater competencies and a larger number of trained and experienced staff in the auditing, legal and regulatory communities, through "learning by doing". GGAS scheme participants also now have greater knowledge and more sophisticated in-house data collection skills for reporting on greenhouse gas emissions.

Many of the principles and approaches developed in the operation and administration of GGAS have been replicated in other schemes. GGAS has also led to a wider understanding of carbon trading."

## C.8 AGL: Tim Nelson, Head of Economics, Policy and Sustainability[42]

"GGAS was the first legally binding emissions scheme with a price on carbon and was a "line in the sand" for all energy companies in that for the first time, emitting greenhouse gases would incur a financial liability. GGAS had a greater impact on the electricity industry than most people understand as it necessitated a strategic response to the issue of climate change from all companies (irrespective of their views about international negotiations and treaties) for the first time.

GGAS also provided financial incentives to reduce greenhouse gas emissions. In combination with the Commonwealth's Renewable Energy Target scheme, this led to many new landfill gas projects. By reducing transactional costs in energy efficiency, GGAS led to many demand side activities which have contributed to ongoing reductions in electricity demand in NSW.

The demand side measures that were largely driven by GGAS were not anticipated, and is a measure of the benefits of market-based mechanisms.

While some of the measures that resulted from GGAS had unintended consequences, the manner in which they were addressed provided good lessons for future policy development. In particular, the need to communicate to all parties equally about proposed changes such as the removal of Category A generation could have been handled better.

IPART's performance as a regulator and scheme administrator was excellent. AGL had very few issues in its dealings with IPART and staff were very responsive to questions or points of clarification through good communication and transparent decision-making.

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42 Under GGAS, AGL was a liable party (benchmark participant) and a creator of NGACs (abatement certificate provider). AGL operated a number of generating plants that were accredited under GGAS as Category A (legacy) generators, existing gas-fired generators and new landfill gas generators. It also was accredited under the DSA Rule for programs replacing electric hot water systems with gas hot water systems. Over the life of GGAS it created 7.9 million NGACs.

The audit regime worked effectively, particularly for generation projects which were generally easier to audit. There was however, scope for improvement in audits of the more diffuse DSA projects.

Overall, AGL's experience with GGAS was very positive. As the world's first greenhouse gas abatement scheme, participation provided AGL with experience that will no doubt be very beneficial when participating in future policies (such as the carbon price under the Clean Energy Act)."

# D Participant's views and experiences in GGAS

## D.1 Michael Lebbon, Commercial Manager, LMS Energy Pty Ltd

Over the life of GGAS, LMS Energy Pty Ltd (LMS) had 18 separate new projects in NSW, Queensland, Victoria and Tasmania accredited under the GGAS Generation Rule. These projects typically comprised one or more internal combustion engines combusting landfill gas (LFG) to generate electricity for export to the grid. In most cases, the LFG was extracted under vacuum from a network of underground pipes embedded in the landfill. The combined generating capacity of LMS accredited projects was 38 MW. Over the life of GGAS, these projects led to the creation of 4,302,267 NGACs.

When GGAS closed, all of LMS' LFG generation projects transitioned (or are expected to transition) to the Australian Government's Carbon Farming Initiative (CFI).

"For LMS the GGAS experience has been an overwhelming positive one. All of LMS' landfill gas generation projects were built off the back of carbon credit schemes. The overwhelming majority of LMS' generation projects were built because of GGAS, three generation projects operated under Greenhouse Friendly – however this was due to their ineligibility for GGAS as they were based in WA and NT. Below is a list of the positive aspects LMS experienced under GGAS:

- NGACs provided a vital third revenue stream for LFG projects, Energy and RECs alone are not enough to make most landfill gas projects viable. GGAS provided the third stream enabling projects to be developed.
- Monthly creation of NGACs – allowed for stable cash flows and the ability to contract and sell NGACs with power to the same electricity retailer under the same contractual terms.
- Clear and concise accreditation rules with little or no subjectivity once the rules were set.
- The ability to suggest new methods of creating NGACs if discovered – for example the Methane estimation Uncertainty Method (MEUM).
- A knowledgeable and understanding regulator.

During the proper operational years (before uncertainty of a national carbon price) decreasing emission intensity levels for benchmark participants kept a buoyant secondary market which encouraged long term contracting of NGACs, enabling projects to be developed and banked with long term security

The only negative LMS experienced was not so much a fault of GGAS itself, but more so the wrap up/transition of GGAS. Despite the eventual transition of Non Category A GGAS LFG projects into the CFI the drawn-out uncertainty over a national carbon price did cause some angst among project proponents. GGAS itself was not to blame but it was felt better communication between the NSW Government and the Federal Government with project proponents could have made the transition process smoother."

## D.2 Jim Beckwith, Strategic Analysis Manager, Macquarie Generation

Macquarie Generation's Liddell Power Station is a large base-load station based in the Hunter Valley, commissioned in the early 1970s. Its generating system consists of 4 black coal-fired units each with a nominal rating of 500 MW. The GGAS project involved using advances in the steam path component to improve the efficiency of the Low Pressure (LP) Turbines and hence the efficiency of the entire generating system. Over the life of GGAS, it resulted in the creation of 2,745,770 NGACs.

> "GGAS provided the opportunity to strengthen our business case for upgrading the Liddell LP turbines and then later the High Pressure and Intermediate Pressure turbines. The existing turbines were age-degraded to the extent that rated output was difficult to achieve. The upgrades required an investment of around $90 million which was challenging to justify against a limited remaining life of the power station. It was predicted that a 6% heat rate improvement could be achieved with the upgrades using the same fuel input. Being able to create NGACs under Generation Rule Method 2 assisted us to provide the certainty needed to proceed with the upgrades.
>
> Initially under Method 2 of the Generation Rule, a relatively straightforward and inexpensive testing procedure was approved to verify the performance improvements gained from the LP turbine upgrades. With these tests we were able to quantify the emissions abatement achieved, which formed the main input to the creation of NGACs. With the introduction of the PITR in 2006, the testing requirements were significantly tightened and were also made retrospective to upgrades already completed. The new testing regime added both significant cost and engineering time to our auditing process to the extent that in the last year of GGAS, Macquarie Generation did not create any NGACs due to the auditing costs exceeding potential income from NGACs.
>
> Overall, the experience of being part of GGAS was a positive one in that it provided the catalyst to improve the output of the station. Additionally and because of the strict requirements of the PITR, Liddell was well placed to meet the NGERs requirements as well as the more recent obligations under the Energy Efficiency Opportunities (EEO) legislation."

## D.3 Greg Billman, Head of Trading and Portfolio Management, GDF SUEZ Australian Energy

The Generation Rule provided incentives for new low greenhouse emissions intensity as well as for efficiency improvements to existing power stations either through modest "housekeeping" improvements (Method 1) or more substantial upgrading (Method 2). Fuel switching to co-firing with less greenhouse gas intensive fuels (Method 3) was also eligible under the Generation Rule. To better estimate the efficiency gains, IPART developed and implemented the PITR to enable the more accurate estimation of greenhouse gas emission reductions. A core design feature of GGAS was that it provided incentives for all generators

connected to the National Electricity Market (serving consumers in NSW, Victoria, Queensland, South Australia and Tasmania).

The Hazelwood Power Station is a large base-load station, based in Morwell in the Latrobe Valley of Victoria. The generating system consists of eight brown coal-fired units each with a nominal rating of 200MW each. The station was progressively commissioned between 1964 and 1971. Hazelwood was a participant in the Commonwealth Generator Efficiency Standards program, and on the basis of this participation, it was accredited under Method 1 of the Generation Rule.

> "GGAS provided the Hazelwood Power Station with an incentive to improve efficiency beyond that which would have occurred without the scheme. It also kept pressure on normal maintenance and outage activities to ensure plant conditions were not slipping. With this though came the unavoidable tasks of undergoing detailed annual audits, concise record keeping as well as enduring high costs associated with the actual boiler and turbine performance tests carried out each year. Being involved in the GGAS program was a huge benefit when moving to NGERS as the systems and record keeping mentioned above provided the basis for preparing reports for NGERS.
>
> Measures undertaken at the station to improve the efficiency of the plant included:
>
> - New HP and LP turbine rotors
> - Boiler Sealing (Tramp air) refurbishments
> - Air Heater refurbishments
> - Electrostatic dust precipitator upgrade
> - New water blowers
> - Precision steam blower upgrade
> - New online condenser cleaning
> - New online condenser water dosing
> - New high efficiency mill motors
>
> As mentioned above, the GGAS program enabled Hazelwood to do more work than would have been done without the scheme. For example, much of the work in keeping the boiler tramp air in control can be attributed to the GGAS and this work had one of the biggest impacts on generation efficiency. In addition, when choosing new turbines, the GGAS program provided the incentive to choose plant which provided better generation efficiency rather than greater electrical output, which will also hold the power station in good stead in an emissions priced environment. Over the life of GGAS, the efficiency improvements at the Hazelwood Power Station resulted in the creation of 6,699,860 NGACs."

## D.4 Clint Todhunter, Manager Gas Drainage, Xstrata Coal (NSW) Pty Ltd

Xstrata Coal NSW was accredited for 2 projects as a Large Energy User, one at each of its United Collieries and Bulga Coal mines. The project at each site involved the abatement of on-site fugitive methane emissions. It consisted of installing flares to combust waste coal mine methane that was previously vented to the atmosphere. This converted the highly active greenhouse gas methane to the much less active greenhouse gas, carbon dioxide. The amount of methane combusted was measured every 15 minutes (using gas flow and composition meters on the input to the flares).

Over the life of GGAS, Xstrata Coal created 1,138,455 NGACs through these projects, and used the LUACs created towards meeting its GGAS obligations as an elective benchmark participant.

> "Xstrata Coal believes our experience from participation in the GGAS Scheme was invaluable in preparing our business for increasing climate change regulation, improving our technical knowledge around greenhouse gas abatement technology which resulted in a net positive environmental outcome at both our United and Bulga mine operations.
>
> The GGAS Scheme provided a commercial driver for our business to invest in abatement technologies at United and Bulga mine operations to significantly reduce our greenhouse gas emission profile.
>
> As part of integrating these technologies at our operations, Xstrata Coal engineers and environmental managers increased their technical knowledge and capacity in relation to flaring expertise within the business. In addition to continued operation of these flares, Xstrata has recently been able to build on this experience to extend our flaring capacity across to other mine operations within the business, where it is economically and technically feasible to do so.
>
> Despite initial teething issues with respect to the Government's registration and program guidelines in the GGAS scheme on flaring projects, Xstrata Coal was able to work collaboratively with the regulator to resolve requirements for data collection and record keeping to meet benchmark objectives under the scheme. This advanced exposure to audit procedures has proven invaluable in relation to the subsequent Federal Legislation that has been implemented since the development of the GGAS Scheme."

## D.5 Craig Bathie (formerly General Manager, Fieldforce Services Pty Ltd)

Fieldforce Services Pty Ltd (Fieldforce) had 6 accreditations under GGAS, from which it created over 9.4 million NGACs. These projects provided 'AAA' rated low-flow showerheads or flow restrictors and CFLs to residential and commercial energy users free of charge. In exchange for these appliances, the energy users were required to 'nominate' Fieldforce as the energy saver at their premises, thereby enabling it to create NGACs.

One of the compliance challenges with this type of project was keeping accurate records to ensure that no property was provided with the low-flow showerheads or CFLs more than once. To manage this, Fieldforce established a database with a nominated employee managing the auditing of record-keeping processes and accuracy of data recording, carrying out checks against the database of 100% of all nomination forms.

> "GGAS was the main driver for Fieldforce to transition from our traditional service delivery model of contracting directly with the energy and water authorities delivering demand management and retrofit programs, to going direct to market under our own brand and delivering energy saving retrofit services direct to the consumers (both residential and commercial).
>
> In addition to our own accreditation we also worked with Sydney Water and EnergyAustralia who were also accredited under GGAS. For both these clients we audited and retrofitted over 500,000 homes which were delivered to the customer at a lower cost in part due to the generation on NGACs.
>
> Our move into the scheme created a positive change for our business as it allowed us to expand our services without having to wait for the energy and water utilities to tender out contracts and hope to be awarded contract work. In doing so we could deliver a service which was unique to our brand at the time and control our own work volumes.
>
> The difficulties we experienced were:
>
> Moving from a service contract where we had fixed rates for supply of our revenue to where under GGAS we relied on revenue derived from the sale of the NGACs. The price of NGACs fluctuated based on supply and demand over the period of our accreditation and ranged from $13.50 down to approx. $4.00. We managed this risk through forward contracts with the energy retailers whereby we had fixed price forward contracts based on volume delivered over an agreed time period.
>
> Another issue we encountered was managing compliance. We increased our desktop auditing to 100%, increased our phone audit to 50% and increased our field audits. We had 12 staff working just on compliance in the office.
>
> The final difficultly we experienced was the external audits conducted by auditors approved by IPART. Because of the volume of certificates we were creating, we were continually audited by the external auditors, which ensured we maintained compliance but it did affect cash-flow. Each audit needed to be passed before we could create and sell the NGACs.

But overall the difficulties we experienced helped us streamline our processes and bolster our compliance which then assisted us on other projects around Australia. In total under Fieldforce's six accreditations we installed approximately 6.5 million CFLs and over 500,000 low flow showerheads."

## D.6 James Bulinski, Director, CO2 Australia Limited

"The GGAS was a major factor in CO2 Group Ltd's decision to develop a business around carbon project development and to explore a range of opportunities in the emerging carbon economy. Introduction of the GGAS represented a transformational step in the development of emissions reduction programs for Australia, and indeed internationally, as it established, for the first time, mandatory compliance obligations for emitters of greenhouse gas. Fundamentally, this created a market and value for carbon sequestration that allowed commercial companies like CO2 Group to develop large-scale businesses around greenhouse mitigation activities.

Under GGAS, it was possible to generate NGACs in relation to carbon sequestered within eligible forests and this activity was the focus for CO2 Group. In 2004, one of CO2 Group's wholly owned subsidiaries, CO2 Australia, became the first entity to successfully register a Carbon Sequestration – Forestry project under GGAS. Over subsequent years, sister subsidiaries Mallee Carbon Ltd and Blue-Leafed Mallee Ltd also registered projects. The establishment and management of these projects were variously funded by CO2 Group and NSW based energy producers seeking to offset their emissions.

From 2011, CO2 Group has been working to transition its GGAS projects, and all of the eligible forest areas registered under those projects, into the Carbon Farming Initiative (the CFI). This process is expected to be finalised during 2013.

Comment on the experience of participating in GGAS from CO2 Group representative:

The GGAS has been hugely influential on the conception, initiation and execution of CO2 Group's business model. Critically, GGAS provided an early Australian market for our offering, being carbon forest projects, and the demand for NGACs that it created allowed us to secure some pivotal contracts with large emitters that helped fund business growth. Operating under the GGAS provided us with some very valuable experience around the delivery of large, cost-effective carbon abatement projects. The carbon accounting procedures, record keeping processes and data management systems that we developed around our GGAS projects, as well as the operational and commercial experience we gained through being GGAS participants, will continue to deliver value for CO2 Group well into the future.

Key positive features of GGAS included:

- GGAS delivered genuine and substantial emissions reductions over a significant timeframe and, arguably, helped pave the way to broader national and international action on climate change.
- GGAS created a market for carbon sequestration and allowed commercial operators to establish businesses around greenhouse gas reduction activities.
- Turn-around on audit processes was generally prompt and responsive to commercial drivers, such as committed NGAC delivery timelines.

- There was some flexibility around carbon accounting methodology development, subject to a suitably rigorous audit process which ensured abatement was genuine and verifiable. This flexibility provided for ongoing innovation and improvement in carbon accounting processes.
- The inclusion of a 'discounting for uncertainty' approach, sometimes referred to as the '70% rule', which discounted carbon estimates based on the level of uncertainty around those estimates, created a very tangible commercial driver for reducing error and uncertainty in measurement processes.
- The assignment of 'case managers' to individual projects, allowing for a clear and efficient point of contact to discuss accredited project matters.

Areas that could have been improved include:

- Annual reporting templates could have been reviewed and improved over time so as to be better tailored to the information requirements for projects – at times the information requested seemed superfluous, or a double-up on previously reported information.
- While the clear nomination of individual staff members to work with proponents on projects was a positive, these individuals did change over time. While we consider this was useful to ensuring a wide base of expertise and the robustness of the review/audit processes, efficiency may have been improved where a more detailed hand-over was undertaken.

Beyond the above concerns, CO2 Group considers it unfortunate that the valuable learning and experiences gained through the GGAS do not seem to have been more broadly adopted within the design of the CFI. CO2 Group and its clients were also disappointed to effectively be commercially penalised for creating NGACs under NSWGGAS, which were subsequently not recognisable under the CFI. These issues may have been better dealt with where there was increased communication and collaboration between the Federal government, GGAS and project proponents.

Nevertheless, the GGAS must be seen as having been highly successful in its objectives of creating a market-place for carbon, incentivising improved emissions management and reducing greenhouse gas emissions. CO2 Group extends its congratulations to all involved in the delivery of these significant outcomes."