IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Compliance and Operation of the NSW Energy Savings Scheme during 2009

Report to Minister

NSW Energy Savings Scheme
July 2010

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Foreword

This report sets out the results of the first 6 months of operation of the NSW Energy Savings Scheme (ESS) which commenced operation on 1 July 2009.

The ESS is central to the NSW Government's Energy Efficiency Strategy and provides a market-based incentive to overcome market failures and barriers to delivering energy efficiency activities. Our role as Scheme Administrator and Scheme Regulator is to accredit companies to create Energy Savings Certificates (ESCs) and to manage the compliance of electricity retailers who are the liable parties in the scheme.

The ESS differs from similar schemes in other States by including the commercial and industrial sectors in addition to the residential sector. This expanded coverage of the ESS opens it to more diverse and potentially significant opportunities to reduce electricity consumption in NSW.

The ESS is a new scheme, but its framework and design is derived from the energy efficiency portion of the Greenhouse Gas Reduction Scheme (GGAS) which has operated for 7 years. Our experience with GGAS proved invaluable in setting up the ESS and many of the systems and procedures are based on GGAS.

Key milestones in establishing the ESS were:

- providing a smooth transition for eligible GGAS participants to the ESS (commenced in March 2009)
- establishing a stand-alone website for the ESS (July 2009)
- upgrading the GGAS Registry to include the ESS (July 2009)
- publishing the Exemptions Rule which sets out how to calculate exempt loads (September 2009)
- developing the framework documents for both applicants to the scheme, and for liable parties to meet their compliance obligations (December 2009).
- establishing a new ESS Audit Panel (February 2010)

At the end of 2009, 30 companies have become accredited to create ESCs through implementing 45 energy saving projects.

As with any new scheme, the initial months were ones of consolidation and establishing the framework for parties to participate in the scheme. Some participants were concerned whether enough certificates would be available for the first compliance period. In anticipation of a slow start to certificate creation, we delayed the compliance date for Scheme Participants (the electricity retailers) to allow additional time for accredited parties to create their certificates. This step also allowed additional time to establish the ESS Audit Panel, a key component of managing compliance in the scheme.

By the end of April 2009 when Scheme Participants were required to lodge their Annual Energy Savings Statements and surrender the required number of ESCs, close to the full number of certificates required to meet the overall energy savings target had been registered. This result more than satisfied demand for certificates, especially when the ability to carry forward a shortfall of 50% in the first year is taken into account. By the end of June 2010, the last date to register 2009 certificates, 278,176 ESCs were registered representing 262,430 MWh of energy savings in 2009.

Two of our key challenges will be to ensure the on-going integrity of the scheme and to reduce compliance costs.

One of the innovative areas of activity has been the door-to-door showerhead replacement programs. By the end of 2009 we had early indications that there was a significant risk of over-creation of ESCs under these programs. To address our concerns, we introduced several measures including increased information disclosure by the companies carrying out these activities, stricter and more extensive audits which incorporated phone surveys, and additional tests to verify the eligibility of the showerheads being replaced. In addition, we conducted a Newspoll survey which indicated an approaching market saturation for this activity. This led to the Minister for Energy calling for a review of this activity in the ESS.

We will be closely monitoring activities during 2010 to ensure that all certificate creation is valid, and that the scheme's integrity is maintained.

ESS projects tend to be smaller in scale and more dispersed than GGAS projects. For this reason we need to keep a close focus on the costs of participation. For example, we developed the commercial lighting tool to reduce the compliance costs for commercial lighting projects and will continue to explore similar opportunities within the scheme.

As the ESS moves into its second year of operation, we hope to see its continued growth, particularly in both the commercial and industrial sectors. We believe this is where there are large opportunities for savings. We will work with the policy makers to develop these initiatives and to help identify areas where we think the scheme can be expanded to continue achieving electricity savings in NSW.

James Cox
Chief Executive Officer and Full Time Member

1 Introduction and executive summary

This is the first report on the compliance and operation of the NSW Energy Savings Scheme (ESS) which commenced on 1 July 2009. As the ESS operates on a calendar year basis, this report covers the 6 months of its operation to 31 December 2009.

1.1 What is the ESS?

The ESS is established under Part 9 of the *Electricity Supply Act 1995* (the Act), which sets out the following objectives for the scheme:

- to assist households and businesses to reduce electricity consumption and electricity costs
- to complement any national scheme for carbon pollution reduction by making the reduction of greenhouse gas emissions achievable at a lower costs, and
- to reduce the cost of, and the need for, additional energy generation, transmission and distribution infrastructure.

The framework for the design of the ESS was taken directly from the Greenhouse Gas Reduction Scheme (GGAS), specifically the energy efficiency component governed by the *Greenhouse Gas Benchmark (Demand Side Abatement) Rule No. 3* (DSA Rule). Amendments were introduced to GGAS simultaneously to remove the eligibility of energy efficiency projects so that no overlap occurred between the schemes. The ESS is intended to be complementary but independent of the proposed (but deferred) Carbon Pollution Reduction Scheme (CPRS).

The Act sets annual energy savings targets that must be met by liable parties under the ESS through the surrender of energy savings certificates (ESCs). The targets are expressed as a percentage of annual liable electricity acquisitions by Scheme Participants, and increase each year until 2014 after which they remain steady until 2020. The energy savings target for 2009 is 1% of all liable acquisitions made during the compliance year. Since the ESS started in July 2009 the 1% target applies to liable acquisitions made from 1 July to 31 December 2009 and translates to approximately 0.5% of liable acquisitions for the entire 2009 calendar year. This is equivalent to 287,900 MWh of energy saved, or 305,174 ESCs.

1.2 Responsibility for administering and regulating the ESS

The Independent Pricing and Regulatory Tribunal of NSW (IPART) is both Scheme Administrator and Scheme Regulator of the ESS. As part of this role, we host the website for the ESS, which can be found at www.ess.nsw.gov.au. In addition, we track the creation, ownership and surrender of ESCs through the GGAS & ESS Registry which can be found at https://www.ggas-registry.nsw.gov.au.

Under the relevant provisions of the Act, IPART may, with the approval of the Minister, delegate the exercise of its functions as Scheme Administrator and Scheme Regulator to another person or body. We have chosen to delegate these functions to an ESS Committee. For the 2009 calendar year, this Committee comprised Mr James Cox as full-time IPART Member, and Dr Brian Spalding and Mr Eric Groom as Committee Members. The Committee first met on 18 August 2009, and met a total of 7 times in 2009.

The ESS was designed to recover its administrative costs over the life of the scheme through fees paid by participants. In 2009, IPART's costs of administering both ESS and GGAS schemes represented 2.2% of the total value of all certificates registered under both schemes during the year, based on an average spot price of $16.98 for ESS and $4.34 for GGAS during 2009. Included in this are the setup costs for establishing the ESS.

In developing the arrangements for participation in the ESS, Section 78M of the Regulation requires an application fee ($500) with the initial application for accreditation. However, all subsequent applications or amendments to projects by the Accredited Certificate Provider will not attract an application fee. This is intended to encourage as much participation in the ESS as possible, by minimising financial barriers to entry.

1.3 Performance of Scheme Participants in 2009

The main parties liable under the ESS are electricity retailers operating in NSW.[1] These parties are known as Scheme Participants. They are required to demonstrate that they have met their compliance obligations under the ESS (including their individual annual energy savings target) in Annual Energy Savings Statements (AESS), which they submit to IPART.

As the ESS did not commence until half-way through 2009, we extended the deadline for Scheme Participants to submit their 2009 AESS from 18 March until 29 April 2010. In addition, for this first year of the ESS, the Regulation makes provisions to allow them to carry forward an energy savings shortfall of up to 50% of their individual energy savings target to the 2010 compliance year instead of the 20% allowed under

[1] A small number are electricity generators that directly supply retail customers in NSW, or market customers who purchase electricity directly from the National Electricity Market.

the Act.[2] They are required to make up any shortfall they carry forward by the time they submit their 2010 AESS.

During the 2009 compliance year, there were 29 Scheme Participants, which together surrendered 148,928 ESCs. This represents around half the total number of ESCs required to meet their combined compliance obligations for the year. Of the 15 Scheme Participants that recorded an energy savings shortfall, 12 chose to carry forward this shortfall to 2010, one chose to pay the penalty associated with the shortfall, and 2 had the penalty waived[3].

Note that unlike GGAS, the ESS includes provisions that allow a portion of the Scheme Participants' electricity sales to be excluded in calculating their annual liable electricity acquisitions, from which their individual energy savings targets are calculated in MWh. In particular, a number of entities have been granted exemptions for part of their electricity load used in 'emissions intensive and trade exposed' industries or activities. These entities are set out in a Ministerial Order published by the Minister for Energy in the Government Gazette.[4] The Ministerial Order lists each exempt entity, the trade exposed activity, the specific location where the activity takes place, and the proportion of the load that is exempt under the ESS (either 60% or 90%). These entities must provide their electricity retailer with details of their exempt load in order to claim the exemption. The retailer may deduct this proportion of the load from its annual liable electricity acquisitions, and thus reduce its annual energy savings target (in MWh).

In 2009, 9 Scheme Participants supplied electricity to entities with exempt loads. These exempt loads comprised around 20% of the total electricity supplied in NSW during the 6-months the ESS was operating.

1.4 Performance of Accredited Certificate Providers in 2009

The parties that create ESCs and sell them to the Scheme Participants are known as Accredited Certificate Providers, and are voluntary participants in the ESS. They need to apply for accreditation in respect to specific energy savings projects which, once accredited, are known as Recognised Energy Savings Activities (RESAs).

An important principle in establishing the ESS was to allow eligible projects that were accredited under the DSA Rule of GGAS to transition into the ESS without any loss of entitlements. However, not all these projects did transition: some chose not to, and others involved activities that were no longer eligible under the ESS (eg, the replacement of incandescent light globes with compact fluorescent light globes). Of 72 potentially eligible GGAS accreditations, 28 had transitioned into the ESS by

2 The Act allows for changes to the allowable shortfall carry forward through amending the Regulation.

3 In both cases the shortfall was less than one ESC.

4 The most recent Ministerial Order was published on 18 December 2009.

31 December 2009, and a further 3 transitioned in early 2010 for activities carried out during 2009.

As the ESS covers the residential, commercial and industrial sectors of the economy, the scope for RESAs is broad. Those that apply for accreditation in respect to an energy saving project can do so in their own right for a project they have commissioned. Alternatively, they can assign the rights to create ESCs by nominating a third person to take responsibility for complying with the requirements of the ESS. The ability to nominate another party enables the ESS to capture a large pool of potential energy savings activities.

By the end of 2009, there were 32 RESAs accredited under the ESS and by 30 June 2010, an additional 13 RESAs were accredited to create 2009 ESCs.

To be accredited, these activities needed to meet the criteria for one of 3 broad methodologies for claiming energy savings. These methods are set out in *Energy Savings Scheme Rule No 1 of 2009* (ESS Rule), and include the Project Impact Assessment Method, the Metered Baseline Method, and the Deemed Energy Savings Method. These methods are similar to those included in the original DSA Rule. However, the Deemed Energy Savings Method includes several new sub-methods – the Commercial Lighting Formula and High Efficiency Motor Formula – and the Project Impact Assessment Method has been modified to expand and simplify it.

1.5 Auditing activities and findings in 2009

As under GGAS, the ability to require audits is an important tool for encouraging compliance under the ESS. To recognise the separation of the schemes and the unique character of the ESS, we established a separate ESS Audit Services Panel with its own set of eligibility requirements. Eight companies have joined this panel, many of whom were accredited to conduct audits under GGAS. We also released the ESS Audit Guideline, which explains how audits operate under the ESS. We plan to release the ESS Compliance and Performance Monitoring Strategy in 2010, which will set out our methodology for establishing audit regimes for projects and the means by which we manage compliance under the ESS.

Despite the comparative newness of the ESS, the audits conducted in respect of 2009 vintage certificate creation identified that the rapid growth of showerhead programs had led to instances of non-compliance. The showerhead programs created high volumes of certificates and so required large numbers of records to be verified. The instances of invalid certificate creation identified arose from the overstatement of installations carried out, claiming ESCs for ineligible hot water systems and/or where efficient showerheads have been replaced.

As Scheme Administrator, we place a high degree of importance on the integrity of energy savings claimed by Accredited Certificate Providers, especially on verifying those savings where the original energy saver is not the accredited party. Therefore, we have had to impose rigorous auditing regimes against showerhead replacement RESAs, including restricting from trade, by agreement, a certain proportion of ESCs created until third party assurance is received following an audit. While the majority of this activity occurred in early 2010, it arises from applications that were accredited in late 2009. In March 2010, we advised the relevant policy agencies of our concern about various aspects of the showerhead replacement RESAs, and in April the then Minister for Energy, the Honourable John Robertson MLC, requested a review of these types of programs in the ESS.

1.6 Key statistics on the creation of ESCs recorded in the Registry in 2009

As at 30 June 2010, the Registry had recorded the creation of 278,176 ESCs for the 2009 calendar year. Sixty five per cent of these were derived from companies that had successfully transitioned from GGAS to the ESS and were able to claim energy savings for the entire 6 months that the ESS was operating. Importantly, by the end of April 2010, when Scheme Participants were required to submit their AESSs for 2009, approximately 93% of the total number of 2009 vintage ESCs had been registered. This is an impressive achievement given the relatively short lead time available for companies to be accredited and then to create certificates.

1.7 Projected supply and demand of ESCs

ESC supply was extremely close to meeting actual demand in 2009, with the outlook for 2010 indicating that supply will exceed demand (even allowing for the 50% shortfall carried over by the majority of Scheme Participants in 2009). However the outlook for supply in 2011 will be somewhat tighter if applications currently on the books fail to be either accredited or meet the applicant's original ESC creation expectations. In particular, the outcome of the Ministerial Review of showerhead replacement related RESA activity may result in fewer ESCs being created than originally forecast.

Despite any reduction in ESC supply after 2010 from the residential sector, there is an expectation of continued steady growth in energy savings from the commercial and industrial sectors, as accredited (and proposed) RESA activity in these sectors is yet to be fully engaged.

1.8 What does the rest of this report cover?

The rest of this report discusses the operation of and compliance with the ESS during 2009 in detail:

- Chapter 2 outlines the work undertaken to develop the legislative and operating frameworks for the ESS prior to its commencement on 1 July
- Chapters 3 and 4 focus on the performance of the Scheme Participants and Accredited Certificate Providers
- Chapter 5 discusses auditing activities and findings
- Chapter 6 provides key statistics on the creation, surrender and transfer of ESCs recorded in the Registry, and
- Chapter 7 provides information about the demand for and supply of ESCs during 2009 and presents some possible scenarios for demand and supply in the coming years.

The appendices provide an overview of the ESS and its key elements, as well as detailed information on the ESCs created during 2009 and the estimated energy savings achieved through those activities.

2 Development of the ESS

In late 2008 the NSW Government announced its intention to "revitalise the energy efficiency component of the NSW Greenhouse Gas Reduction Scheme" by establishing a new energy efficiency scheme.[5] In doing so, the Government confirmed that energy efficiency savings targets would be part of the scheme, and would form a key plank of the NSW Energy Efficiency Strategy[6] to prepare NSW households and businesses for the introduction of the national CPRS.

The NSW Government recognised that market-based incentives for energy efficiency would continue to be needed after the commencement of the CPRS and until the establishment of a national energy efficiency trading scheme. In establishing the ESS and setting a NSW target for energy savings, the Government aims to address market barriers to energy savings projects that will not be addressed by a carbon price alone.

Considerable work went into developing the legislative and operating frameworks for the ESS prior to and in the months after its commencement in July 2009. The key steps involved in this process included:

- establishing appropriate annual energy savings targets and penalties
- identifying the cost-effective energy savings activities to deliver on this target and reliable methods for calculating the savings claimed
- introducing the necessary legislation
- launching the ESS and its website
- developing the many documents required to operationalise the ESS
- establishing an ESS Committee to act as Scheme Administrator and Scheme Regulator on behalf of IPART
- defining the emissions intensive and trade exposed entities and activities to be exempt from the ESS, and developing the Exemptions Rule
- developing the template for Annual Energy Savings Statements
- establishing the Audit Services Panel for the ESS, and
- upgrading the GGAS Registry to create the new GGAS & ESS Registry.

Each of these steps is outlined below.

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5 News Release by Carmel Tebbutt, MP, Deputy Premier and Minister for Climate Change and the Environment, 28 November 2008.

6 This strategy was released in June 2008.

2.1 Establishing appropriate annual energy savings targets and penalties

The NSW Government commissioned independent expert analysis and modelling[7] of the energy market to identify the availability and cost of energy savings opportunities in the NSW economy. This analysis estimated that savings equivalent to 4% of electricity sales could be delivered at a cost of less than $35 per MWh of savings. The modelling indicated that setting mandatory energy savings targets for energy retailers would also improve economic productivity and jobs in NSW.

Based on this work, the Government established mandatory annual energy savings targets for all electricity retailers licensed to operate in NSW. These annual targets start at 0.5% of each retailer's liable annual electricity sales in 2009, and increase gradually to reach 5.0% of liable annual sales in 2014 (see Table 2.1). The targets have been designed to achieve over 3,500 GWh of electricity savings per annum from 2014 onwards across the residential, commercial and industrial sectors.

Note that as a proportion of NSW electricity sales are exempt (see section 2.7 below), the 'effective' ESS targets are approximately 20% less than shown in this table. That is, the effective targets for the 6 months of the 2009 compliance year was around 0.4%, and the effective target from 2014 on will be around 4%.

Table 2.1 Annual ESS targets over life of the ESS

Year	ESS target (% of annual liable acquisitions)
2009[a]	0.5%
2010	1.5%
2011	2.5%
2012	3.5%
2013	4.5%
2014-2020	5.0%

[a] Half year from 1 July.

The Government established a penalty for electricity retailers that fail to meet their annual energy savings target. Before tax, the base penalty rate for 2009 is $24.50 per MWh of targeted savings not achieved.

2.2 Identifying activities for delivering on targets and methods for calculating energy savings claimed

During late 2008 and early 2009 IPART, along with the Department of Environment, Climate Change and Water and the Department of Industry and Investment,

7 See 'Better Regulation Statement' published by NSW Department of Water and Energy at www.industry.nsw.gov.au/energy/files/sustain_renew_neet_better_regulation_statement.pdf

undertook a process to identify the energy savings activities that should be included in the ESS. As the starting point, we reviewed the activities included in the DSA component of GGAS (which was used as the basis for designing the ESS Rule) to establish whether they were still considered appropriate and whether there were additional cost-effective activities that should be included in the ESS.

The Government also invited public submissions, and held a public workshop in April 2009. The workshop participants discussed the broad categories of energy savings opportunities available, and the options proposed for inclusion in the ESS. It was realised that some of the activities eligible under GGAS were no longer eligible because of market saturation or changes to minimum energy performance standards, and so should not be carried over into the ESS. Activities excluded were the installation of compact fluorescent light globes, removable water flow restrictors and on-site generation activities, although generation activities are still recognised under the residual DSA Rule in GGAS.

In addition, we undertook an extensive review to determine which of the existing methods and sub-methods for calculating the savings claimed by energy saving activities that should transition from GGAS into the ESS, and any new methods that should be added. The aim of this review was to ensure the currency and accuracy of the included methods.

One of the outcomes of this review was a range of modifications to the Project Impact Assessment Method, including:

- expanding and simplifying the allowance for forward creation of ESCs so that Accredited Certificate Providers using this method in the ESS are allowed to claim up to 5 years of energy savings up-front (compared to 3 years in the GGAS)
- establishing a more conservative approach to discounting so that, over the 5-year forward creation period, energy savings are discounted by 40% overall
- allowing Accredited Certificate Providers to 'top up' their claimed energy savings through audit verification, provided they maintain annual records over the 5-year period in order to verify any further claim for energy savings.

By building on the experience and work undertaken in administering GGAS, this work enabled the ESS to commence with a full suite of activities and energy savings calculation methods that had been 'tested' under GGAS and shown to be effective measures in achieving energy savings. (Note further information on the individual methods is provided in Chapter 4.)

2.3 Introducing the necessary legislation

The ESS was established in NSW through the *Electricity Supply Amendment Bill 2009* (the Bill) which was introduced in May 2009 and assented to on 19 June 2009. This amendment sets out the legal and technical framework of the ESS as well as the functions and responsibilities of Scheme Regulator and Scheme Administrator.

The Bill is supported by the *Electricity Supply (General) Regulation 2001* (the Regulation) which makes provision for aspects of the operation of the ESS. The Regulation provides further details of the ESS, such as:

- the assessment of compliance of Scheme Participants
- the eligibility requirements for accreditation as an Accredited Certificate Provider
- the conditions of accreditation that are imposed by the Scheme Administrator
- the creation and transfer of ESCs
- the conduct of audits
- the requirement to maintain a register of Accredited Certificate Providers and a register of ESC creation and ownership.

The Bill is also supported by the ESS Rule, which was issued by the Minister for Energy and gazetted on 3 July 2009. The ESS Rule provides additional eligibility requirements for Accredited Certificate Providers and the methods they must use to calculate the savings claimed from their activities. It sets out:

- the types of eligible and ineligible activities
- the requirements for eligible applicants
- detailed methods and sub-methods for calculating energy savings claimed
- the rules for the creation of ESCs.

As part of the development process, a draft ESS Rule was developed (based on the outcomes of the review discussed in section 2.2 above), and released for public consultation in late May 2009. After considering stakeholder responses, various terms and assumptions were clarified, and revisions made to some of the methods. The new ESS Rule contains an expanded range of activities for which deemed factors or formulae could be used.

The Department of Industry and Investment (formerly the Department of Water and Energy) has responsibility for policy development of the ESS and ultimate responsibility for any legislative changes introduced to the ESS.

2.4 Launching the ESS and its website

The ESS was launched on 1 July 2009. At the same time, IPART launched its website for the ESS. The website was developed using professional website designers in the months leading up to the commencement of the ESS. However, much of the content could not be added until passage of the Bill in Parliament which was assented to only 2 weeks before the scheme commenced.

2.5 Developing the necessary documents

We developed a total of 18 different documents and added them to the ESS website to inform the market and to allow interested parties to apply for accreditation. These included application forms for each of the 9 methods and sub-methods in the ESS Rule, along with accompanying guidance documents. They also included 6 fact sheets covering further technical detail relevant to the different methodologies.

2.6 Establishing the ESS Committee

Under relevant provisions of the Act, IPART may, with the approval of the Minister, delegate the exercise of its functions as Scheme Administrator and Scheme Regulator to another person or body. We chose to establish an ESS Committee and delegate these functions to this committee. For the 2009 calendar year, the ESS Committee comprised Mr James Cox as Full Time IPART Member, and Dr Brian Spalding and Mr Eric Groom as Committee Members.

The Committee meets on a regular basis and considers both applications for accreditation as Scheme Administrator, and any compliance matters as Scheme Regulator. In the initial months of the ESS's operation, the majority of decisions regarding accreditation involved assessing existing GGAS DSA accreditations to establish their ongoing eligibility under the ESS, and whether any new conditions of accreditation were required. As these accreditations transitioned from GGAS to the ESS, their former GGAS accreditations were cancelled once all obligations under that scheme were satisfied.

2.7 Defining the emissions intensive and trade exposed industries and activities and developing the Exemptions Rule

One of the key differences between GGAS and the ESS is that emissions intensive and trade exposed industries can be partially exempt from the ESS in line with the principles developed by the Commonwealth Government's approach under the expanded Renewable Energy Target.

Considerable work was required to define which industries and activities would qualify as emissions intensive and trade exposed for the purposes of the ESS. Because Commonwealth definitions were not available when the ESS was in

development, they could not be incorporated into the ESS legislation. Instead, the NSW Government identified exempted parties in a Ministerial Order, first published by the Minister for Energy in August 2009 then updated on 18 December 2009.

This Ministerial Order lists the companies, the exempt activities, the percentage of the exemption (either 60% or 90% of the electricity load associated with the exempt activity), and the specific locations where the exempt activities take place. These exemptions apply for the following calendar year (ie, 2010) and any changes will only take effect for the year after a new Ministerial Order is made.

Because IPART (as Scheme Regulator) does not have a direct relationship with the exempt parties in the ESS, we created the *ESS Exemptions Rule No 1 of 2009* (the Exemptions Rule) which sets out the manner in which Scheme Participants (the electricity retailers) calculate and claim deductions from the total value of their liable acquisitions in relation to exemptions. In developing this Rule, we consulted with the electricity retailers and the exempt parties to ensure the procedures could be easily followed and implemented. No significant issues were identified. We circulated the Exemptions Rule for comment in August 2009, and then finalised it at the end of September 2009.

2.8 Developing a template for Annual Energy Savings Statements

The Annual Energy Savings Statement (AESS) lodged by Scheme Participants in the ESS differs considerably from the Benchmark Statements submitted by liable parties under GGAS. Therefore, we developed a new template for the AESS. We had the draft template peer reviewed, and then trialled it with one of the electricity retailers to ensure the calculations were correct and the algorithms functioned properly. We published the finalised AESS template on the ESS website on 3 December 2009.

2.9 Establishing the ESS Audit Services Panel

The Regulation sets stringent auditing requirements to ensure Scheme Participants meet their energy savings targets and Accredited Certificate Providers undertake energy savings activities and create ESC in accordance with the ESS legislation. To help us (as Scheme Administrator and Scheme Regulator) meet these requirements, we established an ESS Services Panel between November 2009 and February 2010. We first called for expressions of interest to join the ESS Audit Services Panel in October 2009, then sent out formal application forms in late November 2009. We also made these forms available on the ESS website from that date. At the same time, we released a new Audit Services Panel Agreement.

Appointment to the ESS Audit Services Panel is open to firms that demonstrate knowledge and experience in conducting audits of energy efficiency projects. We released the ESS Audit Guideline (which is a compendium for use by auditors) and generic Audit Scopes for conducting audits in the ESS in early January 2010.

2.10 Upgrading the GGAS Registry to form the GGAS & ESS Registry

The Regulation also requires that the Scheme Administrator maintains a register of Accredited Certificate Providers and a register of ESC creation and ownership. To meet this requirement, we upgraded the GGAS Registry to incorporate the ESS Registry.

This involved significant changes to the GGAS Registry. While ESCs are quantified in tonnes of CO_2 equivalent, which is the same as NSW Greenhouse Abatement Certificates (NGACs) and Large User Abatement Certificates (LUACs) in GGAS, the certificates are not fungible between the schemes and need to be separately registered and reported.

The necessary modifications to the GGAS Registry were undertaken by the Registry's operators, Logica Pty Ltd, during the months prior to the commencement of the ESS. The changes were completed, tested, and the new GGAS & ESS Registry was launched on 4 July 2009 prior to the first registration of ESCs. The design of the Registry allows users to easily identify which Registry they are in when navigating the Registry.

We closely manage the Registry to ensure it continues to deliver a high standard of functionality and reporting for both the ESS and GGAS. We also work with Logica to ensure that the Registry is improved on a regular basis, and that upgrades and enhancements are delivered efficiently without any interruption to the service levels required.

3 Scheme Participants' compliance performance

Scheme Participants include all holders of NSW electricity retail licences, NSW electricity generators that supply directly to retail customers in NSW, and market customers in NSW who purchase their electricity directly from the National Electricity Market (NEM).

Each Scheme Participant is required to calculate its individual energy savings target for the year and obtain and surrender ESCs in order to meet its target.[8] If it does not surrender sufficient ESCs, it will have an energy savings shortfall and can choose to carry this shortfall forward to the following year (within the allowable limits) or be subject to a shortfall penalty.

Each Scheme Participant is also required to lodge an Annual Energy Savings Statement (AESS) for a calendar year with IPART (as Scheme Regulator) by no later than 18 March of the following year. (However, for the 2009 compliance year only, we extended the due date for lodgement of AESSs to 29 April 2010.[9]) The AESS must include the Scheme Participant's calculation of its individual target for the year, the extent to which it met that target by surrendering ESCs, any energy savings shortfall and any penalty it is required to pay. It must also include particulars of the Scheme Participant's liable acquisitions and deductions in respect of any partially exempt loads.

In the majority of cases, IPART requires the AESS to be accompanied by an independent audit report. However, Scheme Participants submitting nil returns complete a simplified AESS which does not require an audit. In addition, we granted audit exemptions for Scheme Participants that had very low electricity purchases for the year.

During the 2009 compliance year, there were 29 Scheme Participants – comprising 25 retail suppliers, 2 generators that supply directly to retail customers, and 2 market customers. One of these retail suppliers entered voluntary administration in 2009 and ceased to be a Scheme Participant. The sections below provide an overview of these Scheme Participants' compliance performance during 2009, then discuss their

8 A Scheme Participant's individual target is based on the size of its share of liable electricity acquisitions – ie, if the overall target is 1% of liable electricity acquisitions, and its share is 10% of these acquisitions, its individual target is 0.1% of these acquisitions.

9 The due date for lodgement of AESSs for the calendar years from 2010 onwards will revert to 18 March.

energy savings shortfalls, penalties for energy savings shortfalls and deductions for exempt loads in more detail.

3.1 Overview of Scheme Participants' compliance performance in 2009

Of the 29 Scheme Participants, 11 fully complied with their obligations under the ESS. Of these, 6 surrendered sufficient ESCs to meet their energy savings target, while a further 5 did not directly purchase or sell electricity in NSW and so were not required to surrender any ESCs. The other 15 had an energy savings shortfall, of which 12 of these chose to carry that shortfall forward to 2010 and 3 elected to pay a penalty. Of the 3 Scheme Participants that elected to pay a penalty, one paid the penalty in full, one paid a part penalty and had the remainder (of one ESC) wavied and one had their full penalty waived as the shortfall was less than one ESC. (See Table 3.2.)

Only one Scheme Participant failed to comply with any of its ESS obligations. This was the electricity retailer Jackgreen International Pty Ltd, which went into voluntary administration on 18 December 2009 and was suspended from trading on the NEM. At this time, we calculate that its liability under the ESS was 1,650 ESCs.

Across all Scheme Participants, a total of 289,118 ESCs were required to be surrendered to meet their compliance obligations for 2009 (Table 3.1). Approximately half this number were surrendered and accepted, leaving an energy savings shortfall equivalent to 139,843 ESCs. Most of this shortfall was carried forward to 2010, while the equivalent of 347 ESCs was paid in penalties. A shortfall of 1,650 ESCs remains outstanding (those for which Jackgreen was liable, as discussed above).

Table 3.1 Total ESCs required to be surrendered in 2009 compared to those actually surrendered

Total ESCs required to meet compliance obligations for the 2009 compliance year	289,118
Total ESCs surrendered	148,928
Total energy savings shortfalls carried forward to 2010 (expressed as ESCs)	139,843
Total penalties paid (expressed as ESCs)	347

Table 3.2 Scheme Participants' compliance for the 2009 compliance year

Compliance performance	Scheme Participant
Surrendered sufficient ESCs to meet 2009 energy savings targets	Aurora Energy Pty Ltd
	ERM Power Retail Pty Ltd
	Macquarie Generation[a]
	New South Wales Electricity Pty Ltd
	Red Energy Pty Ltd
	Tomago Aluminium Company Pty Ltd[b]
Did not directly purchase or sell electricity in NSW and therefore was not required to surrender ESCs	Actew AGL Retail Ltd
	BBPEnergy Markets Pty Ltd
	Dodo Power & Gas Ltd
	GridXPower Pty Ltd
	Tarong Energy Corporation Ltd
Had energy savings shortfall and chose to carry it forward to 2010	AGL Sales (Queensland Electricity) Pty Ltd
	AGL Sales Pty Ltd
	Australian Power & Gas Pty Ltd
	Country Energy
	Delta Electricity[a]
	Energy Australia
	Eraring Energy[b]
	Integral Energy
	Origin Energy Electricity Limited (including Cogent Energy and Sun Retail)[c]
	Powerdirect Pty Ltd
	TRUenergy Pty Ltd
	TRUenergy Yallourn Pty Ltd
Had energy savings shortfall and paid a penalty	Momentum Energy Pty Ltd
Had energy savings shortfall and paid a part penalty and had remainder wavied	Sanctuary Energy Pty Ltd
Had energy savings shortfall and had penalty waived	Independent Electricity Retail Solutions Pty Ltd
Had energy savings shortfall and did not pay penalty	Jackgreen International Pty Ltd

[a] A direct supplier of electricity.

[b] A market customer. Section 101(2) of the Act defines a market customer as: *market customer means a customer that has classified any of its electricity loads as a market load and that is registered with the Market Operator as a market customer under the National Electricity Rules (within the meaning of the National Electricity (NSW) Law)*.

[c] Origin Energy submitted a single AESS covering Origin Energy Electricity, Cogent Energy and Sun Retail.

3.2 Energy savings shortfalls

If a Scheme Participant fails to meet its individual energy savings target for a year, it has an energy savings shortfall for that year. Section 116 of the Act provides that such a participant can elect to carry forward at least some of this energy savings shortfall to the next year.

Under the legislation, the maximum amount of an energy savings shortfall that may be carried forward is equivalent to 20% of the Scheme Participant's individual energy savings target in 2009 and 10% of the Scheme Participant's individual energy savings target for all following years. However, because the 2009 compliance year was the first year of the ESS, the 20% maximum amount was increased to 50% of a Scheme Participant's individual energy savings target for this year only[10]. Any shortfall carried forward must be met the following year.

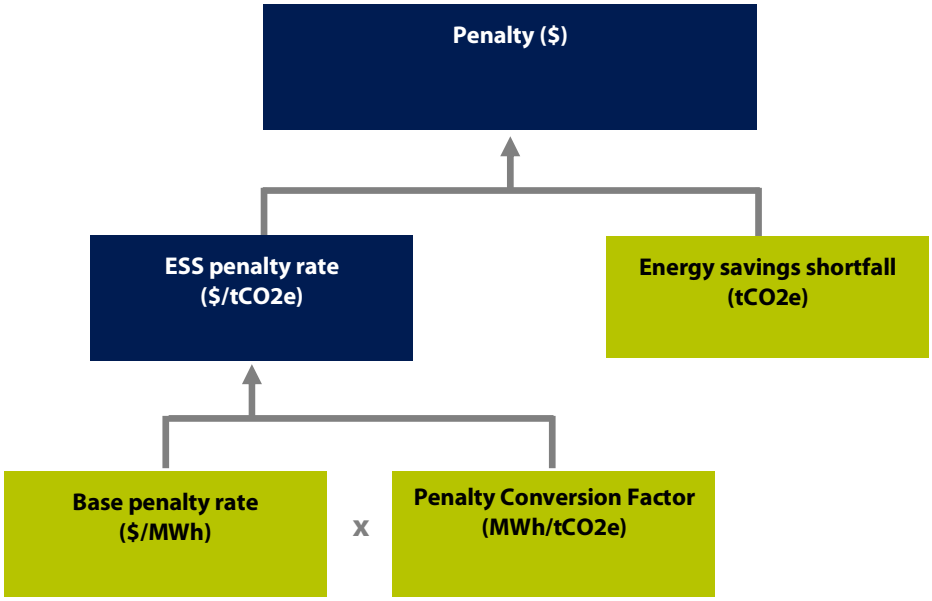
As noted in Section 3.1 above, for the 2009 compliance year, 12 Scheme Participants elected to carry forward a total of 139,843 ESCs to the 2010 compliance year. This equates to 48.4% of the total compliance obligation for 2009 across all Scheme Participants. The high proportion of companies carrying forward a shortfall to 2010 is not unexpected given that the ESS commenced in July 2009 and the ESC market is still developing.

3.3 Penalties for energy savings shortfalls

Section 112 of the Act provides that a Scheme Participant that has an energy savings shortfall for a year is liable to pay a penalty in respect of that year. The base penalty rate for the 2009 compliance year is $24.50 per MWh of shortfall. The penalty amount in dollars is calculated by multiplying the amount of the energy savings shortfall by the penalty conversion factor (0.94) and the base penalty rate[11]. This converts dollars per MWh into dollars per tonnes of CO_2 equivalent, which is the unit of measurement for determining the energy savings shortfall. This calculation is illustrated in Figure 3.1.

10 78K of the Regulation allowed for a maximum carry forward of 50% for 2009 only.
11 Base penalty rates and penalty conversion factors are set out in Schedule 5A of the Act.

Figure 3.1 Calculating the penalty associated with an energy savings shortfall



As noted above, 3 Scheme Participants elected to pay a penalty in respect of their energy savings shortfalls, but in 2 of these cases the penalty was wavied because a part penalty shortfall exceeding the allowable 50% equated to ½ an ESC. In the first case this meant no penalty was paid, in the second case the penalty payment was reduced by the value of 1 ESC. Table 3.3 shows the size of these penalties in ESCs and dollars.

Table 3.3 Scheme Participants that chose to pay penalties in 2009, and size of these penalties

Scheme Participant	Energy savings shortfall (ESCs)	Penalty ($)
Independent Electricity Retail Solutions	1	$23.00
Momentum Energy Pty Ltd	330	$7,599.00
Sanctuary Energy	16	$368.00

Also as noted above, Jackgreen International was liable for an estimated 1,650 ESCs at the time it entered voluntary administration. This corresponds to a financial penalty of $37,999 based on the 2009 penalty calculation outlined above. We provided this information to Jackgreen International's administrators in early 2010, and sent a further Notice of Assessment to the administrators following the end of the compliance period. At the time of writing, we had not received payment for this penalty.

3.4 Exempt loads

During the 2009 compliance year, 29 entities were granted exemptions for either 60% or 90% of their load at specified locations where they undertake emissions intensive and trade exposed activities. These entities and locations are listed in a Ministerial Order.[12] They include:

- Ten locations granted exemptions for 60% of their load. The activities undertaken at these locations include petroleum refining, and the production of glass containers, coke, chlorine gas, sodium hydroxide, ammonium nitrate, ethylene/polyethylene, and ethanol and hydrogen peroxide.
- Nineteen locations granted exemptions for 90% of their load. The activities undertaken include paper, newsprint and packaging manufacturing, lime and clinker production, steel making, carbon black production, flat glass production and aluminium smelting.

Nine Scheme Participants supplied electricity to entities with exempt loads. In total, the exempt loads comprised approximately 20% of the total electricity supplied in NSW in the 2009 compliance period.

See Section A.6 for further information on the Ministerial Order and the Exemptions Rule.

12 The most recent Ministerial Order was published in the Government Gazette on 18 December 2009 and applied from the commencement of the ESS on 1 July 2009 until 31 December 2010.

4 Accredited Certificate Providers' performance

Accredited Certificate Providers are voluntary participants in the ESS. They apply for ESS accreditation in respect of eligible Recognised Energy Savings Activities (RESAs) (see Box 4.1 for more information). Once accredited, they can create ESCs from implementing these RESAs. One ESC represents the energy savings associated with the abatement of 1 tonne of carbon dioxide equivalent (tCO2-e).

To become an Accredited Certificate Provider, an entity must apply to IPART (as Scheme Administrator) for ESS accreditation. Their application must demonstrate that they and their proposed RESA fully meet the criteria for accreditation according to the Act, Regulation and ESS Rule. Once accredited, they are subject to a number of conditions of accreditation which outline their ongoing compliance responsibilities.

An Accredited Certificate Provider's RESA may be accredited to operate in multiple sectors (eg, to provide lighting upgrades in both the commercial and industrial sectors), or to undertake different but related activities in one sector (eg, to purchase high-efficiency refrigerators, and destroy refrigerators built before 1996 in the residential sector). But where this is the case, they are considered to be separate RESA projects (even though there is only one accreditation). The Accredited Certificate Provider is required to register the ESCs created by each individual project covered by the accreditation, and these are tracked separately in the Registry.

To encourage the development of the ESC market, we allowed Accredited Certificate Providers previously accredited under the energy efficiency component of the GGAS Demand Side Abatement Rule to transition their accreditation to the ESS, subject to our being satisfied that their ongoing energy saving activity meets all the ESS requirements. As a result of this, many of the RESAs accredited for 2009 pre-date the 1 July 2008 eligibility requirement.

For this compliance year, there were 30 Accredited Certificate Providers, with 45 RESAs accredited to create ESCs of 2009 vintage in respect of 60 projects. Of these accredited RESAs, 31 transitioned from GGAS and 14 were new activities. The sections below discuss these RESAs and projects in more detail and the compliance performance of Accredited Certificate Providers.

Box 4.1 What are Recognised Energy Savings Activities?

RESAs are specific activities implemented by an Accredited Certificate Provider that increase the efficiency of electricity consumption, or reduce electricity consumption, without negative effects on production or service levels, by:

- modifying end-user equipment or usage of end-user equipment (including installing additional components)
- replacing end-user equipment with other end-user equipment that consume less electricity
- installing new end-user equipment that consumes less electricity than other end-user equipment of the same type, function, output or service, or
- removing end-user equipment that results in reduced electricity consumption, where there is no negative effect on production or service levels.

4.1 Recognised energy savings activities accredited to create ESCs for 2009

Table 4.1 shows the number of RESAs and projects accredited to create ESCs for the 2009 compliance year, by the year in which they were accredited and the method they used to calculate the energy savings claimed. The RESAs and projects accredited in 2010 include those where the application was lodged prior to 31 December 2009, but not approved till early 2010. These RESAs were allowed to claim 2009 vintage ESCs which assisted with transition from GGAS to the ESS and helped to establish sufficient activity in the ESS for 2009 compliance.

The methods used to calculate the energy savings claimed include the 3 broad methods set out in the ESS Rule: the Project Impact Assessment Method, the Metered Baseline Method, and the Deemed Energy Savings Method. To be accredited, a RESA needs to meet the criteria for one these broad methods, or one of its sub-methods. If it does not, the applicant needs to modify the proposed project so that it does, or apply to have a new methodology incorporated into the ESS Rule.

Table 4.1 indicates that the Project Impact Assessment Method and the Default Savings Factors sub-method within the Deemed Energy Savings Method are the 2 most prevalent methods used to date. Both these methods are simple to apply, and make use of deeming energy savings at the time of certificate registration, with consequential discounting of those savings. Neither requires technical monitoring and ongoing measurements to determine energy savings which is also an advantage.

Few of the RESAs accredited to date used the Metered Baseline Method, or the other sub-methods of the Deemed Energy Savings Method to claim savings. These methods are more technically complex and are primarily suited to capital-intensive energy efficiency projects in the commercial and industrial sectors.

Table 4.1 RESAs and projects accredited by year accredited and energy savings calculation method

	2009[a] RESAs	2009[a] projects	2010[b] RESAs	2010[b] projects
Project Impact Assessment Method	**15**	**15**	**7**	**14**
Metered Baseline Method				
Baseline per unit of output	4	4	1	1
Baseline unaffected by output	1	1	0	0
Normalised baselines	0	0	0	0
Normalised by NABERS scheme	0	0	1	1
Total Metered Baseline Method	**5**	**5**	**2**	**2**
Deemed Energy Savings Method				
Default Savings Factors	9	16	1	1
Commercial Lighting Formula	2	2	2	2
High Efficiency Motor Formula	0	0	0	0
Power Factor Correction Energy Savings Formula	1	2	1	1
Total Deemed Energy Savings Method	**12**	**20**	**4**	**4**
Total RESAs accredited	**32**	**40**	**13**	**20**

a For the period 1 July to 31 December 2009.

b Applications accredited in the first half of 2010 that can claim 2009 vintage ESCs.

The sections below provide more information on each of the 3 broad methods and their sub-methods, and the process for incorporating a new methodology into the ESS Rule.

4.1.1 Project Impact Assessment Method

The Project Impact Assessment Method calculates savings from one-off energy savings projects. This method is most appropriate when:

- energy savings are small compared to the site's consumption
- baseline energy consumption data for the site is unavailable, or
- the variation in the baseline energy consumption due to other factors is high.

The energy savings can be determined by various means, including by direct measurement or by an engineering assessment. The Project Impact Assessment Method applies a confidence factor which reflects the accuracy and/or reliability of the data used to calculate energy savings.

One of the advantages of the Project Impact Assessment Method is that it is possible to make an up-front assessment of estimated future savings (known as forward creation of ESCs). This is considered to be an incentive where projects achieve small annual savings that might be insufficient to warrant accreditation under the ESS.

The ESS Rule allows the forward creation of up to 5 years of ESCs from a RESA that has ongoing energy savings as soon as the RESA is commenced. However, discount factors will apply to any forward creation (see Table 4.2).

Table 4.2 Discount factors for calculating forward creation of ESCs under the Project Impact Assessment Method

Year	Discount factor
1	1.00
2	0.80
3	0.60
4	0.40
5	0.20

Source: Schedule 5, Table 16 of the ESS Rule.

The ESS Rule also allows Accredited Certificate Providers who use the forward creation provisions under the Project Impact Assessment Method to revisit the savings claimed at the end of the 5-year period and to 'top up' the savings if a greater level of savings can be verified. But to do this, they need to have maintained adequate records so that any additional savings claimed can be validated by an audit of the project.

Boxes 4.2 and 4.3 below provide some examples of projects that used the Project Impact Assessment Method to calculate the energy savings claimed.

Box 4.2 Case study 1: Out Performers' Diageo Huntingwood Refrigeration Efficiency project

Out Performers is an industrial energy savings aggregator, accredited under the ESS for a number of different RESAs, under various methods of the Rule. In this capacity, Out Performers have been able to establish themselves as a service provider, and to form partnerships with industry to facilitate the creation of ESCs from complex industrial energy savings projects.

As an example, Out Performers was accredited to create ESCs from reductions in energy use associated with an upgrade of the refrigeration system at Diageo's Huntingwood beverage plant in western Sydney.

Engineering calculations were used to establish the energy savings resulting from the installation of variable speed drives and a new heat exchanger, which increased the overall 'coefficient of performance' of the refrigeration system.

Using the Project Impact Assessment Method from the Rule, Out Performers was able to calculate the number of ESCs attributable to those energy savings measures, and to 'forward create' those energy savings upfront for a 5-year period, at a discounted rate.

This arrangement requires that Diageo, who pay for the electricity at the site, nominate Out Performers to create and register ESCs on their behalf, and to bear the compliance risk associated with that creation.

Box 4.3 Case study 2: Norske Skog's Deckers Feed Pump Bypass project

Norske Skog Paper Mills (Australia) Limited's GGAS accreditation of the Deckers Feed Pump Bypass project at the Albury paper mill successfully transitioned into the ESS. The project used the Project Impact Assessment Method to calculate ESCs and was the first project to create ESCs.

The Deckers Feed Pump Bypass project modified Norske Skog's existing systems at the Albury paper mill through the installation of a bypass piping that allows the direct movement of paper pulp between production processes. This allowed Norske Skog to decommission a storage pump which had previously been consuming electricity on a continuous basis reducing electricity consumption by approximately 4,205MWh each year.

Norske Skog recognises the benefits of participating in the ESS and is keen to identify other projects which optimise their energy use and build on the savings already achieved from the current project.

4.1.2 Metered Baseline Method

The Metered Baseline Method involves measuring the electricity consumption before the RESA commences to establish a baseline electricity consumption standard for the site, and then measuring this consumption again after the RESA has commenced to establish new levels of electricity consumption. The difference between these measurements represents the impact of the RESA (assuming that the remainder of the site continues to operate as it did before the RESA commenced). This idea of 'before' and 'after' measurements is fundamental to the design of the ESS as the recognition of energy savings is based on being able to confirm savings against a baseline.

The Metered Baseline Method comprises 4 sub-methods for measuring consumption. Which of these is most appropriate depends on the nature of the project. These methods include the baseline per unit of output, baseline unaffected by output, normalised baseline and National Australian Built Environment Rating System (NABERS) methods.

Baseline per unit of output method

This method is most appropriate where consumption is strongly linked to output (eg, aluminium smelting). This method is usually used if:

- the consumption of all energy sources for the site are linear functions of output (that is they directly reflect each other)
- where the energy consumption that is fixed (that is, the proportion of energy consumed at the site does not vary with variations in output), can be measured or estimated, and
- output has not changed by more than 50% from the average output over the period that the baseline was measured.

Box 4.4 provides an example of a project that uses the baseline per unit of output sub-method of the Metered Baseline Method.

Box 4.4 Case Study 3: Orica's Botany Chlorine Plant Upgrade project

Orica upgraded its Botany chlorine production plant by replacing the original mercury cell technology with membrane-based Chlor-Alkali technology. The Chlor-Alkali technology is significantly more energy efficient, resulting in a reduction in energy consumption of 25% to 30% per tonne of chlorine production. The energy intensity of chlorine production combined with the volumes produced by Orica's Botany plant resulted in a significant level of annual energy savings associated with the upgrade.

Because of the strong link between electricity consumption and production from the plant, the metered baseline per unit of output method was chosen as the most suitable of the metered baseline methods available under the ESS Rule. Using this method, the number of ESCs produced each year in respect of the plant upgrade is calculated by applying the annual volume of chlorine production to the difference between the baseline energy intensity of the original mercury cell plant and the new Chlor-Alkali plant.

Baseline unaffected by output method

This method is most appropriate where energy consumption is not linked to output (eg, schools and swimming pools).

Normalised baseline method

This method is most appropriate where the baseline needs to be normalised to remove explainable variation from the baseline. Examples may include changes to ambient conditions or input characteristics.

National Australian Built Environment Rating System baseline method

The NABERS method is based on the normalised baseline approach and consists of 2 methods which are Method 4a for existing NABERS buildings and Method 4b for new NABERS buildings. These methods are used for normalising baseline energy consumption of offices, hotels and shopping centre buildings which use the NABERS Method for measuring building energy performance.

NABERS ratings (administered by the NSW Department of Environment, Climate Change and Water) are star based, with more stars indicating a higher level of energy-efficiency. The number of buildings with NABERS ratings is expected to increase significantly due to the introduction of the national Building Energy Efficiency Disclosure (BEED) Scheme before the end of 2010. As part of the BEED Scheme, building owners or lessors seeking to sell or lease any commercial office space with a net lettable area of 2,000m² or more will be required to have and to disclose to interested parties a current NABERS energy rating for the building.

4.1.3 Deemed Energy Savings Method

The Deemed Energy Savings Method is used for the installation of common end-user equipment, such as refrigerators and more energy efficient lighting. The method comprises 4 sub-methods, which provide robust and easy-to-use equations and factors for specific activities and/or equipment to calculate the energy savings/number of ESCs claimed. The method allows ESCs to be claimed at the time of implementation of the energy savings activity, for the energy savings that will occur over the deemed lifetime for the activity.

As part of the calculation methodology of each sub-method, there are assumed deeming periods for different activities. The Scheme Administrator also takes account of these deeming periods when determining actual annual energy savings from accredited RESAs.

Table 4.3 shows the deeming periods for some of the common activities/equipment. The sections below outline the 4 sub-methods: default savings factors, commercial lighting energy savings formula, high-efficiency motor energy savings formula, and power factor correction energy savings formula.

Table 4.3 Deeming periods for certain activities and/or equipment under the Deemed Energy Savings Method

Activity and/or end-user equipment	Deeming period
Replacement of 50W ELV halogen lamp with 35W ELV halogen lamp	4,000-10,000 hours
Replacement of 50W ELV halogen lamp and magnetic transformer with 35W ELV halogen lamp and electronic transformer – Residential & Commercial	4,000-10,000 hours
Replacement of a 50W halogen ELV lamp and transformer with a CFL, CCFL, LED or CMH, which has a Lamp Life of ≥ 10,000 hours	10,000 hours
Shower rose replacement	7 years
Purchase of a new high efficiency Clothes Washer	12 years
Purchase of a new high efficiency Dishwasher	16 years
Destruction of refrigerator or freezer built before 1996	7 years
Purchase of a new high efficiency Refrigerator	16 years
Purchase of a new high efficiency Freezer	20 years
Upgrade of commercial lighting, where the upgrade cannot be easily 'reversed': Other lighting	10 years
Upgrade of commercial lighting, where the upgrade cannot be easily 'reversed': Road lighting	12 years
Installation of high efficiency motor	12-25 years
Power factor correction equipment	10 years

Default savings factors

The default savings factors sub-method is used for projects that involve the installation or supply of end-user equipment types listed in Tables 1 to 8 of Schedule A of the ESS Rule. This includes the replacement of halogen down-lights with energy efficient alternatives; the sale or purchase of energy efficient clothes washers, dishwashers, fridges or freezers; the retirement of old spare fridges and freezers; and the installation of energy efficient shower roses. It does not include the installation of compact fluorescent light globes or water flow restrictors.

Commercial lighting energy savings formula

This sub-method is used for projects that only involve energy savings attributable to commercial lighting upgrades.

An electronic Commercial Lighting Calculation Tool is available on the ESS website for persons to calculate the number of ESCs they may create from a commercial lighting upgrade. The tool sets out the correct factors and discounts applicable for all eligible types of commercial lighting installations. As new technologies become available, both the ESS Rule and this tool will be updated to take account of new developments.

The advantage of the Commercial Lighting Calculation Tool is that it simplifies the calculation of energy savings and ESC creation that may be achieved from a lighting upgrade. An applicant can easily determine whether a project is eligible, and whether participation in the ESS is warranted.

Boxes 4.5 and 4.6 provide some examples of projects that have used the commercial lighting energy savings formula sub-method of the Deemed Energy Savings Method.

Box 4.5 Case study 4: AGL's Commercial Lighting Replacement Project

AGL has undertaken a program of energy efficiency upgrades for Centrelink across the organisation's portfolio of properties. Lighting upgrades implemented in Centrelink's NSW offices after 1 July 2008 have been recognised under the ESS, and ESCs have been created in respect of the energy savings eligible under the commercial lighting energy savings formula.

AGL intends to expand the program of lighting upgrades and to use the revenue generated through the creation of ESCs to provide an additional incentive for AGL's other clients to undertake upgrades of their commercial lighting installations.

Box 4.6 Case study 5: RTA's traffic light globe replacement project

The NSW Roads and Traffic Authority (RTA) had replaced all incandescent lamps with LED and quartz halogen lamps before 2009. Now the RTA will be progressively replacing the quartz halogen traffic light lamps with LED lamps in its approximately 2,500 traffic lights across NSW.

The commercial lighting energy savings formula makes specific provision for the calculation of energy savings from traffic light lamp replacements, and the RTA is accredited to create ESCs in respect of the energy saving achieved by such replacements.

The RTA's participation in the ESS provides it with an income stream which it intends to re-invest in the replacement program, increasing the total energy savings over what would otherwise have been the case in the absence of the ESS.

High efficiency motor energy savings formula

This sub-method is used for projects that only involve energy savings attributable to the sale or installation of one or more high efficiency motors. Table 12 of the ESS Rule contains an extensive list of default load utilisation factors for high efficiency motors where the end-user equipment and end-use are known. The load utilisation factors are divided into different categories depending on the end-use industry sector (eg agriculture, mining, construction etc).

Table 13 in the ESS Rule lists a number of default load utilisation factors where the end-user equipment and end-use are not known, and consequently is based on rated output in kW for different sizes of high efficiency motors.

Power factor correction energy savings formula

This sub-method is used for projects that only involve energy savings attributable to the reduced losses from the installation of Power Factor Correction (PFC) equipment.

The Electricity Service and Installation Rules of NSW[13] require the power factor of a site to be a minimum of 0.9 lagging. As such, ESCs can be generated only by the implementation of PFC which increases the power factor of a site above 0.9 to a maximum of 0.98.

4.1.4 Process of incorporating new methods into the ESS Rule

As noted above, if a RESA or RESA project is unable to satisfy the criteria in one of the 3 methods listed in the ESS Rule, then the applicant can either modify its project, if possible, or apply to have a new methodology incorporated into the ESS Rule.

13 www.industry.nsw.gov.au/energy/electricity/network-connections/rules

For parties seeking to have new methodologies included in the ESS Rule, guidelines have been developed for the process that should be followed in making a request. This information is available from the Department of Environment Climate Change and Water, which has responsibility for investigating areas to develop and expand the ESS Rule. Changes to the ESS Rule, including the addition of new methodologies, are the responsibility of the Department of Industry and Investment and require approval by the Minister for Energy.

In the first 6 months of operation of the ESS, there were no ESS Rule changes introduced. However, investigations by DECCW have identified the opportunity to add some new technologies, the need to update some of the factors, and a small number of changes which will require the amendment of the ESS Rule in 2010.

4.2 Accredited Certificate Providers compliance performance in 2009

All Accredited Certificate Providers are responsible for complying with a number of conditions of accreditation. These include, but are not limited to, that they submit annual report statements, undertake annual, periodic or 'spot' audits of their RESAs (as prescribed), and notify the Scheme Administrator of any changes to their accredited RESA. Failure to comply with any of these conditions may result in suspension or cancellation of their accreditation.

The 2009 compliance period was the start-up phase for the ESS and of the projects accredited, 278,176 of the ESCs registered during this period were 2009 vintage certificates. Because of this, only one Accredited Certificate Provider was required to undertake an audit, and no Accredited Certificate Providers were required to submit an annual report statement in this 6-month period. Nor did any Accredited Certificate Providers identify any material changes to their accredited RESAs during this period. Hence there were no accreditation compliance related issues identified in 2009.

However, one issue that arose early in 2010 was the need for greater scrutiny of shower rose replacement RESAs. During 2009, we accredited 3 of these RESAs, and agreed to the transition of 3 more from GGAS. In most cases, the companies accredited in respect of these projects did not fully commence operations until the end of 2009. In early 2010, we identified a number of areas in relation to shower rose replacement RESAs where additional measures were required to maintain the integrity of the ESS.

We explained these measures in the ESS Notice 01/2010 - *Additional information requirements for shower rose replacement programs*, published on the ESS website on 24 March 2010.[14] We also amended conditions of accreditation for these types of projects to include a range of measures, including (but not limited to) that Accredited Certificate Providers are to:

- Provide an extract from their installation database at the end of each quarter (in a format advised by the Scheme Administrator), and as required by the Scheme Administrator.
- Provide an electronic copy of the register of installers at the end of every month.
- Notify the Scheme Administrator of any changes to the accredited RESA.
- Notify the Scheme Administrator of any proposed changes to the end-user equipment (ie, showerhead specifications).
- Have an audit following the creation of 10,000 ESCs, with the audit to include a phone survey to confirm claims for ESC creation based on the actual activity carried out at the premises and a check of the key eligibility requirements for the claim. If the audit returned a material error rate of invalid certificate creation, then that error rate is to be applied across the total certificate creation population, and the Accredited Certificate Provider is required to voluntarily forfeit the equivalent number of certificates.
- Wait until after they are notified by the Scheme Administrator that it is satisfied with the outcome of the audit to create further ESCs.

The implementation of the above requirements and monitoring of compliance of all matters related to shower rose replacement RESAs pose challenges for the Scheme Administrator, and we intend to consider how best to meet these challenges during 2010.

14 www.ess.nsw.gov.au/documents/syn18.asp

5 Audit activities

The ESS legislation provides IPART with wide auditing powers to assist us in fulfilling the functions of Scheme Administrator and Scheme Regulator. For example, to ensure the integrity of the ESS is maintained, we are empowered to impose audit requirements on ESS participants and to use those audits to ensure that:

- Scheme Participants are meeting their individual energy savings targets, and
- Accredited Certificate Providers are accredited, and are creating ESCs in accordance with the Act, Regulation and the ESS Rule.

To assist us and ESS participants in meeting these audit requirements, we established a panel of eligible independent third party auditors, known as the ESS Audit Services Panel. The section below provides information on this panel. The subsequent sections discuss the audit requirements placed on Scheme Participants and Accredited Certificate Providers, and outline our audit activity in 2009.

5.1 ESS Audit Services Panel

All ESS audits must be undertaken by a member of the Audit Services Panel with IPART (acting as either the Scheme Administrator or Scheme Regulator) as the principal client. All audits are paid for by ESS participants (Accredited Certificate Providers or Scheme Participants).

Audit firms are eligible to apply to be members of this panel at any time. We assess applications against specific selection criteria to ensure that each firm on the panel has both the institutional capacity to support the audit process, and appropriate lead auditors with demonstrated skills and experience required to conduct reasonable assurance audits under the ESS.[15]

Panel members provide services in accordance with an Audit Services Panel Agreement (Panel Agreement). In addition to auditing, they may provide advice or consultancy services to Accredited Certificate Providers or to IPART under the Panel Agreement where no conflict of interest exists.

[15] A Panel Application Form and a Guide to Applying are available from the Scheme website at www.ess.nsw.gov.au/compliance_audit/compliance_audit.asp

As at May 2010, 8 firms with a total of 20 lead auditors were appointed to the Audit Services Panel. A list of the Audit Services Panel is available on the ESS website.[16]

5.2 Scheme Participant audits

Scheme Participants are required to lodge an audited Annual Energy Savings Statement (AESS) with us (as the Scheme Regulator) each year in respect of the previous year's compliance period. To date, we have adopted a stringent approach to AESS audits, requiring that all Scheme Participants have their AESS audited prior to submission, with exemptions being considered on a case-by-case basis. We have adopted this approach to increase the probability that Scheme Participants meet the energy savings targets established by the legislation.

AESS audits for the 2009 year compliance period were conducted in March and April 2010. These audits were carried out after the end of the calendar year, as they are required to capture all electricity sales or purchases made by Scheme Participants for the compliance period, and this information is not always available immediately following the end of the year.

5.3 Accredited Certificate Provider audits

When we accredit an Accredited Certificate Provider to carry out an eligible RESA, we impose audit requirements on them as part of the conditions of their accreditation. The required audits may be for one or more of the following purposes:

- to assess the eligibility for accreditation of an applicant, or a proposed change to the calculation methodology of an existing accreditation
- to establish compliance with the requirements of the Act, Regulation and Rules governing creation of ESCs, and
- to confirm the level of compliance with any conditions of accreditation.

Our decisions to impose audit requirements are based on risk assessments that have regard to the nature of the RESA and the value of certificates to be created annually.

As Chapter 4 noted, only one Accredited Certificate Provider was required to undertake an audit in 2009, as this period was the start-up period for the ESS and for the majority of accredited projects.

16 www.ess.nsw.gov.au/compliance_audit/compliance_audit.asp#AuditPanelMembers

5.4 Audit activity

For 2009, 14 AESS audits were undertaken, and these audits covered 16 Scheme Participants' AESSs. This was because we bundled audits together across company portfolios wherever possible, to minimise costs. For example, the audit of Origin Energy's AESS included an audit of both Cogent Energy and Sun Retail's compliance obligations.

These audits aimed to confirm the inputs provided by Scheme Participants when reporting their liable energy acquisitions and any claimed exempt loads. Primarily, they involved the auditor checking the calculations and, if they were confirmed, signing off on the number of certificates to be surrendered for compliance.

One audit of a RESA was undertaken as part of the compliance regime listed in the accreditation conditions of an Accredited Certificate Provider's RESA. In this case the audit scope covered ESC creation and record keeping arrangements.

Table 5.1 provides summary data on audit activity in 2009.

Table 5.1 Audit activity

	2009
AESS audits[a]	
Number of audits	14
Number of AESSs covered	16
RESA audits	
Number of audits	1
Number of RESAs covered	1
Total number of audits	**15**
Total AESSs or RESAs covered	**17**

[a] Conducted in the first quarter of the year covering compliance for the previous calendar year.

6 Registry statistics

The Regulation requires IPART, as Scheme Administrator, to maintain a register of Accredited Certificate Providers and of ESC creation and ownership. As Chapter 2 discussed, we created this ESS Registry by upgrading the GGAS Registry so it also supports the ESS.

This registry, known as the GGAS & ESS Registry (the Registry), can be found at www.ggas-registry.nsw.gov.au. It can be accessed by all ESS participants and members of the public. Its basic functions include:

- listing details of accreditations and projects in both GGAS and the ESS
- facilitating creation and transfer of ESCs (and NGACs and LUACs)
- listing details and tracking ownership of these certificates
- allowing all participants to surrender these certificates to meet mandatory obligations or personal offset schemes.

The sections below sets out key statistics regarding the creation, transfer and surrender of ESCs as recorded in the Registry. Data in this chapter are current as at 30 June 2010 and are for 2009 vintage ESCs.

6.1 Creation of ESCs

When an ESC is created, the Registry records information about each certificate including the entity, activity and activity type associated with it, and the vintage and creation date. The Registry also tracks the certificate status (live, surrendered, forfeited) and ownership history. One ESC represents 1 tonne of carbon dioxide equivalent emissions and once surrendered, cannot be reused.

The Registry imposes charge a $0.70 for the creation of each ESC. This charge is intended to cover the cost of establishing, operating and maintaining the Registry over the life of ESS, as well as to partially and indirectly fund some of the activities of the Scheme Regulator and Scheme Administrator. Funds received from ESC creation totalled approximately $195,000 for 2009 vintage ESCs, and were paid to Consolidated Revenue.

6.1.1 Number of ESCs created

Tables 6.1, 6.2 and 6.3 detail the total number of 2009 vintage ESCs created in respect to energy savings activity undertaken in 2009.

Table 6.1 2009 ESCs created by calculation method

Calculation method	2009	% of total
Project Impact Assessment Method	**136,001**	**48.89%**
Metered Baseline Method		
Baseline per unit of output	89,497	32.17%
Baseline unaffected by output	730	0.26%
Normalised baselines	0	0.00%
Normalised by NABERS scheme	4,073	1.46%
Metered Baseline Method Total	**94,300**	**33.90%**
Deemed Energy Savings Method		
Default Savings Factors	37,752	13.57%
Commercial Lighting Formula	10,123	3.64%
High Efficiency Motor Formula	0	0.00%
Power Factor Correction Energy Savings Formula	0	0.00%
Deemed Energy Savings Method Total	**47,875**	**17.21%**
Total	**278,176**	**100.00%**

Table 6.2 2009 ESCs created by project type

Project type	2009	% of total
End User Equipment - Commercial	61,819	22.22%
End User Equipment - Industrial	168,475	60.56%
End User Equipment - Residential	7	0.00%
Lighting (CLF) - Commercial	8,282	2.98%
Lighting (CLF) - Industrial	1,841	0.66%
Lighting (DSF) - Commercial	0	0.00%
Lighting (DSF) - Residential	0	0.00%
Refrigerator & freezer removal - Residential	0	0.00%
Showerheads - Commercial	0	0.00%
Showerheads - Residential	37,051	13.32%
Whitegoods - Residential	701	0.25%
Total	**278,176**	**100.00%**

Table 6.3 2009 ESCs created by sector

Sector	2009	% of total
Commercial	70,101	25.20%
Industrial	170,316	61.23%
Residential	37,759	13.57%
Total	278,176	100.00%

Appendix B provides a complete breakdown of ESC creation by individual activity.

6.1.2 Estimated energy savings associated with those ESCs

In general, ESCs are created after the energy savings occur; however the ESS Rule also allows certain types of activities to create ESCs in advance of the actual savings:

- The Project Impact Assessment Method allows forward creation of ESCs. Up to 5 years of project savings can be brought to account at the commencement of the accreditation (see section 4.1.1 for further information).
- The Deemed Energy Savings Method allows ESCs to be claimed at the time of installation for the deemed lifetime of the end-user equipment (see section 4.1.3 for further information).

For RESAs where forward creation or deeming applies, an estimate of energy savings occurring in each year is calculated by pro-rating the energy savings claimed up-front across the deeming or forward creation period. In addition, the discount factors listed in Table 16 of the ESS Rule are applied across the 5-year forward creation period for projects which have forward created using the Project Impact Assessment Method.

While an Accredited Certificate Provider can claim the energy savings that have been discounted at the end of the 5-year forward creation period (subject to audit and the provision of appropriate evidence that the discounted energy savings have actually occurred), these energy savings have been accounted for in this report in order to present the most conservative estimate of energy savings likely to be achieved.

Taking into account the number of ESCs created and the forward creation and deeming associated with these ESCs, we estimate that the adjusted energy savings[17] for 2009 was 133,568 MWh, and the projected energy savings to 2020 is 262,430 MWh. Table 6.4 provides details of these estimates. Appendix C provides the estimated energy savings by individual activity.

[17] Section 174 of the Act requires an estimate of the actual energy savings that have been realised with regard to the number of ESCs created.

Table 6.4 Estimated energy savings (MWh) by calculation method[a]

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Project Impact Assessment Method	**41,604**	**34,728**	**22,742**	**16,243**	**9,743**	**3,243**	**0**	**0**	**0**	**0**	**0**	**0**	**128,303**
Metered Baseline Method													
Baseline per unit of output	84,431	-	-	-	-	-	-	-	-	-	-	-	84,431
Baseline unaffected by output	689	-	-	-	-	-	-	-	-	-	-	-	689
Normalised baselines	0	-	-	-	-	-	-	-	-	-	-	-	0
Normalised by NABERS scheme	3,842	-	-	-	-	-	-	-	-	-	-	-	3,842
Metered Baseline Method Total	**88,962**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**88,962**
Deemed Energy Savings Method													
Default Savings Factors	2,532	5,054	5,054	5,054	5,054	5,054	5,054	2,552	60	60	60	30	35,615
Commercial Lighting Formula	471	939	939	939	939	939	939	939	939	939	548	79	9,550
High Efficiency Motor Formula	0	0	0	0	0	0	0	0	0	0	0	0	0
Power Factor Correction Energy Savings Formula	0	0	0	0	0	0	0	0	0	0	0	0	0
Deemed Energy Savings Method Total	**3,002**	**5,993**	**5,993**	**5,993**	**5,993**	**5,993**	**5,993**	**3,491**	**999**	**999**	**608**	**109**	**45,165**
Total estimated energy savings	**133,568**	**40,721**	**28,735**	**22,235**	**15,736**	**9,236**	**5,993**	**3,491**	**999**	**999**	**608**	**109**	**262,430**

a Accreditations under the Metered Baseline Method are only able to create ESCs in respect of energy savings which have already occurred. As such, 2009 vintage ESC creation from these accreditations reflects energy savings which occurred during 2009. In contrast, accreditations under the Deemed Energy Savings Method and Project Impact Assessment Method are eligible to create ESCs in respect of energy savings which have yet to occur. As a result, 2009 ESC creation reflects energy savings which is estimated for future years (up to 5 years).

6.2 Surrender of ESCs

Table 6.5 shows, the total number of ESCs surrendered by Scheme Participants was 148,928 for 2009. The Registry also allows any member of the public to own ESCs which can be surrendered to offset emissions – known as voluntary surrender. No ESCs were voluntarily surrendered for 2009.

Table 6.5 Total certificates surrendered

Status	2009 compliance year (ESCs)
Total ESCs surrendered by Scheme Participants	148,928
Total ESCs voluntarily surrendered	0
Total	**148,928**

6.3 Transfer of ESCs

ESCs are transferrable and the Registry records all changes in ownership of ESCs. However, the Registry is not a trading platform as trading of certificates is expected to occur outside of the Registry whether bilaterally, through brokers or through other trading platforms.

The first transfer of ESCs occurred in November 2009 and since then 459,658 ESCs have been transferred in 60 individual transfers. Table 6.6 details monthly transfers of ESCs since the first transfer in November 2009. As expected, a higher volume of transfers occurred before the compliance date of 29 April 2010.

Table 6.6 ESCs transferred each calendar month

Year	Number of transfers	Number of ESCs transferred
November 2009	3	5,713
December 2009	3	13,000
January 2010[a]	9	65,054
February 2010[a]	6	79,873
March 2010[a]	12	100,479
April 2010[a]	12	59,300
May 2010[a]	9	103,831
June 2010[a]	6	32,408
Total	**60**	**459,658**

[a] From 1 January to 30 June 2010

7 Projected supply and demand

IPART monitors and publishes information about the supply of and demand for ESCs annually, including our projections of future supply and demand. However, it is important to note that our projections are based on known information about existing participants and applications for accreditation, and where necessary, some conservative assumptions. They are not based on forecast modelling, and do not take account of growth in demand for ESCs from voluntary carbon markets.

Also note that information about historic creation of ESCs by Accredited Certificate Providers is publicly available on the GGAS & ESS Registry[18]. This data should assist market participants in making their own projections of supply and demand.

The following sections outline the developments that influenced ESC supply and demand in 2009, trends in the ESC spot price (which may influence supply and demand in the coming years), our approach for projecting ESC supply and demand to 2014, and our projection results.

7.1 Developments that influenced ESC supply and demand in 2009

In any year, ESC demand is largely determined by the energy savings target for that year, and the numbers of ESCs Scheme Participants are obliged to surrender to meet their individual targets (based on electricity sales for that year). As such, the actual total demand figure is not known in advance, but was subsequently identified as 289,118 ESCs for the 2009 compliance year following submission of Annual Energy Savings Statements by Scheme Participants.

When the ESS commenced on 1 July 2009, it was anticipated that the ESC supply may not be sufficient to meet this demand, due to the short lead-time between announcement of the ESS and its commencement date, coupled with the necessary time lag between processing applications for accreditation under the ESS and subsequent accreditations to create ESCs. Therefore, the Government made provisions for Scheme Participants to be able to carry forward up to 50% of their obligation to surrender ESCs to the 2010 calendar year.

18 https://www.ggas-registry.nsw.gov.au/

However, the supply of ESCs turned out to be larger than expected, and was nearly sufficient to meet Scheme Participants' total obligation for 2009. This was largely due to the number of existing Accredited Certificate Providers and RESAs that transitioned into the ESS from GGAS. In particular:

- During the 6 months to 31 December 2009, 25 Accredited Certificate Providers were accredited for 32 RESAs. Twenty-one of these providers and 28 of these RESAs were already accredited under the DSA Rule of GGAS, and transitioned into the ESS under the transition provisions of the ESS Rule. The remainder were new accreditations.
- During the period 1 January 2010 to 29 April 2010 (ie, the 2009 AESS deadline), another 2 existing Accredited Certificate Providers and 2 RESAs transitioned to the ESS, and a further 1 new Accredited Certificate Providers and 9 new RESAs were accredited to create 2009 vintage ESCs, for immediate supply to the market.
- Although the first 2 RESAs were accredited under the ESS in mid-August 2009, the first ESC supply to the market did not occur until 1 October 2009.

In total, 23 Accredited Certificate Providers, representing 33 RESAs, created 278,176 ESCs for eligible energy savings activity during the period 1 July 2009 to 31 December 2009. This represented approximately 96% of the total obligation on Scheme Participants for 2009, well in excess of the carry forward figure of up to 50%.

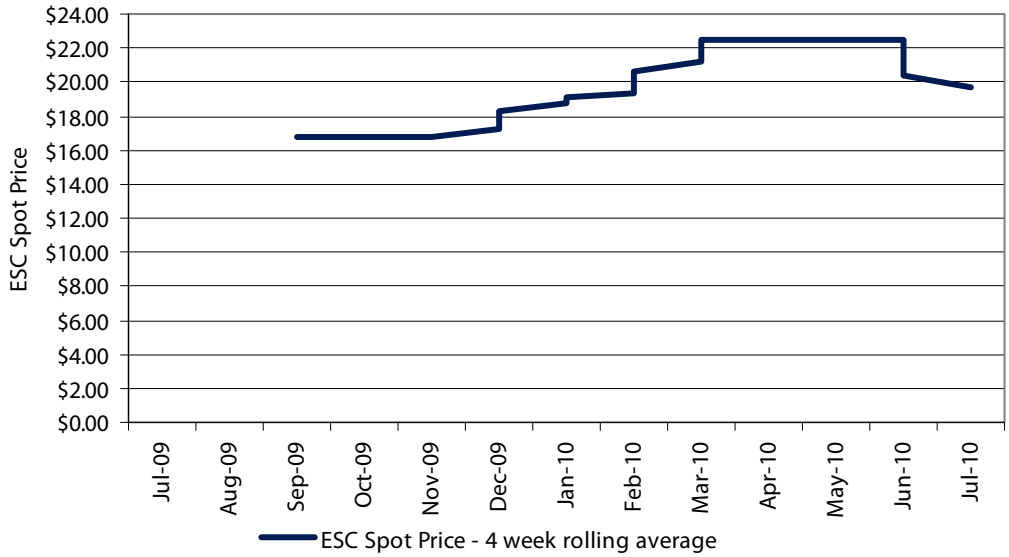
A further 8 Accredited Certificate Providers in respect of 8 RESAs that were intending to create 2009 vintage ESCs failed to do so, due to delays in implementation of their RESA.

7.2 Trends in the ESC spot price

IPART does not have responsibility for regulating the price or trading of ESCs. However, we observe trends in the ESC spot market price, as these can influence supply and demand. For example, if prices go up, more projects will be cost effective to implement, which may lead to an increase in ESC supply.

Figure 7.1 shows the trend in the spot prices recorded for spot trades (where known). It indicates that in the short period the ESS has been in place, the ESC spot price climbed significantly from $16.75 in August 2009 (shortly after ESS commencement) to $22.50 in March 2010 (prior to the 2009 compliance year deadline of 29 April 2010). More recent trades (eg in June 2010) suggest it is maintaining this $22.50 level.

Figure 7.1 Trends in the ESC spot price over 2009 and 2010



Note: This figure shows a four week rolling average of the last market spot price. This data accounts only for ESCs traded through NGES and may not reflect the price paid by NGAC buyers at the times shown. The Scheme Administrator recommends that persons seek independent advice before buying or selling ESCs, and cautions against making decisions based solely on this chart.

Data source: The Green Room, published by NGES (see www.nges.com.au)

Please note that spot trades constitute only a small proportion of total ESC transactions. Most ESC transactions are bilateral trades, where the price may be agreed in advance for an extended period. The ESC prices for such transactions may differ significantly from the prevailing spot price. Nevertheless, the spot price provides a useful guide to broad movements in the ESC price over time.

Also note that several factors could influence future ESC supply and demand, and so could also influence the ESC price. These include:

- uncertainty arising from the Minister's review of the ESS Rule (announced on 16 April 2010), which will particularly focus on ongoing showerhead installation activities under the ESS
- uncertainty about how the Commonwealth's National Strategy on Energy Efficiency will interact with and impact on the ESS
- the publication of projections of future ESS supply and demand.

Box 7.1 provides an overview of market commentary from The Green Room, a weekly report of spot market trades published by Next Generation Energy Solutions.

Box 7.1 Market commentary from Next Generation Energy Solutions, The Green Room, Editions 211-235

July 2009: It was reported that the ESC market was expected to develop relatively quickly, with interest beginning to emerge around the short forward and structured market (with initial bids in the $13-$14 range against offers in the $21-22.50 range. However it was also reported that many participants were still trying to familiarise themselves with the new market.

August 2009: A spot trade deal was still to take place in the ESC market, with sellers reportedly holding out for trades around the $19.00 mark, with buyers holding their ground around $12. The first ESS accreditations took place in mid August.

September – November 2009: The first reported deal (at $16.75) occurred during this period. However, with few ESCs created to date, there was very little other spot market activity during this period, with $16.75 remaining a benchmark.

December 2009: With 2009 ESS compliance obligations coming up in the new year, the month of December saw some increased trading activity (at around the $18.75 mark), although activity remained at low levels. This was most likely due to the relatively low numbers of ESCs created to date but also due to the small compliance obligations for Scheme Participants in 2009, coupled with the ability for Scheme Participants to carry forward up to 50% of their obligation to the following year.

As Scheme Participants are required to pay a penalty price of $24.50 per MWh if they fail to meet their annual compliance obligation, the effective ESC price ceiling is approximately $30. This ESC ceiling figure is calculated on the basis of the prescribed penalty conversion factor of 0.94 (as per Schedule 5A of the Act) and is inclusive of company tax (as payment of the penalty is not tax deductible, unlike ESC surrender).

7.3 Our approach for projecting ESC supply and demand to 2011

To calculate future ESC demand, we used the methodology prescribed in Section 106 of the Act, which involved making a number of assumptions about some of the inputs for this methodology. To calculate ESC supply, we used the expected ESC creations (as nominated by accredited RESAs and current applicants) as our base data, and 2 projection scenarios.

7.3.1 Projecting ESC demand

We based our calculation of the future demand for ESCs on the methodology prescribed in Sections 106 and 107 of the Act. The future demand calculation is primarily based on estimates of future electricity demand in NSW as determined by TransGrid[19].

In simple terms, we calculated the demand in each year from 2009 to 2011 (inclusive) as follows:

*Demand = Total Liable Acquisitions * Energy Savings Target * Energy Conversion Factor*

where

Total Liable Acquisitions = TransGrid's Total End Use Electricity Sales (for NSW only)[20] *– Total Exempt Load Deductions*

The Energy Savings Target and Energy Conversion Factor are prescribed in Schedule 5 to the Act. To calculate the Total Liable Acquisitions we used:

- TransGrid's mid-range estimates of electricity demand for NSW (excluding the ACT), as published in its Annual Planning Report 2009.[21]
- Our own assumption that Exempt Load Deductions will equal approximately 20% of all electricity purchases in NSW.

The projections for electricity demand in TransGrid's 2009 report may be conservative, as they are likely to reflect assumptions about the impact of the anticipated global economic slowdown on electricity consumption. As this global slowdown and its effect on electricity consumption has been smaller than expected, the projections in the TransGrid Annual Planning Report for 2010 may be higher than those we relied on for our ESC demand projections. (The TransGrid report for 2010 was not available when we prepared this report.)

As Total Exempt Load Deductions in any future year are unknown until Scheme Participants lodge their AESSs, we needed to make an assumption about this quantity. For 2009, this deduction was approximately 20% of electricity purchases for the 2009 compliance year. We considered that this is a suitable proxy for estimating demand in future years.

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19 TransGrid is the premier electricity planning authority for NSW and owns, operates and manages the New South Wales high voltage electricity transmission network

20 As per Table A3.1 of the New South Wales Annual Planning Report released by TransGrid on 30 June of each year. Note: projected End Use Sales in this report also includes the ACT.

21 TransGrid Annual Planning Report 2009, see http://www.transgrid.com.au/aboutus/pr/Pages/AnnualReports.aspx

7.3.2 Projecting ESC supply

To derive the base data for calculating future supply of ESCs, we used Accredited Certificate Providers' and applicants' calculations of the number of ESCs they expect to create from their RESAs over the period 1 July 2009 to 31 December 2011. For RESAs already accredited, this number generally reflects the Nominated Number of ESCs reported in the Accreditation Notice; however where annual reports have been submitted (as part of an ACP's accreditation compliance obligations) the ACPs' updated forecast figures have been used. For RESAs still in the application stage, we use forecast numbers that are an expected creation pattern based on the applicant's own calculations.

We then projected ESC supply to the end of 2011 under 2 different supply-side scenarios. These scenarios were based on our knowledge of the potentially variable sources of supply for ESCs, and include:

- **Scenario One:** The projected supply of ESCs is based on the energy savings expected to be achieved by currently accredited RESAs only (ie, excluding RESAs still in the applicant stage), and with no adjustment for possible changes to the ESS Rule (ie, changes to showerhead related accreditations – see further below). This scenario is the low-range projection.
- **Scenario Two:** The projected supply of ESCs is based on the energy savings expected to be achieved by all currently accredited RESAs and all RESA applicants (to date) with no adjustment for possible changes to the ESS Rule. Again, it is assumed that the applicant RESAs will be accredited and will commence energy saving activities as anticipated by their proponent. This scenario is the high-range projection.

While the Act allows for ESS to continue until 2020, we have chosen to project ESC supply and demand to the end of 2011 only. This shortened time frame reflects the fact that any projection more than 2 years out may be unreliable due to:

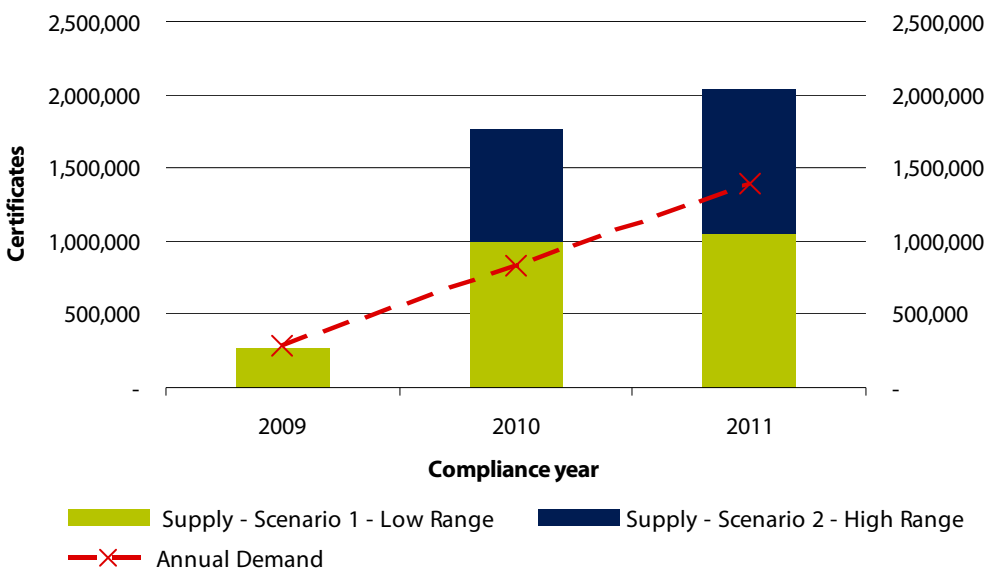
- the short history of the ESS to date (and therefore only limited knowledge on participant behaviour to date)
- the effect of forward creation on projections, whereby some project proponents are eligible to forward create ESCs for up to 5 years in advance (see section 4.1).

It should also be noted that the ESC supply scenarios in Figure 7.2 below only include those RESA projects that are currently 'on the books' as of 30 June 2010. That is, they represent either an accredited RESA, or a RESA application currently lodged with the Scheme Administrator. It is anticipated that further applications will be received into the future which will add to the ESC supply illustrated below.

7.4 Projection results

Figure 7.2 shows our latest projections for ESC supply and demand to 2011, based on data current at 30 June 2010.

Figure 7.2 IPART's projections for ESC supply and demand, 2009 to 2011



Note: As at 30 June 2010. The projections above are for illustrative purposes only and should not be relied upon.

With supply extremely close to meeting demand in 2009, the outlook for supply in 2010 looks promising for both supply scenarios, generally on the back of proposed showerhead related replacement activity. However the outlook for supply in 2011 will be somewhat tighter if applications currently on the books fail to be either accredited, or to meet the applicant's original ESC creation expectations (dependent upon the outcomes of the Ministerial Review of the ESS Rule (see Section 7.2 above)).

Scenario One, which represents accredited project forecasts only, shows an increase and then flattening out of supply to 2011. This flattening is due to the fact that a number of accreditations forward created ESCs in 2009, with no further ability to create ESCs until after 2014 (if eligible). The remainder of accredited projects will continue to create ESCs after 2009 however, and it is these projects that effectively balance out the 'hiatus' in ESC creation from the aforementioned projects.

Scenario Two shows a good supply of ESCs into the future. The basis for the significant increase in supply is that applicants' for showerhead replacement RESAs are accredited, and that they then meet their program delivery expectations (in terms of ESC creation).

The only real difference in these 2 scenarios is the level of energy savings achieved by the showerhead replacement programs. In this regard it is important to note that there is currently a Ministerial Review into showerhead replacement activity under

the Scheme, due to perceptions of a saturated market for this type of RESA activity[22]. Dependent upon the outcomes of this Ministerial review, there is the potential that ESC creation may be impacted into the future from this type of project activity.

Despite any reduction in ESC supply after 2010, there is an expectation of continued steady growth in energy savings from the commercial and industrial sectors, as accredited (and proposed) RESA activity in these sectors is yet to be fully engaged.

7.5 Analysis of Demand versus Supply

The demand for ESCs is expected to steadily rise in the period to 2011 (and ongoing). The rise can primarily be attributed to:

- the steadily increasing ESS target (identified in Schedule 5A of the Act), which rise in yearly increments to 2014 after which it maintains at a constant 5% of total electricity sales, and
- a steady increase in electricity consumption over the next 5 years (as forecast by TransGrid in its 2009 Annual Report).

Under Scenario One, (as shown in Figure 7.2), annual supply of ESCs is above annual demand for 2010, even allowing for the shortfall carried forward from the 2009 compliance year, but supply then drops below demand in 2011. However ESCs do not expire, and an ESC created with a particular vintage may be surrendered against a compliance obligation for any year thereafter[23]. For example, an ESC of 2009 vintage may be surrendered against a compliance obligation in any year from 2010 onwards. It is therefore possible, that the cumulative surplus of supply experienced in 2010 may assist in meeting the projected demand for 2011. This scenario is in regard to current accreditations only, and is inherently conservative.

Under Scenario Two, cumulative supply is forecast to significantly exceed demand for the 2010 and 2011 compliance years.

However, the nature of the assumptions around the implementation of projects such as showerhead replacement projects, and the Minister's review of the ESS Rule, illustrates the uncertainty of these supply scenarios. It is likely that, as new methodologies and expanded factors for end user equipment are added to the ESS Rule, new applications will be submitted to conduct activities in these areas. This will result in changes to the supply projections shown above.

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22 In April 2010 the Scheme Administrator commissioned an independent survey by NewsPoll to ascertain the market penetration of showerhead replacement programs in greater Sydney, under the ESS. A subsequent independent survey of the market penetration of showerhead replacement programs in regional NSW was commissioned by the Department of Energy Climate Change and Water, in June 2010. The weighted average survey data from both identified that only 18% of the NSW market remains eligible for further activity of this type.

23 The number of certificates that are available for surrender can be found in Table 6.5.

Appendices

A Overview of the ESS

The ESS is a NSW-based energy efficiency scheme which commenced on 1 July 2009. It is legislated to continue until 2020 or until a national scheme with similar objectives is introduced. Its principal objective is to reduce carbon emissions by creating a financial incentive to reduce the consumption of electricity through energy savings activities. It does not include the use of gas.

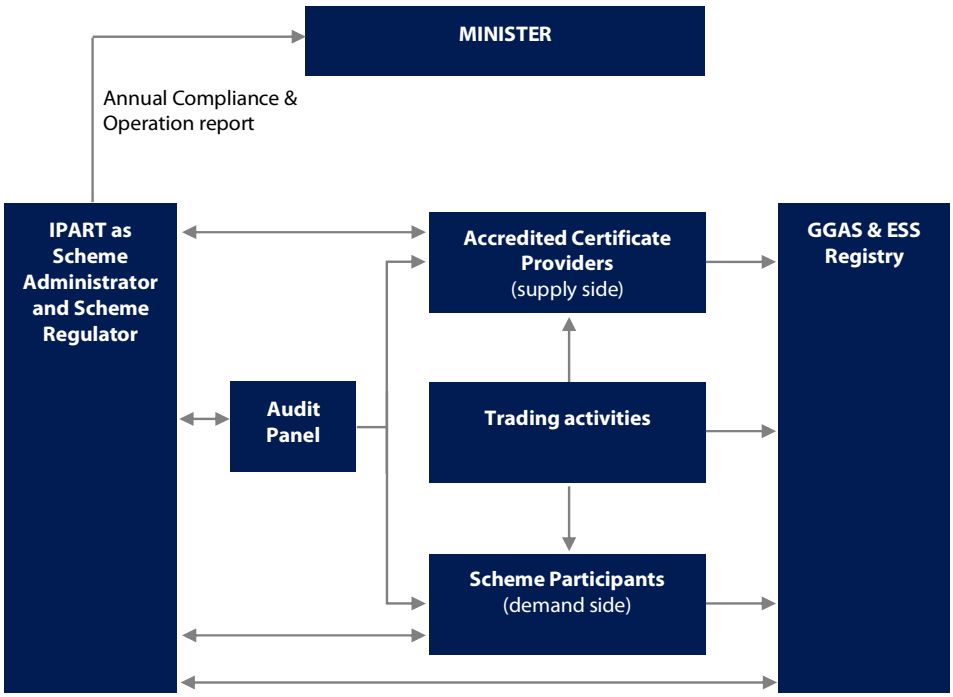
The ESS is designed to increase opportunities to improve energy efficiency by placing obligations on parties to undertake or pay for energy efficiency programs, and rewarding companies that undertake eligible projects that either reduce electricity consumption or improve the efficiency of electricity use. It was developed as a complementary but independent measure to the proposed CPRS and is modelled on the end-use energy efficiency part of the Demand Side Abatement component of GGAS. This part of GGAS ceased with the commencement of the ESS.

The ESS is governed by NSW legislation and places a mandatory obligation on Scheme Participants (electricity retailers and other parties licensed to buy or directly supply electricity in NSW) to obtain and surrender Energy Savings Certificates (ESCs), which represent eligible energy savings under the ESS. Scheme participants purchase ESCs from Accredited Certificate Providers, who create ESCs following the implementation of recognised energy savings activities (RESAs). Companies that are Scheme Participants may also apply to become Accredited Certificate Providers.

Figure A.1 provides an overview of the structure of ESS. The sections below provide more information on key elements of the scheme, including the:

- functions of the Scheme Regulator and Scheme Administrator
- Scheme Participants
- Accredited Certificate Providers and RESAs
- ESS Registry
- ESS legislation
- Ministerial Order and Exemptions Rule, and
- ESS targets.

Figure A.1 Structure of the ESS



A.1 Functions of Scheme Regulator and Scheme Administrator

The Scheme Regulator's role is to monitor the Scheme Participants' compliance with the ESS targets, which includes conducting independent audits of this compliance.

The Scheme Administrator's roles include:

- assessing applications for accreditation as an Accredited Certificate Provider
- accrediting these providers to undertake eligible activities and to create ESCs from those activities
- monitoring compliance of Accredited Certificate Providers by conducting independent audits
- managing the GGAS & ESS Registry – an online database which records the registration, transfer and ultimate surrender of ESCs.

A.2 Scheme Participants

Electricity retailers and certain other parties who buy or directly supply electricity in NSW are mandatory participants in the ESS and are called Scheme Participants. Scheme Participants are required to meet individual energy savings targets based on the size of their share of NSW's liable electricity acquisitions.

Scheme Participants buy ESCs from Accredited Certificate Providers. Each Scheme Participant must calculate its individual energy savings target and obtain and surrender ESCs in order to meet its target. If a Scheme Participant does not surrender sufficient ESCs, it will have an energy savings shortfall and can choose to carry this shortfall forward to the following year (within the allowable limits) or be subject to a shortfall penalty.

To comply with the ESS, Scheme Participants must lodge an Annual Energy Savings Statement (AESS) with the Scheme Regulator each year. The legislation provides for the Scheme Regulator to require that these statements be audited as part of its assessment of Scheme Participants' compliance. Where an audit is required, Scheme Participants are required to engage an auditor from the ESS Audit Services Panel.

A.3 Accredited Certificate Providers and recognised energy savings activities

Companies voluntarily apply for accreditation in the ESS to undertake recognised energy savings activities (RESAs). Once accredited, they are called Accredited Certificate Providers. They are subject to a number of conditions of accreditation which outline their responsibilities as determined by the Act, Regulation and the *Energy Savings Scheme Rule of 2009* (ESS Rule).

RESAs are the specific activities implemented by Accredited Certificate Providers to reduce the consumption of electricity or increase the efficiency of electricity consumption. A RESA cannot include an activity that has been undertaken to comply with any Statutory Requirement. In addition, a RESA cannot reduce the scope or quantity of production or service from the use of electricity. For example, closing part of a factory would not qualify as a RESA under the ESS. In addition, a RESA must have been implemented on or after 1 July 2008 to be eligible.

The legislation provides for the Scheme Administrator to require audits of RESAs as part of the assessment of compliance by Accredited Certificate Providers. Where an audit is required, Accredited Certificate Providers are required to engage an auditor from the ESS Audit Services Panel.

A.4 ESS Registry

The ESS Registry is a web-based database that records Accredited Certificate Providers and ESCs as required by legislation. The Registry tracks ESC creation, transfer and surrender and can be accessed by all participants and members of the public.

ESCs are transferrable and the Registry records all changes in ownership of ESCs. However, the Registry is not a trading platform as trading of certificates is expected to occur outside of the Registry whether bilaterally, through brokers or through other trading platforms.

A.5 The ESS legislation

The ESS is established in NSW through the *Electricity Supply Act 1995* (the Act). The Act sets out the legal and technical framework of the ESS as well as the functions and responsibilities of Scheme Regulator and Scheme Administrator.

The Act is supported by the *Electricity Supply (General) Regulation 2001* (the Regulation) which makes provision for aspects of the operation of the ESS. The Regulation provides further details of the ESS, such as:

- the assessment of compliance of Scheme Participants
- the eligibility requirements for accreditation as an Accredited Certificate Provider
- the conditions of accreditation that are imposed by the Scheme Administrator
- the creation and transfer of ESCs
- the conduct of audits
- the requirement to maintain a register of Accredited Certificate Providers and a register of ESC creation and ownership.

The ESS Rule issued by the Minister for Energy provides additional eligibility requirements and calculation methodologies for Accredited Certificate Providers and their accreditations. The ESS Rule sets out:

- the types of eligible and ineligible activities
- the requirements for eligible applicants
- detailed calculation methodologies
- the rules for the creation of ESCs.

The Department of Industry and Investment (formerly the Department of Water and Energy) has responsibility for policy development of the ESS and ultimate responsibility for any legislative changes introduced to the ESS.

A.6 Ministerial Order and the Exemptions Rule

Exemptions are allowed under the ESS for electricity loads used in conjunction with emission intensive and trade exposed industries or activities and have been granted by the NSW Minister for Energy in a Ministerial Order[24]. The Ministerial Order lists each exempted person, and each emissions intensive trade exposed activity being carried out, the location and the proportion of electricity load granted exemption (either 60% or 90%). The order also allows a further deduction for network losses and authorises the Scheme Regulator to make rules with respect to the way in which

[24] The Ministerial Order can be downloaded from the ESS website at http://www.ess.nsw.gov.au/documents/syn15.asp

the deduction of the exempt load is applied and the evidence needed in support of these deductions.

The most recent Ministerial Order was published on 18 December 2009 and applies from the commencement of the ESS on 1 July 2009 until 31 December 2010. Any change to the Ministerial Order needs to be gazetted prior to 31 December of the year preceding the year the order is to have its effect. After commencement of the year, any change to the Order will not take effect until the following year.

Scheme Participants that supply electricity to a person specified in the Ministerial Order are entitled to deduct a specified portion of the electricity load from that location from their liable acquisitions using the *Scheme Regulator Exemptions Rule No. 1 of 2009* (Exemptions Rule). The Exemptions Rule outlines the manner in which Scheme Participants calculate and claim deductions from the total value of their liable acquisitions and specifies the evidence Scheme Participants must provide in support of any deductions.

Exemptions under the ESS are designed to align with the approach the Commonwealth Government is taking regarding emissions intensive trade exposed industries and activities in implementing its expanded Renewable Energy Target and the proposed CPRS.

A.7 ESS targets

The ESS has legislated targets for each year that need to be met through the surrender of ESCs by Scheme Participants. The ESS target for each year is allocated to Scheme Participants in proportion to their liable acquisitions. A Scheme Participant's liable acquisitions do not include all its NSW electricity sales, but are calculated by subtracting sales to partially exempt industries or activities from the Scheme Participant's electricity sales in NSW. This results in an 'effective' target that, for NSW, is approximately 20% less than the legislated target (20% being the approximate percentage of exempt sales).

Table A.1 shows that the target gradually increases until 2014, after which it remains constant until 2020. As a proportion of NSW electricity sales are exempt, the 'effective' ESS targets are less than that shown in this table.

Table A.1 Annual ESS targets over life of scheme

Year	ESS target (% of annual liable acquisitions)
2009[a]	0.5%
2010	1.5%
2011	2.5%
2012	3.5%
2013	4.5%
2014-2020	5.0%

[a] Half year from 1 July.

The targets were developed following modelling by consultants engaged by the Department of Environment, Climate Change and Water (DECCW). The modelling involved estimation of the marginal cost of abatement for various energy efficiency activities, and the amount of energy savings that could be achieved based on differing ESC prices.

Although the targets in the ESS are based on electricity sales (MWh), ESCs are measured in tonnes of CO_2 equivalent to be consistent with GGAS and the CPRS. In converting MWh to CO_2 equivalents, a recognised and robust greenhouse emission factor needs to be applied. Drawing on work carried out by the Commonwealth, the value of 1.06 kg CO2-e/kWh has been approved for use in the ESS. This factor is called the ESS certificate conversion factor and is listed in Schedule 5B of the Act.

B Creation of ESCs

The ESS Rule makes provisions for the creation for ESCs where an Accredited Certificate Provider is carrying out an eligible RESA. This Appendix includes information on ESC creation of all individual activities.

Data in this chapter are current as at 30 June 2010.

B.1 ESCs created by calculation method

Table B.1 Project Impact Assessment Method

Owner and project name	2009
BOC Ltd: Port Kembla LMPC	0
Boral Ltd: Berrima Kiln 6 Upgrade	6,350
Commonwealth Bank of Australia: Branch Network BMS Upgrade	271
Commonwealth Bank of Australia: Lighting Controls	282
Commonwealth Bank of Australia: Voltage reduction in branch network lighting	275
Commonwealth Bank of Australia: VSD Upgrades on cooling fans and condenser pump	58
Continental Carbon Australia Pty Ltd: Installation of VSD on boiler fan	816
Demand Manager Pty Ltd: Lighting Aggregation Project - PIAM	44,886
GridX Power Pty Ltd: Glenfield Project Home Space Cooling Project	7
Merck Sharp & Dohme (Australia) Pty Ltd: Lighting Voltage Reduction	0
Norske Skog Paper Mills (Aust) Ltd: Deckers Feed Pump Bypass	2,246
NSW Roads and Traffic Authority: Upgrade of Traffic Lights	31,180
Out Performers (Griffone Family Trust trading as): Glycol Heat Exchanger	900
Out Performers (Griffone Family Trust trading as): Grasso Compressor VSD	517
Out Performers (Griffone Family Trust trading as): Compressor System Upgrade	1,665
Out Performers (Griffone Family Trust trading as): Condenser System Upgrade	1,615
Out Performers (Griffone Family Trust trading as): Fume Fan VSD	1,618
Out Performers (Griffone Family Trust trading as): Heat Slingers	700
Out Performers (Griffone Family Trust trading as): Heel Procedure	9,335
Out Performers (Griffone Family Trust trading as): EAF Efficiency	17,447
Out Performers (Griffone Family Trust trading as): Eleebana WPS	172
Out Performers (Griffone Family Trust trading as): Kahibah No. 1 WWPS	233
Out Performers (Griffone Family Trust trading as): Swansea 3A WWPS Sewer Relining	117

Owner and project name	2009
Out Performers (Griffone Family Trust trading as): Swansea 3A WWPS VSD	453
Out Performers (Griffone Family Trust trading as): Compressed Air Projects	2,759
University of Technology Sydney: Building 2 Lighting Upgrade	585
University of Wollongong: Occupancy Sensor and Voltage Reduction for Lighting	323
Visy Pulp & Paper Pty Ltd: Cooling Water Pumps Improvement	855
Woolworths Ltd: Supermarket After Hours Lighting Controls	10,336
Total	**136,001**

Table B.2 Metered Baseline Method - baseline per unit of output

Owner and project name	2009
Amcor Packaging (Australia) Pty Ltd: Botany Paper Mill - Whole of Site	7,090
Carter Holt Harvey Australia Pty Ltd: Oberon Refiner Control Improvement	7,363
Hydro Aluminium Kurri Kurri Pty Ltd: Kurri Kurri Smelter Upgrade and Retrofit	44,836
Orica Australia Pty Ltd: Botany Chlorine Plant Upgrade	12,129
Tomago Aluminium Company Pty Ltd: Smelting Electrical Energy Reduction	18,079
Total	**89,497**

Table B.3 Metered Baseline Method - baseline unaffected by output

Owner and project name	2009
Sydney West Area Health Service: EPC and GEEIP	730
Total	**730**

Table B.4 Metered Baseline Method - normalised by NABERS scheme

Owner and project name	2009
Charter Hall Asset Services Limited: Building Energy Consumption Reduction	4,073
Total	**4,073**

Table B.5 Deemed Energy Savings Method - Default Savings Factors

Owner and project name	2009
Aspect Energy: Residential Showerlite Program	35,928
Demand Manager Pty Ltd: Carbon Saver Program	0
Enact Energy Pty Limited: Halogen and Transformer Replacement - Commercial	0
Enact Energy Pty Limited: Halogen Replacement - Commercial (ESS	0
Enact Energy Pty Limited: Halogen Replacement - Residential	0
Enact Energy Pty Limited: Showerhead Replacement - Commercial	0
Enact Energy Pty Limited: Showerhead Replacement - Residential	0
Energy Australia: Hairdresser down-light replacement program	0
Envirocare & Savers Pty Ltd t/a Wellbeinggreen: Shower Rose Replacement Program - Commercial	0
Envirocare & Savers Pty Ltd t/a Wellbeinggreen: Shower Rose Replacement Program - Residential	0
Fieldforce Services Pty Ltd: Replacement of halogens	0
Fieldforce Services Pty Ltd: Replacement of showerheads	0
Low Energy Supplies and Services Pty Ltd: Direct Sales and Installations - Showerheads	0
Next Energy Pty Ltd: Fridge Buyback	0
Sydney Water Corporation: Washing Machine Rebate Program	701
Sydney Water Corporation: Waterfix	1,123
Total	**37,752**

Table B.6 Deemed Energy Savings Method - Commercial Lighting Formula

Owner and project name	2009
AGL Energy Services Pty Ltd: Commercial Lighting Replacement Project	7,622
Demand Manager Pty Ltd: Commercial Lighting Aggregation Project	0
Energy Australia: Commercial Lighting Aggregation Program	660
NSW Roads and Traffic Authority: Traffic light globe replacement project	1,841
Total	**10,123**

Table B.7 Deemed Energy Savings Method - Power Factor Correction Energy Savings Formula

Owner and project name	2009
Demand Manager Pty Ltd: PFC Aggregation Project - Commercial	0
Demand Manager Pty Ltd: PFC Aggregation Project - Industrial	0
Energy Australia: PFC Aggregation Program	0
Total	**0**

C Estimated energy savings

This Appendix details estimated energy savings (MWh) where forward creation or deeming applies by individual activity. Refer to Section 6.1.2 for further information on estimated energy savings.

Data in this chapter are current as at 30 June 2010.

Table C.1 Project Impact Assessment Method (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
BOC Ltd: Port Kembla LMPC	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Boral Ltd: Berrima Kiln 6 Upgrade	5,991	0	0	0	0	0	0	0	0	0	0	0	**5,991**
Commonwealth Bank of Australia: Branch Network BMS Upgrade	256	0	0	0	0	0	0	0	0	0	0	0	**256**
Commonwealth Bank of Australia: Lighting Controls	266	0	0	0	0	0	0	0	0	0	0	0	**266**
Commonwealth Bank of Australia: Voltage reduction in branch network lighting	259	0	0	0	0	0	0	0	0	0	0	0	**259**
Commonwealth Bank of Australia: VSD Upgrades on cooling fans and condenser pump	55	0	0	0	0	0	0	0	0	0	0	0	**55**
Continental Carbon Australia Pty Ltd: Installation of VSD on boiler fan	129	231	180	128	77	26	0	0	0	0	0	0	**770**
Demand Manager Pty Ltd: Lighting Aggregation Project - PIAM	7,072	12,701	9,878	7,055	4,232	1,409	0	0	0	0	0	0	**42,345**
GridX Power Pty Ltd: Glenfield Project Home Space Cooling Project	7	0	0	0	0	0	0	0	0	0	0	0	**7**
Merck Sharp & Dohme (Australia) Pty Ltd: Lighting Voltage Reduction	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Norske Skog Paper Mills (Aust) Ltd: Deckers Feed Pump Bypass	2,119	0	0	0	0	0	0	0	0	0	0	0	**2,119**
NSW Roads and Traffic Authority: Upgrade of Traffic Lights	4,912	8,823	6,862	4,901	2,940	979	0	0	0	0	0	0	**29,415**
Out Performers (Griffone Family Trust trading as): Glycol Heat Exchanger	142	255	198	141	85	28	0	0	0	0	0	0	**849**
Out Performers (Griffone Family Trust trading as): Grasso Compressor VSD	81	146	114	81	49	16	0	0	0	0	0	0	**488**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Out Performers (Griffone Family Trust trading as): Compressor System Upgrade	262	471	366	262	157	52	0	0	0	0	0	0	**1,571**
Out Performers (Griffone Family Trust trading as): Condenser System Upgrade	254	457	355	254	152	51	0	0	0	0	0	0	**1,524**
Out Performers (Griffone Family Trust trading as): Fume Fan VSD	765	762	0	0	0	0	0	0	0	0	0	0	**1,526**
Out Performers (Griffone Family Trust trading as): Heat Slingers	331	330	0	0	0	0	0	0	0	0	0	0	**660**
Out Performers (Griffone Family Trust trading as): Heel Procedure	4,412	4,394	0	0	0	0	0	0	0	0	0	0	**8,807**
Out Performers (Griffone Family Trust trading as): EAF Efficiency	2,749	4,937	3,839	2,742	1,645	548	0	0	0	0	0	0	**16,459**
Out Performers (Griffone Family Trust trading as): Eleebana WPS	27	49	38	27	16	5	0	0	0	0	0	0	**162**
Out Performers (Griffone Family Trust trading as): Kahibah No. 1 WWPS	37	66	51	37	22	7	0	0	0	0	0	0	**220**
Out Performers (Griffone Family Trust trading as): Swansea 3A WWPS Sewer Relining	18	33	26	18	11	4	0	0	0	0	0	0	**110**
Out Performers (Griffone Family Trust trading as): Swansea 3A WWPS VSD	71	128	100	71	43	14	0	0	0	0	0	0	**427**
Out Performers (Griffone Family Trust trading as): Compressed Air Projects	435	781	607	434	260	87	0	0	0	0	0	0	**2,603**
University of Technology Sydney: Building 2 Lighting Upgrade	92	166	129	92	55	18	0	0	0	0	0	0	**552**
University of Wollongong: Occupancy Sensor and Voltage Reduction for Lighting	305	0	0	0	0	0	0	0	0	0	0	0	**305**
Visy Pulp & Paper Pty Ltd: Cooling Water Pumps Improvement	807	0	0	0	0	0	0	0	0	0	0	0	**807**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Woolworths Ltd: Supermarket After Hours Lighting Controls	9,751	0	0	0	0	0	0	0	0	0	0	0	**9,751**
Total estimated energy savings	**41,604**	**34,728**	**22,742**	**16,243**	**9,743**	**3,243**	**0**	**0**	**0**	**0**	**0**	**0**	**128,303**

Table C.2 Metered Baseline Method – baseline per unit of output (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Amcor Packaging (Australia) Pty Ltd: Botany Paper Mill - Whole of Site	6,689	-	-	-	-	-	-	-	-	-	-	-	**6,689**
Carter Holt Harvey Australia Pty Ltd: Oberon Refiner Control Improvement	6,946	-	-	-	-	-	-	-	-	-	-	-	**6,946**
Hydro Aluminium Kurri Kurri Pty Ltd: Kurri Kurri Smelter Upgrade and Retrofit	42,298	-	-	-	-	-	-	-	-	-	-	-	**42,298**
Orica Australia Pty Ltd: Botany Chlorine Plant Upgrade	11,442	-	-	-	-	-	-	-	-	-	-	-	**11,442**
Tomago Aluminium Company Pty Ltd: Smelting Electrical Energy Reduction	17,056	-	-	-	-	-	-	-	-	-	-	-	**17,056**
Total estimated energy savings	**84,431**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**84,431**

Table C.3 Metered Baseline Method – baseline unaffected by output (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Sydney West Area Health Service: EPC and GEEIP	689	-	-	-	-	-	-	-	-	-	-	-	**689**
Total estimated energy savings	**689**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**689**

Table C.4 Metered Baseline Method – normalised by NABERS scheme (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Charter Hall Asset Services Limited: Building Energy Consumption Reduction	3,842	-	-	-	-	-	-	-	-	-	-	-	**3,842**
Total estimated energy savings	**3,842**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3,842**

Table C.5 Deemed Energy Savings Method – Default Savings Factors (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Aspect Energy: Residential Showerlite Program	2,426	4,842	4,842	4,842	4,842	4,842	4,842	2,416	0	0	0	0	**33,894**
Demand Manager Pty Ltd: Carbon Saver Program	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Enact Energy Pty: Halogen and Transformer Replacement - Commercial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Enact Energy Pty: Halogen Replacement - Commercial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Enact Energy Pty: Halogen Replacement – Residential	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Enact Energy Pty: Showerhead Replacement – Commercial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Enact Energy Pty: Showerhead Replacement - Residential	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Energy Australia: Hairdresser down-light replacement program	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Envirocare & Savers Pty Ltd t/a Wellbeinggreen: Shower Rose Replacement Program - Commercial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Envirocare & Savers Pty Ltd t/a Wellbeinggreen: Shower Rose Replacement Program - Residential	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Fieldforce Services Pty Ltd: Replacement of halogens	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Fieldforce Services Pty Ltd: Replacement of showerheads	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Low Energy Supplies and Services Pty Ltd: Direct Sales and Installations - Showerheads	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Next Energy Pty Ltd: Fridge Buyback	0	0	0	0	0	0	0	0	0	0	0	0	**0**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Sydney Water Corporation: Washing Machine Rebate Program	30	60	60	60	60	60	60	60	60	60	60	30	**661**
Sydney Water Corporation: Waterfix	76	151	151	151	151	151	151	76	0	0	0	0	**1,059**
Total estimated energy savings	**2,532**	**5,054**	**5,054**	**5,054**	**5,054**	**5,054**	**5,054**	**2,552**	**60**	**60**	**60**	**30**	**35,615**

Table C.6 Deemed Energy Savings Method – Power Factor Correction Energy Savings Formula (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Demand Manager Pty Ltd: PFC Aggregation Project - Commercial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Demand Manager Pty Ltd: PFC Aggregation Project - Industrial	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Energy Australia: PFC Aggregation Program	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total estimated energy savings	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table C.7 Deemed Energy Savings Method – Commercial Lighting Formula (MWh savings)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
AGL Energy Services Pty Ltd: Commercial Lighting Replacement Project	360	719	719	719	719	719	719	719	719	719	359	0	**7,191**
Demand Manager Pty Ltd: Commercial Lighting Aggregation Project	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Energy Australia: Commercial Lighting Aggregation Program	31	62	62	62	62	62	62	62	62	62	31	0	**623**
NSW Roads and Traffic Authority: Traffic light globe replacement project	79	158	158	158	158	158	158	158	158	158	158	79	**1,737**
Total estimated energy savings	**471**	**939**	**939**	**939**	**939**	**939**	**939**	**939**	**939**	**939**	**548**	**79**	**9,550**

Glossary

This glossary provides a general guide to the terminology used in ESS. It is designed to be read in conjunction with the Act, Regulation and ESS Rule. This glossary should not be relied upon as a substitute for legal advice, and does not override the true definitions of these terms in the Act, Regulations or ESS Rule.

Term	Meaning
Accredited Certificate Provider (Accredited Certificate Provider)	A person accredited by the Scheme Administrator to create Energy Savings Certificates (ESCs) in respect of a Recognised Energy Savings Activity.
Act	The Electricity Supply Act 1995 which established the Energy Savings Scheme (in particular Part 9 of the Act).
Approved Corresponding Scheme	A scheme in another jurisdiction that the Minister has determined to be an Approved Corresponding Scheme on the basis of it having similar objectives to the ESS and an equivalent compliance regime to the ESS. Once a scheme is determined to be an Approved Corresponding Scheme, persons may carry out Recognised Energy Savings Activities that are approved under the Approved Corresponding Scheme and create Energy Savings Certificates (ESCs).
Base Penalty Rate	Is listed in Schedule 5A of the ESS Rule, and is $24.50 for 2009.
Baselines	The level of energy consumption, or energy intensity against which improvements are measured, and from which the calculation of Energy Savings Certificates are made.
Carbon Dioxide Equivalent(CO2-e)	The standard unit for the quantification of all greenhouse gases. One Energy Savings Certificate represents the energy savings equivalent to the abatement of one tonne of carbon dioxide equivalent.
Certificate Conversion Factor	Is listed in Schedule 5B of the Act as 1.06, and is used to convert the number of MWh of Energy Savings from a Recognised Energy Savings Activity to tonnes of carbon dioxide equivalent. This is done by multiplying the MWh saved by the Certificate Conversion Factor.

Term	Meaning
Confidence Factor	A factor applied, when calculating the number of Energy Savings Certificates using either the Project Impact Assessment Method or the Metered Baseline Methods, that reflects that the accuracy of Accredited Certificate Provider's methodology. A more accurate methodology will generally result in a higher Confidence Factor, and a larger number of certificates.
Consumer Price Index (CPI)	Is the Consumer Price Index (All Groups Index) for Sydney. Under the Energy Savings Scheme, the Scheme Penalty Rate is adjusted, prior to the commencement of each calendar year, by the CPI, to give the adjusted Penalty Rate for that calendar year.
Default Savings Factors	A default figure which may be used to calculate the number of Energy Savings Certificates (ESCs) for each activity listed in Schedule A of the ESS Rule. The use of Default Savings Factors allows all the energy savings associated with the activities listed in Schedule A to be brought forward to the point at which the activity takes place.
end-user equipment	end-user equipment refers to the electricity consuming equipment, processes, or systems, including equipment directly consuming electricity and any other equipment which controls or influences the consumption of electricity.
Energy Saver	The person contractually liable for the energy consumed by the end-user equipment or site that is the subject of a Recognised Energy Savings Activity (RESA), or the person nominated in writing to be the Energy Saver in respect of a RESA.
Energy Savings	Energy Savings refers to the calculated reduction in electricity consumption arising from a Recognised Energy Savings Activity (RESA) and calculated according to the ESS Rule.
Energy Savings Certificate (ESC)	A transferable certificate under part 9 of the Act, which is created in accordance with the ESS Rule. A certificate represents the Energy Savings associated with the abatement of one tonne of carbon dioxide equivalent (tCO2-e).
Energy Savings Regulations	The NSW Electricity Supply (General) Amendment (Energy Savings) Regulation 2009.
Energy Savings Scheme Rule	The Energy Savings Scheme Rule of 2009 published by the Minister for Energy, sets out the primary eligibility requirements, calculation methodologies and arrangements for the creation of Energy Savings Certificates.
Energy Savings Target	The Energy Savings Target refers to a figure, specified in Schedule 5 of the Act, that is applied to the total Liable Acquisitions in NSW to determine each Scheme Participant's Individual Energy Savings Target for each calendar year.

Term	Meaning
ESC Entitlement Date	The date an ESS application for accreditation is accepted as being viably lodged by the Scheme Administrator, and once accredited, the date from which an Accredited Certificate Provider may create ESCs.
Energy Savings Shortfall	If a Scheme Participant fails to surrender enough Energy Savings Certificates to meet its Individual Energy Savings Target for the year, it has an Energy Savings Shortfall for that year and is liable to pay a penalty for each Energy Savings Certificate it has failed to surrender.
Exempt Electricity Load	An Exempt Electricity Load is the load attributed to a person or class of person which has been granted partial exemption (90% or 60%) from the scheme by the Minister.
Implementation Date	The Implementation Date is the date on which the Energy Savings from the Recognised Energy Savings Activity (RESA) commences.
Individual Energy Savings Target	The Individual Energy Savings Target is the number of Energy Savings Certificates (ESCs) which a Scheme Participant must surrender each year to meet its obligations under the Energy Savings Scheme. This target is determined by multiplying the Energy Savings Scheme Target for that year by the total liable acquisitions in that year and the certificate conversion factor.
Liable Acquisition	Is any purchase of electricity by a Scheme Participant which is purchased from the Market Operator, or from parties not registered with the Market Operator for supply to end users in NSW whose loads have not been listed as Exempt Electricity Loads.
Market Operator	Is the entity responsible for the administration and operation of the wholesale national electricity market in accordance with the National Electricity Law (currently the Australian Energy Market Operator (AEMO)).
National Australian Built Environment Rating System (NABERS)	Is a ratings methodology administered by the NABERS Administrator (currently the Department of Environment, Climate Change and Water (DECCW)) which can be used to calculate Energy Savings under the Metered Baseline Method. The NABERS Method can be used for new or existing buildings.
Penalty Conversion Factor	Is specified in Schedule 5A of the ESS Rule, and is 0.94 for the duration of the Scheme.
Recognised Energy Savings Activity (RESA)	A specific activity, approved by the Scheme Administrator, which is implemented by an Energy Saver and increases the efficiency of electricity consumption or reduces electricity consumption with no negative effect on production or service levels.
Retail Supplier	A Scheme Participant under the Energy Savings Scheme. Includes all holders of an electricity retail licence in NSW.

Term	Meaning
Scheme Administrator	The body responsible for administering functions such as accrediting Accredited Certificate Providers, verifying Energy Savings activity and maintaining a registry of certificates. The NSW Independent Pricing and Regulatory Tribunal (IPART) is the Scheme Administrator for the Energy Savings Scheme.
Scheme Participant	A person who is required to comply with an Individual Energy Savings Target. Scheme Participants include all Retail Suppliers of electricity in NSW, any person directly supplying a customer in NSW or any person directly purchasing electricity from the Market Operator (other than a Retail Supplier).
ESS Penalty Rate	Is calculated by multiplying the Base Penalty Rate per MWh by the Penalty Conversion Factor. The ESS Penalty Rate is the amount per certificate that is applied to a Scheme Participant's Energy Savings Shortfall to calculate the monetary penalty as a result of the shortfall. The ESS Penalty Rate is listed in Schedule 5A of the Act.
Scheme Registry	An online registry of Accredited Certificate Providers and Energy Savings Certificates.
Scheme Regulator	The body that monitors the compliance of Scheme Participants with their Individual Energy Savings Targets under the Act. The NSW Independent Pricing and Regulatory Tribunal (IPART) is the Scheme Regulator for the Energy Savings Scheme.
Site	A Site refers to all the End end-user equipment for which the electricity consumed is measured by the same utility meter allocated a National Meter Identifier (NMI) under the National Electricity Law, or by other meters or logging devices approved by the Scheme Administrator.