



Review of the NSW Energy Savings Scheme

Final Statutory Review Report

June 2015



The new state of business

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Executive Summary

The main findings of the Statutory Review Report are as follows.

Objective 1 - to create a financial incentive to reduce the consumption of electricity by encouraging energy saving activities

Evidence that the ESS has created a financial incentive to reduce the consumption of electricity and encouraged energy saving activities includes:

- accredited certificate providers created 8.8 million energy savings certificates between 2009 and 2013 equivalent to around 8291 gigawatt hours of electricity saved over the life of the implemented energy efficiency activities
- scheme participants chose to purchase certificates rather than pay penalties for 92 per cent of their obligation under the Act between 2009 and 2013, providing a financial incentive for accredited certificate providers to create certificates for energy efficiency activities
- the weighted average price for certificates from 2009 and 2013 was \$24.02, well above the estimated \$2.72 administrative cost to create them, indicating that the financial incentive was directed to implementing energy efficiency activities and not program administration.

There is also evidence that the objective remains valid and there is a continued need for a financial incentive to encourage energy savings activities. Market barriers to energy efficiency still persist, including information gaps, a lack of skills and time, high upfront costs and split incentives.

The NSW Government proposes to amend Objective 1 to refer to energy rather than electricity only. Research commissioned by Office of Environment and Heritage also identified highly cost effective opportunities to save more than 6.5 PJ of gas each year and market barriers to the efficient use of electricity are the same for gas.¹

Objective 2(a) - to assist households and businesses to reduce electricity consumption and electricity costs

There is evidence that the ESS has been effective in assisting households and businesses to reduce electricity consumption and costs. This includes that:

- between the 2009 and 2013 compliance years, accredited certificate providers created certificates for energy savings activities in the residential (0.7 million certificates or 701 gigawatt hours), commercial (6.7 million certificates or 6333 gigawatt hours) and industrial (1.3 million certificates or 1182 gigawatt hours) sectors²
- measurement and verification of savings from similar activities under other NSW energy efficiency programs has proven that energy efficiency measures can reduce energy consumption in line with engineering estimates³
- actual energy savings from the projects implemented under the ESS between the 2009 and 2013 compliance years are estimated to be worth \$1.2 billion to the participating households and businesses over their project lifetimes.

There is evidence that this objective remains valid. There are substantial energy efficiency opportunities for households and businesses to reduce their consumption and costs and energy bill pressures remain for many customers due to relatively high energy prices.

¹ Office of Environment and Heritage analysis based on Energetics, 2014, *Energy Efficiency Opportunity Model: Version 1.0*, see Figure 9 and Appendix A of **Part 2: Options Paper** for further details

² ESS Registry data for certificates created before 1 July 2014

³ See <http://www.environment.nsw.gov.au/energyefficiencyindustry/evaluation.htm>

As with *Objective 1*, The NSW Government proposes to amend *Objective 2(a)* to refer to energy rather than electricity.

Objective 2(b) - to complement any national scheme for carbon pollution reduction by making the reduction of greenhouse gas emissions achievable at a lower cost

Evidence that the ESS has complemented national schemes by making emissions reductions achievable at a lower cost includes:

- the predicted abatement task required to meet Australia's 2020 emissions reduction target has reduced from 166 MtCO₂-e to 131 MtCO₂-e in 2020, in part from a reduction in greenhouse gas emissions trends from the NSW energy sector⁴
- the estimated actual energy savings from the ESS will have contributed 0.9 MtCO₂-e in annual reductions in 2020.⁵

This objective continues to remain valid as there continues to be national schemes and commitments with the objective of reducing carbon emissions. The Australian Government has committed to reduce greenhouse gas emissions by 5 per cent below 2000 levels by 2020 by using the Emissions Reduction Fund to help achieve this goal. Submissions received were generally supportive of the ESS operating in parallel with the Emissions Reduction Fund. Given the early stages of the Emissions Reduction Fund, its overall impact is still unclear.

The NSW Government and Commonwealth Government are working together to ensure the ESS and Emissions Reduction Fund are complementary, to prevent double counting of energy savings.

Objective 2(c) - to reduce the cost of, and the need for, additional energy generation, transmission and distribution infrastructure

Evidence that the ESS has reduced the cost of and the need for additional energy generation, transmission and distribution infrastructure includes:

- energy efficiency programs, including the ESS have contributed to the decline in demand growth for electricity in NSW
- a reduction in demand growth for electricity in NSW has helped to postpone the timeframe when new energy generation infrastructure would be required
- transmission and distribution network service providers have downgraded their investment in avoidable infrastructure during and since the 2009-2014 period, citing energy efficiency as a contributing factor
- Ausgrid now includes the ESS in its forecasts for energy consumption and peak demand.⁶

There is evidence that the objective remains valid and there is a continued need to reduce the cost of, and the need for, additional energy generation, transmission, and distribution infrastructure. Existing NSW power generation capacity is aging and is likely to retire over the next two decades meaning that alternative sources of supply and/or reductions in demand will be required. The ESS can help to reduce the amount of generation capacity required in the future and avoid the need for consumers to pay for these costs. In the context of relatively stable demand, greater energy efficiency can also help defer investment in long-life network assets until there is a more certain need, reducing the risk of stranded network assets.

⁴ Commonwealth Department of Environment, 2013, Australia's Abatement Task and 2013 Emissions Projections

⁵ Analysis by the Office of Environment and Heritage based on the deemed lifetime of activities undertaken to create certificates and projected emissions intensity of electricity

⁶ Ausgrid, 2014, Regulatory Proposal: 1 July 2014 to 30 June 2019,

Introduction

The Minister for Industry, Resources and Energy is required under Section 175 of the *Electricity Supply Act 1995* (the Act) to review the operation of the ESS to determine whether the policy objectives of the scheme remain valid and whether the terms of Part 9 of the Act remain appropriate for securing those objectives. The objectives of the Scheme are:

“98 Objects of Part

- (1) *The principal object of this Part is to create a financial incentive to reduce the consumption of electricity by encouraging energy saving activities.*
- (2) *The other objects of this Part are:*
 - (a) *to assist households and businesses to reduce electricity consumption and electricity costs, and*
 - (b) *to complement any national scheme for carbon pollution reduction by making the reduction of greenhouse gas emissions achievable at a lower cost, and*
 - (c) *to reduce the cost of, and the need for, additional energy generation, transmission and distribution infrastructure.”*

The Act specifies that the first review is to be undertaken as soon as possible after the end of the period of five years from 1 July 2009 and that a report on the outcome of the review is tabled in each House of Parliament within 12 months after the end of the period. Therefore the first statutory review was triggered on 1 July 2014 with the report due to be tabled before 1 July 2015.

Call for submissions

On 21 April 2015, the Minister for Industry, Resources and Energy and the Minister for the Environment jointly released the ESS Review Report Package. The package comprised three components as follows:⁷

- An Overview which provided an executive summary of the ESS Review
- Part 1: Draft Statutory Review Report which examined the scheme's performance during its first five compliance years from 2009 to 2013. It identified the Government's initial findings on the validity of the policy objectives of the scheme and whether the terms of Part 9 of the Act remain appropriate
- Part 2: Options Paper which provided further details on how the NSW Government intends to implement the reforms announced in November 2014 and presents options on how the scheme could be enhanced to better meet the scheme's objectives.

The NSW Government called for submissions from all interested parties specifically requesting *Is there any other evidence that should be considered that would indicate whether or not the objectives of the ESS are being met and remain valid?*

On 6 May 2015, the Office of Environment and Heritage and NSW Trade & Investment held a public forum with 149 stakeholders from 102 organisations registering interest. The purpose of the information session was to inform stakeholders about the proposed reforms to improve the quality and quantity of submissions. The consultation period closed on 18 May 2015.

A total of 25 stakeholders made written submissions on the ESS Statutory Review. Submissions are available on the NSW Trade & Investment website (see www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainableenergy/efficiency/scheme).

Submissions marked as 'confidential' have not been published.

⁷ <http://www.resourcesandenergy.nsw.gov.au/energy-consumers/sustainable-energy/efficiency/scheme/energy-saving-scheme-review>

Objective 1

Objective 1 of the Act is to create a financial incentive to reduce the consumption of electricity by encouraging energy saving activities.

The objective is being met

Evidence shows that the objective is being met, as:

- certificates have been created by accredited certificate providers for energy savings activities
- scheme participants have chosen to purchase certificates rather than pay penalties indicating that accredited certificate providers had a financial incentive to create certificates
- the price paid for certificates is higher than the administrative cost of creating them indicating that the financial incentive was for energy efficiency activities rather than program administration.

Certificates have been created

IPART reported that 8.826 million certificates were created by eligible energy saving activities since the ESS commenced in 2009 and the end of the 2013 compliance year.⁸

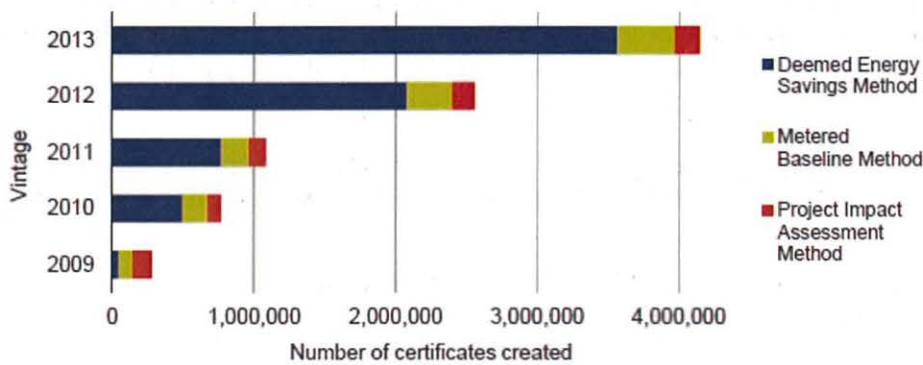


Figure 1 Creation of certificates by calculation method and vintage⁹

Participants are purchasing certificates

⁸ IPART compliance reports to the Minister for the year 2013 accessed at http://www.ess.nsw.gov.au/How_the_scheme_works/Scheme_Performance

⁹ IPART compliance reports to the Minister for the year 2013 accessed at http://www.ess.nsw.gov.au/How_the_scheme_works/Scheme_Performance

Table 1 below shows that Scheme participants have largely chosen to purchase certificates rather than pay penalties. By generating over 8.826 million certificates (outlined above), scheme participants exceeded the target of 6.868 million certificates and paid penalties for the equivalent of only 568 089 certificates. Penalties paid represent roughly 8 per cent of the overall obligation over the first five years of the Scheme. Furthermore, in the 2012 and 2013 compliance years no penalties were paid.

Table 1 Penalties paid by scheme participants in the ESS¹⁰

Compliance year	Number of scheme participants that paid penalties	Total penalties in certificates	Total penalties in dollars (approximate)	Annual targets in certificates
2009	3	347	\$8,000	305,174
2010	8	316,952	\$7,300,000	858,004
2011	4	250,790	\$6,000,000	1,414,315
2012	0	0	0	1,857,069
2013	0	0	0	2,433,461
Total	n/a	568,089	\$13,308,000	6,868,023

Certificate prices

The actual certificate price paid by scheme participants is not recorded or reported. There is survey-based evidence published by IPART suggesting the price paid for certificates is generally above the administrative cost of creating them.

In 2012 and 2013, IPART commissioned a survey of scheme participants and accredited certificate providers to identify the costs of participating in the scheme. Based on the interviewed sample, the 2012 total cost per ESC created is estimated at between \$14.84 and \$21.70 while the sale price per ESC is higher at \$25.36. This study also found that in 2012, administration and compliance costs for accredited certificate providers were \$2.74 per certificate. These costs were lower in 2010 and 2009.¹¹

Figure 2 shows the spot price for certificates as reported by Next Generation Energy Solutions. Certificate prices have fluctuated widely between 2009 and 2013 from around \$10 to \$32 per certificate. It also shows that these prices correlate with periods of relative over and undersupply of certificates to meet annual targets.

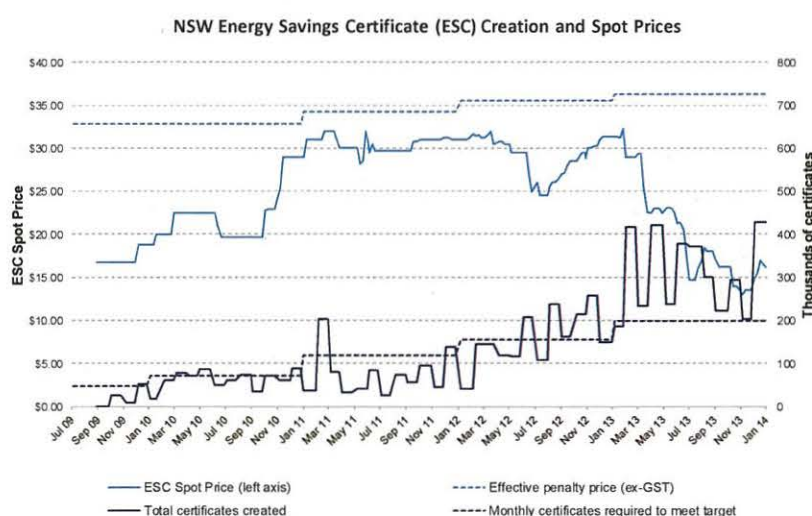


Figure 2 Certificate targets, penalty rates, certificate spot prices and certificate supply^{12,13,14}

¹⁰ IPART compliance reports to the Minister for the years 2009, 2010, 2011, 2012 and 2013 accessed at www.ess.nsw.gov.au/How_the_scheme_works/Scheme_Performance

¹¹ Databuild, 2013, Energy Savings Scheme Cost of Participation Report 2013, prepared for IPART, accessed at http://www.ess.nsw.gov.au/Certificate_market/ESS_market_research_reports

¹² IPART compliance reports to the Minister for the years 2009, 2010, 2011, 2012 and 2013 accessed at http://www.ess.nsw.gov.au/How_the_scheme_works/Scheme_Performance

This evidence demonstrates that accredited certificate providers are creating certificates, scheme participants are purchasing these certificates rather than paying penalties, and these certificates are being sold at prices higher than the cost to create them. This demonstrates that the ESS has been effective in creating a financial incentive to save electricity.

The objective remains valid

There is a continued need for a financial incentive to encourage energy savings activities because:

- there is still a significant opportunity to save electricity through energy efficiency in NSW
- market barriers to energy efficiency have not been removed.

However, there is evidence that the objective should be reformed so that the scheme can also support gas saving projects.

Energy efficiency opportunity

Office of Environment and Heritage research has found that 28 per cent of NSW energy use can be avoided through energy efficiency.¹⁵ This figure far exceeds the opportunity that will be realised with the current ESS target of 5 per cent.

The oversupply of certificates in 2012 and 2013 also indicates that the energy efficiency opportunity for NSW is larger and cheaper than originally forecast.

There is also evidence to suggest that energy efficiency opportunities will continue to grow over time. For example, the US Environmental Protection Agency describes this opportunity in the US:

“The opportunity presented for economic investment in EE [energy efficiency] is dynamic, growing over time as technologies and practices advance, as populations grow, and as investment occurs in the construction of new homes, buildings, and industrial facilities. As new policies are enacted, leading to the acceleration of investment in EE, an additional portion of the expanding opportunity is realized. After decades of experience implementing policies to accelerate investment in cost effective energy efficiency, states are finding renewed opportunities as they develop more sophisticated and effective strategies (...).”¹⁶

The US Environmental Protection Agency found that state based energy efficiency programs should aim to deliver “incremental savings” of between half a per cent and one percent of energy retail sales each year in order to realise the cost effective energy efficiency opportunity.¹⁶ This is equivalent to an annual target of between five per cent and ten per cent in a scheme that rewards activities with ten years of energy savings upfront (such as the ESS).

Section 2.2 (Targets) and **Section 2.4** (scheme duration) of the **Options Paper** provides further details on the ongoing opportunity to save electricity.

Market barriers

The NSW Energy Efficiency Action Plan (EEAP) outlines a series of market barriers to the uptake of cost effective energy efficiency:

- information gaps for consumers

¹³ Certificate creation data from the Energy Savings Scheme Registry, accessed: www.ggas-registry.nsw.gov.au

¹⁴ Spot price data sourced from *The Green Room*, published by Next Generation Energy Solutions (NGES) (see www.nges.com.au). Note this data accounts only for certificates traded through NGES and may not be wholly representative of the price paid by certificate buyers. The NSW Government recommends that persons seek independent advice before buying or selling certificates, and cautions against making decisions based solely on this information.

¹⁵ Office of Environment and Heritage, NSW Energy Efficiency Action Plan accessed at <http://www.environment.nsw.gov.au/resources/energyefficiencyindustry/130588-energy-efficiency-action-plan.pdf>

¹⁶ US Environmental Protection Agency, June 2014, *Clean Power Plan Proposed Rule - Technical Support Document: GHG Abatement Measures*, accessed at: <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-ghg-abatement-measures.pdf>

- lack of skills and time
- high upfront costs for energy efficient products
- split incentives between equipment owners and users
- data as a public good.¹⁷

These market barriers mirror those identified by the Productivity Commission.¹⁸

The EEAP recommends that the best way to overcome these barriers is a suite of government programs, including a large scale, long-term, market-based scheme such as the ESS to provide the certainty required for the private sector to develop energy efficiency products and services for households and businesses that are scalable and sustainable.

Analysis of reporting under the Energy Efficiency Opportunities by ClimateWorks Australia predicted that less than 30 per cent of the cost effective electricity efficiency opportunities would be taken up by large energy users due to market barriers.¹⁹

Objective 1 is still valid as there is evidence of significant opportunity to save energy through energy efficiency and there remains a need for financial incentives to help overcome persistent market barriers to energy efficiency.

Opportunities to save gas and market barriers

The ESS cannot currently fund gas efficiency projects. However, evidence suggests that there are significant opportunities for gas efficiency in NSW, with modelling estimating that there are more than 6000 TJ of cumulative gas savings opportunities each year under a levelised cost of less than \$5 per GJ.²⁰

Gas prices are also predicted to increase significantly between 2014-15 and 2015-16, with modelling showing an increase of between \$0.75 and \$3.50 per GJ on current contracts.²¹ Residential and small business customers will see annual bill increases estimated at \$81 and \$378 in 2014–15 and 2015–16 respectively.²² Households and businesses will need to adjust to these prices.

The analysis of reporting under the Energy Efficiency Opportunities by ClimateWorks Australia mentioned above also predicted that less than 40 per cent of the cost effective gas efficiency opportunities would be taken up by large energy users due to market barriers.²³

These findings mirror the experience from the NSW Energy Savings Action Plans, where reporting companies implemented less than a quarter of identified cost effective gas efficiency opportunities over their five year reporting period.²⁴

This evidence suggests that while the objective may remain valid, it could be enhanced by expanding the scheme to support gas efficiency.

¹⁷ Office of Environment and Heritage, NSW Energy Efficiency Action Plan accessed at <http://www.environment.nsw.gov.au/resources/energyefficiencyindustry/130588-energy-efficiency-action-plan.pdf>

¹⁸ Productivity Commission, 2005, *Private Cost Effectiveness of Improving Energy Efficiency*, accessed at <http://www.pc.gov.au/inquiries/completed/energy-efficiency/report/energy.pdf>

¹⁹ ClimateWorks Australia, 2012, Inputs to the Energy Savings Initiative modelling from the Industrial Energy Efficiency Data Analysis Project, prepared for the Commonwealth Department of Industry

²⁰ Office of Environment and Heritage analysis based on Energetics, 2014, Energy Efficiency Opportunity Model: Version 1.0, see Appendix A of Part 2: Options Paper for further details

²¹ Jacobs SKM, 2014, *New Contract Gas Price Projections*, prepared for IPART, 4 April 2014, available at [www.ipart.nsw.gov.au/Home/Industries/Gas/Reviews/Retail Pricing/Changes in regulated gas retail prices from 1 July 2014 - Consultant Report/Jacobs SKM - New contract gas price projections - April 2014](http://www.ipart.nsw.gov.au/Home/Industries/Gas/Reviews/Retail Pricing/Changes in regulated gas retail prices from 1 July 2014/23 Apr 2014 - Consultant Report/Jacobs SKM - New contract gas price projections - April 2014)

²² Independent Pricing and Regulatory Tribunal, 2014, *Changes in Regulated Retail Gas Prices from 1 July 2014: Gas - Final Report*, available at www.ipart.nsw.gov.au/Home/Industries/Gas/Reviews/Retail Pricing/Changes in regulated gas retail prices from 1 July 2014

²³ ClimateWorks Australia, 2012, Inputs to the Energy Savings Initiative modelling from the Industrial Energy Efficiency Data Analysis Project, prepared for the Commonwealth Department of Industry

²⁴ Analysis by the Office of Environment and Heritage of company reports from the Energy Savings Actions Plans program.

Outcome of consultations

Submissions received were generally in support of the findings of the draft Statutory Review and did not propose major changes to the analysis or further evidence that may be relevant.

Four submissions, mainly from the gas distribution industry suggested that the objectives of the ESS should be amended to focus on emissions reduction to align the ESS with the Victorian Energy Efficiency Target and reduce compliance complexity for national organisations.

Final finding

The Review recommends that the NSW Government expand the ESS to support gas efficiency. To enable this, a legislative amendment is required to Objective 1. The proposed wording would be as follows [amendment highlighted in **bold**].

*“Objective (1) - The principal object of this Part is to create a financial incentive to reduce the consumption of **energy** by encouraging energy saving activities.”*

Objective 2(a)

Objective 2(a) is to assist households and businesses to reduce electricity consumption and electricity costs.

The objective is being met

There is evidence that the ESS has been effective in assisting households and businesses to reduce electricity consumption and costs as:

- certificates have been created for energy savings activities in the residential, commercial and industrial sectors
- measurement and verification of savings from similar activities under NSW programs has proven that energy efficiency measures reduce energy consumption
- actual energy savings estimated by IPART have a significant financial value to the participating households and businesses.

Energy savings activities

The ESS has driven a range of energy savings projects for households and businesses since it commenced in 2009. Certificates have been created across the residential, commercial and industrial sectors for a range of energy efficiency projects, helping to reduce electricity consumption and costs.

Figure 3 presents a breakdown of certificates created by year, sector and technology type.

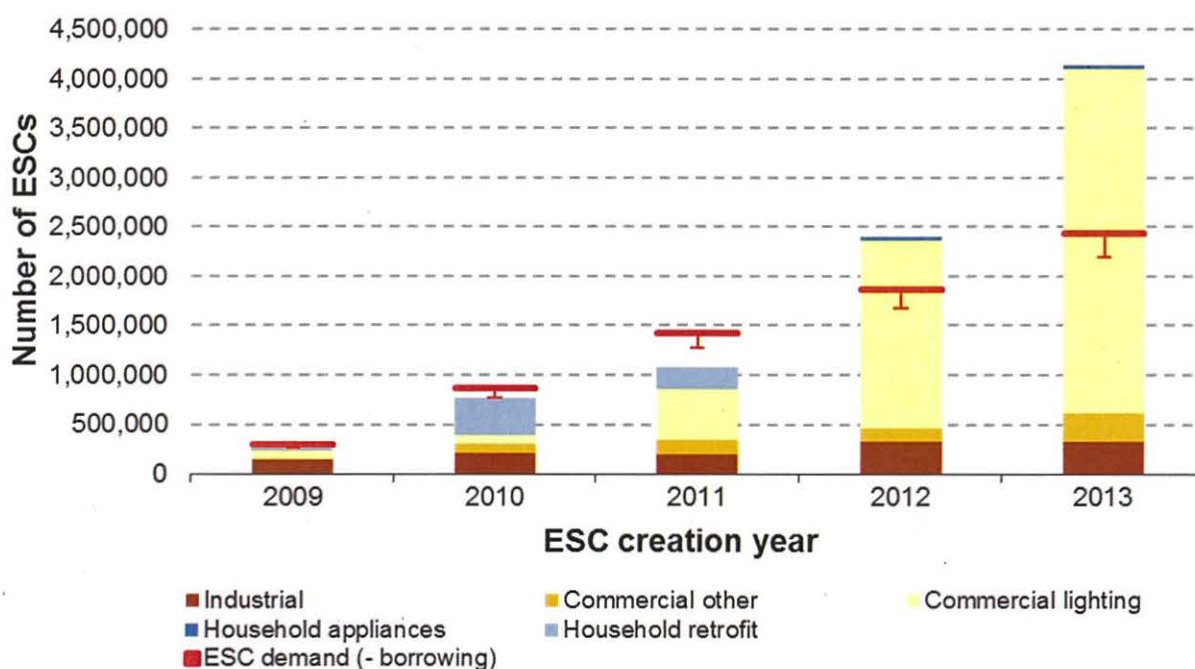


Figure 3 Number of certificates created by year, sector and technology type

Evidence from other NSW programs

The 2012 Evaluation Report on NSW Energy Efficiency Programs found that energy savings had been achieved and these were expected to increase, with all NSW direct energy savings programs

having delivered substantial energy savings. These energy savings had been cost-effective and were delivered at a lower cost than the cost of providing the same amount of electricity.²⁵

Actual energy savings

Table 2 shows IPART estimates of actual energy savings delivered by the ESS from 2009 to 2013. The data below demonstrates that the ESS has directly contributed a reduction in NSW electricity consumption, across the residential, commercial and industrial sectors.

Table 2 Estimated actual energy savings from the ESS

Calculation method	Unit	2009	2010	2011	2012	2013
Project Impact Assessment Method	MWh	36,880	79,944	98,573	119,610	138,907
Deemed Energy Savings	MWh	3,001	63,755	146,374	347,086	685,327
Metered Baseline	MWh	88,868	159,123	175,024	301,170	382,340
Total estimated energy savings	MWh	128,749	302,821	419,971	767,866	1,206,574

The estimated financial value of these energy savings is around \$385 million in energy bill savings for households and businesses up until the end of June 2014. The projects that have been implemented with the assistance of the ESS between 2009 and 2013 are expected to return \$1.2 billion in bill savings over their lifetimes.

The objective is still valid

Evidence that the objective remains valid includes the following:

- substantial energy efficiency opportunities remain to assist households and businesses to reduce their electricity consumption and costs
- energy bill pressures remain for many customers due to high energy costs relative to income.

Energy efficiency opportunities

There are substantial energy efficiency opportunities remaining to assist households and businesses to reduce their electricity consumption and costs. Both 2012 and 2013 saw significant certificate oversupply with 38 per cent more certificates created than required to meet targets in 2012,²⁶ and 70 per cent more certificates than required to meet targets in 2013.²⁷ This suggests that the energy efficiency opportunity is likely to be larger and cheaper than originally estimated.

In addition, analysis prepared for the NSW government suggests that there are opportunities across the NSW economy to save more than 6000 TJ of gas per annum at a levelised cost of less than \$5 per GJ.²⁸ Further, energy efficiency opportunities will continue to grow and energy efficiency will continue to deliver benefits beyond 2020. Further information on the energy efficiency opportunity in NSW can be found in Sections 2 and 3 of the Options Paper.

²⁵ ARTD Consultants, 2012, *NSW Energy Efficiency Programs 2012 Evaluation Report*, accessed at <http://www.environment.nsw.gov.au/resources/energyefficiencyindustry/140052eevrep.pdf>

²⁶ IPART, 2013, *Compliance and Operation of the NSW Energy Savings Scheme during 2012: Report to the Minister*, accessed at http://www.ess.nsw.gov.au/files/3c52c1d3-f61c-427a-926e-a23800bc22ac/Annual_Report_to_the_Minister_2012.pdf

²⁷ IPART, 2014, *Compliance and Operation of the NSW Energy Savings Scheme during 2013: Report to the Minister*.

²⁸ Office of Environment and Heritage analysis based on Energetics, 2014, *Energy Efficiency Opportunity Model: Version 1.0*, see Figure 9 and Appendix A of Part 2: Options Paper for further details

Energy bill pressures

Figure 4 below shows the increase in Sydney electricity prices in relation to consumer price index. It is clear that energy bill pressures have significantly increased over the past ten years. These pressures are felt more acutely by vulnerable low-income households, who have spent an increasingly large proportion of their income on energy and who also face more acute barriers to energy efficiency than typical households and businesses (see Sections 4.1 and 4.2 of the Options Paper for more information). As long as these pressures remain, the objective is still valid.

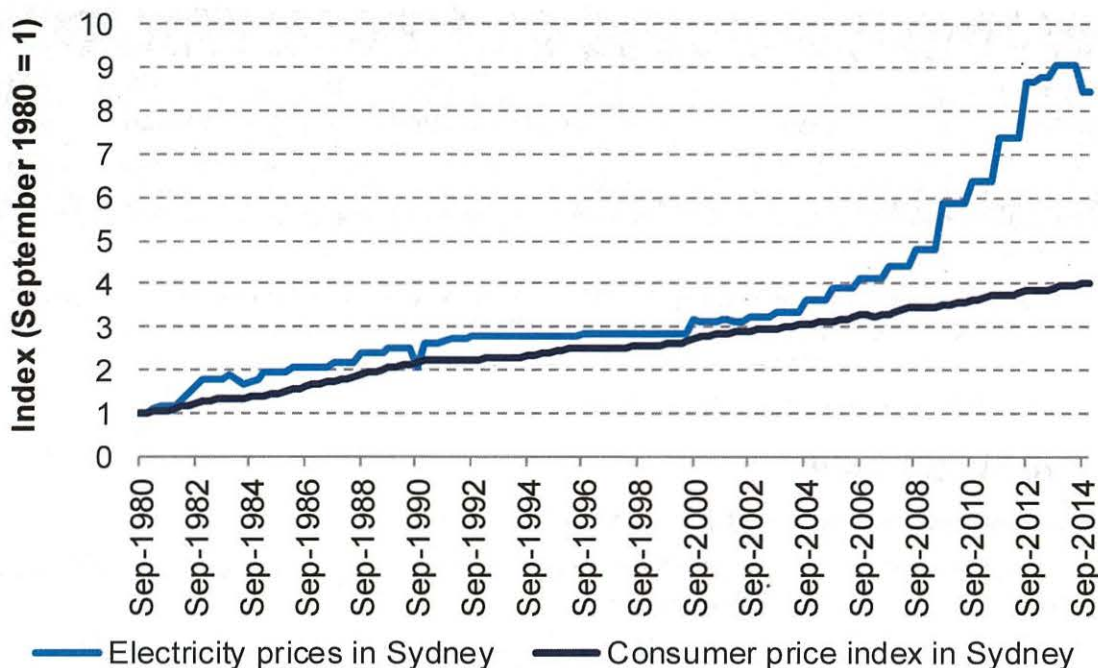


Figure 4 Sydney electricity price increases and inflation

Outcome of consultations

Submissions that were received were generally in support of the findings of the draft Statutory Review and did not propose major changes to the analysis or further evidence that may be relevant.

A number of submissions raised their concerns that the benefits of the ESS were weighted towards businesses over households. The NSW Government has implemented a number of reforms to the ESS to share the benefits of the ESS across businesses and households.

In 2013, the NSW Government released the NSW Energy Efficiency Action Plan including commitments to expand the access to the Energy Savings Scheme. The NSW Government made enhancements to the ESS Rule in 2014 to provide simple methods to access financial incentives for households and small businesses.

A number of stakeholder comments suggest improvements to these methods to reduce transaction costs. These suggestions will be considered as part of future changes to the ESS Rule.

The NSW Government has also committed to introduce a regional network factor that would provide a level playing field for regional customers by recognising the additional benefits from saving energy in regional NSW.

Final finding

The Review recommends that the NSW Government expand the ESS to allow gas efficiency activities access financial incentives from 2016. This requires a legislative amendment to Objective 2(a). The proposed wording is as follows [amendment highlighted in **bold**].

*Objective 2(a) - to assist households and businesses to reduce **energy** consumption and **energy** costs*

Objective 2(b)

Objective (2) (b) of the Act is to complement any national scheme for carbon pollution reduction by making the reduction of greenhouse gas emissions achievable at a lower cost.

The objective is being met

There is evidence that the ESS has complemented national schemes by making emissions reductions achievable at a lower cost as:

- the abatement task required to meet Australia's target has reduced with a reduction in greenhouse gas emissions trends from the NSW energy sector
- the actual energy savings from the ESS have contributed to these reductions.

Reduced abatement task

The Australian Government has committed to reduce greenhouse gas emissions 5 per cent below 2000 levels by 2020. Through the Emissions Reduction Fund the cost of achieving greenhouse gas emissions is determined by the amount of reduction required and the price required to encourage the reduction.

In 2013, the Commonwealth Department of Environment reduced its projections for the cumulative abatement task required to achieve Australia's 5 per cent emission reduction target from 166 Mt CO₂e to 131 Mt CO₂e in 2020. One factor contributing to causing this reduction is lower than originally projected demand for electricity.²⁹

Greenhouse gas emissions from the energy sector in NSW peaked in 2008 and in 2012 were 9.8 MtCO₂e lower than the trend from 1999 to 2008. This is shown in **Figure 4** below.

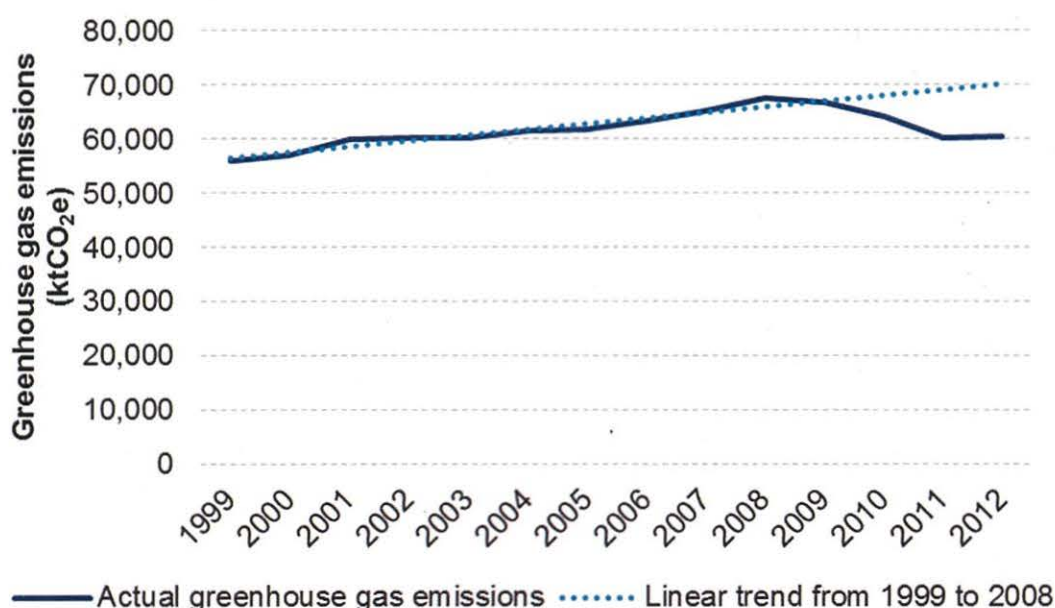


Figure 4 National Greenhouse Inventory reported greenhouse gas emissions from the NSW energy sector

²⁹ Commonwealth Department of Environment, 2013, *Australia's Abatement Task and 2013 Emissions Projections*, accessed at http://www.environment.gov.au/system/files/resources/51b72a94-7c7a-48c4-887a-02c7b7d2bd4c/files/abatement-task-summary-report_1.pdf

Over the period from 2009 to 2013, the emissions intensity of NSW electricity has remained relatively constant.^{30,31} This indicates that the reduction in emissions from NSW electricity generation is almost entirely due to a decrease in generation of electricity driven by reduced demand, rather than a change in the energy generation mix.

Actual energy savings and projected abatement from the ESS

Table 3 below shows the actual energy savings from the ESS for electricity as estimated by IPART. Based on the historical full fuel cycle emissions intensity of NSW electricity from the National Greenhouse Accounts the ESS reduced emissions by a total of 2.8 MtCO₂e across the four years from 2009 to 2013.

Table 3 Estimated actual energy savings and emissions reductions from the ESS

Calculation method	Unit	2009	2010	2011	2012	2013
Project Impact Assessment Method	MWh	36,880	79,944	98,573	119,610	138,907
Deemed Energy Savings	MWh	3,001	63,755	146,374	347,086	685,327
Metered Baseline	MWh	88,868	159,123	175,024	301,170	382,340
Total estimated energy savings	MWh	128,749	302,821	419,971	767,866	1,206,574
Full fuel cycle emissions intensity	tCO ₂ e/MWh	1.01	1.01	1.01	1.00	0.99
Emissions reductions	tCO₂e	130036	305850	424170	767866	1194508

Between 2009 and 2013, accredited certificate providers created certificates for energy efficiency projects that are expected to deliver 1,125 gigawatt hours of electricity saving in 2020.³² The full fuel cycle emissions intensity of NSW electricity in 2020 is estimated to be 0.76 tCO₂e/MWh (see Appendix A of the **Options Paper**). Assuming energy savings activities persist for the number of years they are deemed for, the ESS activity from the 2009 to 2013 compliance year will have reduced Australia's annual emissions by 0.9 MtCO₂e in the year 2020.

This indicates that the ESS has reduced the abatement task required to meet Australia's emissions reduction targets and has complemented national emission reduction schemes.

The objective is still valid

There is evidence for a need to continue to complement national initiatives, as the emissions intensity of NSW electricity supply is expected to remain significant for the foreseeable future under current policy settings.

Emissions intensity

Figure 5 below shows a projection for the emissions intensity of electricity in NSW based on the forecast generation mix from the Australian Energy Market Operator's National Transmission Network Development Plan

Although the emissions intensity of NSW electricity supply is forecast to reduce between 2015 and 2020, it will still remain significantly above zero. This indicates that reducing electricity consumption will continue to reduce emissions into the foreseeable future.

³⁰ Analysis by the Office of Environment and Heritage of Australian Energy Market Operator's *Carbon Dioxide Equivalent Intensity Index* for 2011, 2012 and 2013 showed that the Scope 1 emissions intensity of NSW generation was between 0.92 and 0.93 tCO₂e/MWh. Data accessed at <http://www.aemo.com.au/Electricity/Settlements/Carbon-Dioxide-Equivalent-Intensity-Index>

³¹ Commonwealth Department of Environment, 2014, *National Greenhouse Accounts Factors July 2014*, Table 41 shows Scope 2 and 3 emissions intensity of NSW electricity reduced from 1.01 tCO₂e/MWh in 2008-09 to 0.99 tCO₂e/MWh in the latest estimate, accessed at <http://www.environment.gov.au/system/files/resources/b24f8db4-e55a-4deb-a0b3-32cf763a5dab/files/national-greenhouse-accounts-factors-2014.pdf>

³² Independent Pricing and Regulatory Tribunal, 2014, *NSW Energy Savings Scheme – Compliance and Operation in 2013*, accessed at http://www.ipart.nsw.gov.au/files/6f34b661-ae07-489c-8a2b-a38b00e9fd7c/NSW_Energy_Savings_Scheme_-_Compliance_and_Operation_in_2013_-_Annual_Report_to_the_Minister_-_July_2014.pdf

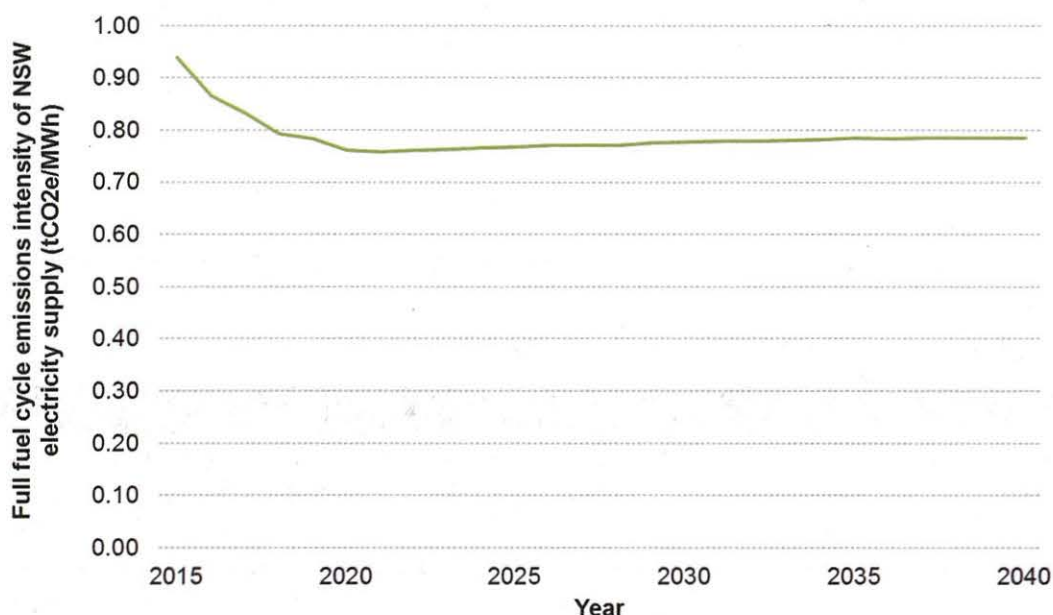


Figure 5 Forecast greenhouse gas emissions intensity of NSW electricity supply³³

The ESS and the Emissions Reduction Fund

The Commonwealth Government's Emissions Reduction Fund will fund emission abatement activities across all sectors of the Australian economy. It has the potential to support energy efficiency activities in NSW.

The Commonwealth Government has committed in the White Paper to build on existing state based energy efficiency schemes to ensure compatibility and administrative simplicity.

"The [Australian] Government will also work with state, territory and local governments to build on existing programs and develop national approaches to crediting energy savings projects. This will avoid unnecessary duplication, streamline administration and provide continuity for business."

The NSW Government supports the continuation of the ESS in parallel with the Emissions Reduction Fund. To ensure that the schemes are complementary to each other, energy efficiency projects that access the ESS are not eligible for financial incentives under the Emissions Reduction Fund.

The NSW Government is working with the Commonwealth Government to establish formal information sharing arrangements with the Clean Energy Regulator to harmonise the two schemes and prevent double counting of energy savings.

The NSW Government will monitor the effect of the Emissions Reduction Fund until operations of the scheme become settled. This monitoring would inform future reviews of the ESS targets and updates to the ESS Rule to ensure that the ESS remains complementary.

³³ Based on a capacity weighted emissions intensity of NSW generators by fuel type (e.g. coal, gas) as published in Australian Energy Market Operator, 2013, *National Transmission Network Development Plan: Zero Carbon Price Scenario Modelling Results (Microsoft Excel workbook)*, accessed at http://www.aemo.com.au/Electricity/Planning/~/_media/Files/Electricity/Planning/Reports/NTNDP/2013/2013%20NTNDP%20zero%20carbon%20price%20scenario%20modelling%20results.xlsx.ashx

Outcome of consultations

Submissions that were received were generally in support of the findings of the draft Statutory Review and supportive of the ESS operating in parallel with the Emissions Reduction Fund. The submissions did not propose major changes to the analysis or further evidence that may be relevant.

Final finding

The Review finds that this objective has been met and remains valid. No legislative amendments are required.

Objective 2(c)

Objective 2(c) of the Act is to reduce the cost of, and the need for, additional energy generation, transmission and distribution infrastructure.

The objective is being met

The ESS has contributed to the decline in demand growth for electricity in NSW, reducing the cost of and the need for additional energy generation, transmission, and distribution infrastructure. Evidence shows that:

- demand for electricity in NSW has reduced compared to business as usual, partially driven by energy efficiency programs including the ESS
- lower than expected demand has postponed the expected timeframe during which new energy generation infrastructure would be required
- NSW transmission and distribution network service providers have significantly downgraded their investment in avoidable expenditure compared to the 2009-2014 regulatory period, citing energy efficiency as a contributing factor
- Ausgrid now include energy efficiency in its demand reduction and forecasts for energy consumption, including the ESS.³⁴

Reduced electricity demand

Electricity demand in NSW has been decreasing over recent years. **Figure 6** below shows a comparison between TransGrid's forecast annual energy demand for NSW and the ACT prepared in 2009 and the Australian Energy Market Operator's forecast prepared in 2014.

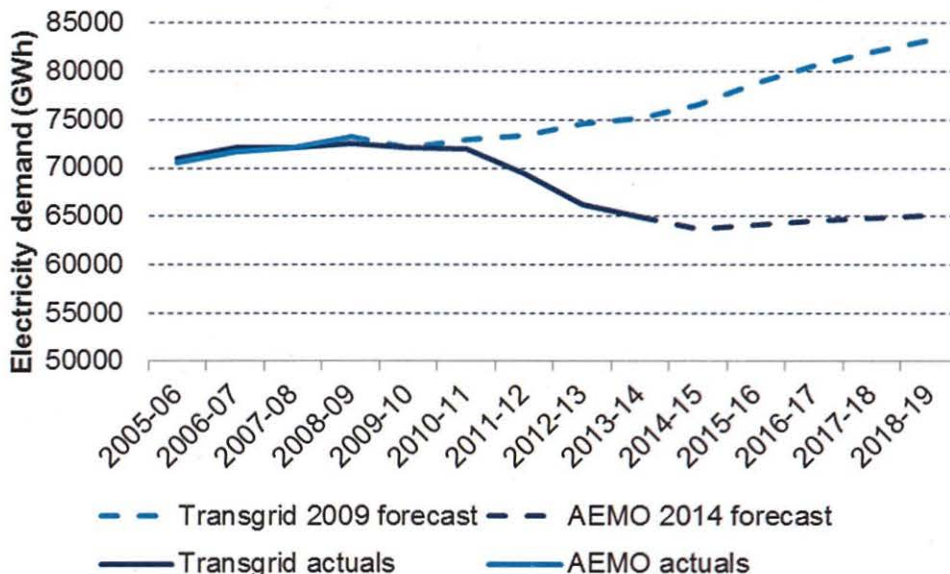


Figure 6 Comparison of projected energy demand by TransGrid in 2009 and Australian Energy Market Operator in 2014^{35,36}

³⁴ Ausgrid, 2014, Regulatory Proposal: 1 July 2014 to 30 June 2019,

³⁵ TransGrid forecasts are for electricity generation excluding auxiliary power and transmission losses taken from Table A3.1 in TransGrid, 2009, *New South Wales Annual Planning Report*, accessed at <http://www.transgrid.com.au/network/np/Documents/Annual%20Planning%20Report%202009.pdf>

The Australian Energy Market Operator noted that the growth of energy efficiency was a key driver in decreasing demand for households and businesses, thus further reducing costs.³⁷ When viewed together with the estimated annual energy savings delivered by the ESS, shown above in **Table 2**, illustrates that the ESS has assisted households and businesses to reduce electricity consumption.

Reduced need for new infrastructure

The recent plateau in NSW electricity demand has postponed the expected timeframe during which new energy generation infrastructure would have otherwise been required.³⁸ This is partially due to better than expected outcomes from energy efficiency programs, including the ESS.

In June 2014 the Australian Energy Market Operator (AEMO) published its National Electricity Forecasting Report (NEFR). This report forms the basis for the preparation of a number of forecasting tools including the Electricity Statement of Opportunities (ESOO), the Gas Statement of Opportunities (GSOO), and the National Transmission and Network Development Plan (NTNDP).

The NEFR indicates that for NSW, electricity consumption has declined by 2.8 percent per annum during the last four years. Key factors that AEMO has attributed to the reduced growth in electricity demand include energy efficiency programs and the uptake of rooftop solar photovoltaic systems.

The NEFR forecasted that for the next three years, electricity consumption in NSW is likely to decrease by 0.07 percent per annum as compared to an increase of 0.3 percent per annum in the 2013 forecasts. In the long term, for the next ten years, the average annual growth in energy consumption is likely to be 0.4 percent, which is much lower than the 0.6 percent and 1.2 percent predicted in the previous two forecasting reports.

In 2010, AEMO's ESoo forecast that NSW and the ACT would require between 27 and 285 MW of additional generation capacity as early as 2016-17.³⁹ In 2014 AEMO's ESoo forecast that due to decreasing electricity demand, no new electricity generation capacity will be required until at least 2023-24.⁴⁰ This can be attributed in part to the decline in forecasted electricity consumption from energy efficiency measures, including the ESS.

Reduced need for investment in transmission and distribution

The reduction in electricity demand has also deferred costs associated with transmission and distribution infrastructure. In its Final Decision for 2014-2019, the Australian Energy Regulator (AER) has determined that NSW transmission and distribution networks service providers are to invest \$5.23 billion in 2014 dollars between 2014 and 2019 in electricity network upgrades that could potentially be deferred or reduced with lower demand.⁴¹ This compares to \$17.4 billion in 2010 dollars in planned investments between 2009 and 2014.⁴²

³⁶ Australian Energy Market Operator forecasts are for industrial and residential and commercial demand from AEMO, 2014, National Electricity Forecasting Report 2014: NSW, accessed at http://www.aemo.com.au/Electricity/Planning/Forecasting/~/_media/Files/Other/planning/NEFR/2014/NEFR_2014_NSW_forecasts%20template_UPDATED%20tabs%20values.ashx

³⁷ AEMO, 2014, *National Electricity Forecasting Report (NEFR) 2014*, accessed at: http://www.aemo.com.au/Electricity/Planning/Forecasting/~/_media/Files/Other/planning/NEFR/2014/NEFR_FINAL_1_2014.ashx

³⁸ For further information see Hugh Saddler, 2013, *Power Down*, prepared for the Australia Institute, accessed at <http://www.tai.org.au/content/power-down>

³⁹ Australian Electricity Market Operator, 2010, *Electricity Statement of Opportunities*, accessed at: www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities, accessed at <http://www.aemo.com.au/Electricity/Planning/Archive-of-previous-Planning-reports/2010-Electricity-Statement-of-Opportunities>

⁴⁰ Australian Electricity Market Operator, 2014, *Electricity Statement of Opportunities*, accessed at: www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities

⁴¹ Avoidable network investments include capital expenditure on augmentation for increased capacity (\$1.3 billion), reliability (\$0.4 billion), and aged asset replacement (\$3.8 billion). These figures have been estimated based on the AER's Final Decisions for NSW transmissions and distribution network service providers for the 2014 to 2019 determination period.

Australian Energy Regulator, 2015, *FINAL DECISION Ausgrid distribution determination 2015-16 to 2018-19 Attachment 6 – Capital expenditure*, Table 6-2, accessed at <http://www.aer.gov.au/sites/default/files/AER%20-%20Final%20Decision%20Ausgrid%20distribution%20determination%20-%20Attachment%206%20-%20Capital%20expenditure%20-%20April%202015.pdf>

Australian Energy Regulator, 2015, *FINAL DECISION Endeavour Energy distribution determination 2015-16 to 2018-19 Attachment 6 – Capital expenditure*, Table 6-2, accessed at <http://www.aer.gov.au/sites/default/files/AER%20-%20Final%20Decision%20Endeavour%20distribution%20determination%20-%20Attachment%206%20-%20Capital%20expenditure%20-%20April%202015.pdf>

TransGrid's New South Wales Transmission Annual Planning Report 2014⁴³ has acknowledged the significant contribution that energy efficiency measures have made in *"the decline in the energy consumed from the network and the moderation in growth rates of summer and winter maximum demands."* TransGrid has acknowledged the role that energy efficiency will play in the future by committing to build on its knowledge and understanding of energy efficiency and how it links to peak demand.

Similarly, Ausgrid's *Regulatory Proposal for 1 July 2014 to 30 June 2019*⁴⁴ reports that it has spent less than allowed by the Australian Energy Regulator on capital and infrastructure costs for the five years to 2013-14 with a significant under spend in the last two years. Ausgrid's *"analysis shows that a typical residential customer (5MWh pa) will benefit from electricity bills that are \$51 per annum lower than they otherwise would have been had we incurred all of the allowed capex"*.

Ausgrid's report indicates that this was in part due to energy efficiency measures as well as greater price sensitivity as a result of network prices and lower economic growth. Ausgrid's report also attributes lower growth in the 2014 to 2019 determination period due to *"impacts of ongoing solar PV penetration (...) the NSW Energy Savings Scheme and ongoing energy efficiency improvements."*

This evidence indicates that the ESS has contributed, in part, to the deferral of investment in electricity generation, transmission and distribution infrastructure.

The objective is still valid

There is evidence that the need to continue to reduce the cost of and the need for additional energy generation, transmission, and distribution infrastructure as:

- planning for infrastructure occurs over a long term period and is largely reliant on demand projections
- NSW power stations are aging and will need to be rehabilitated or replaced
- NSW transmission and distribution network service providers are planning investments that can be reduced or deferred with greater energy efficiency.

Infrastructure planning and aging power stations

New power station projects and major upgrades can take between five and seven years to plan and implement.⁴⁵ These projects are often informed by forecasts of future energy demand and so energy efficiency policy measures would need to be implemented well in advance of supply constraints if they are to defer investment.

<http://www.aer.gov.au/sites/default/files/AER%20-%20Final%20Decision%20Essential%20Energy%20distribution%20determination%20-%20Attachment%206%20-%20Capital%20expenditure%20-%20April%202015.pdf>

Australian Energy Regulator, 2015, *FINAL DECISION Essential Energy distribution determination 2015-16 to 2018-19 Attachment 6 – Capital expenditure*, Table 6-2, accessed at <http://www.aer.gov.au/sites/default/files/AER%20-%20Final%20Decision%20Essential%20Energy%20distribution%20determination%20-%20Attachment%206%20-%20Capital%20expenditure%20-%20April%202015.pdf>

Australian Energy Regulator, 2015, *FINAL DECISION TransGrid distribution determination 2015-16 to 2018-19 Attachment 6 – Capital expenditure*, Table 6-2, accessed at <http://www.aer.gov.au/sites/default/files/AER%20-%20Final%20Decision%20TransGrid%20transmission%20determination%20-%20Attachment%206%20-%20capital%20expenditure%20-%20April%202015%20fixed.pdf>

⁴² Institute of Sustainable Futures et al, 2010, *Building our savings: Reduced Infrastructure Costs from Improving Building Energy Efficiency*, prepared for the Commonwealth Department of Industry, accessed at <http://industry.gov.au/Energy/EnergyEfficiency/StrategiesInitiatives/NationalConstructionCode/Documents/buildingoursavings.pdf>

⁴³ TransGrid, 2014, *New South Wales Transmission Annual Planning Report 2014*, accessed at <http://www.transgrid.com.au/network/np/Documents/TransGrid%20Transmission%20Annual%20Planning%20Report%202014-web.pdf>

⁴⁴ Ausgrid, 2014, *Regulatory Proposal: 1 July 2014 to 30 June 2019*, accessed at http://www.ausgrid.com.au/~/_media/Files/Network/Planning%20for%20the%20future/Regulatory%20Reports/Ausgrids%20Regulatory%20Proposal.pdf

⁴⁵ Owen Inquiry, 2007, *Inquiry into Electricity Supply in NSW*, accessed at http://www.treasury.nsw.gov.au/data/assets/pdf_file/0011/13340/Owen_Inquiry_-_Main.pdf

A number of existing power stations in NSW are aging, indicating there may need to be investment to replace or upgrade generation capacity over the next decade or more. **Figure 7** shows the age of NSW generation capacity by capacity and generator type.

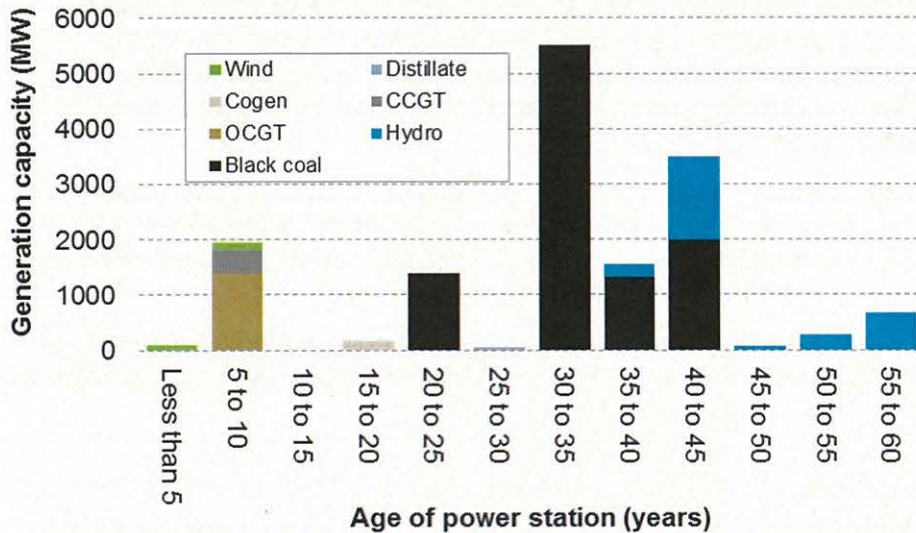


Figure 7 Age of current NSW centralised power generation capacity⁴⁶

Figure 8 shows the remaining economic life of existing NSW centralized power generation using industry standard figures for the economic life of new power stations. It shows that there is a significant amount of black coal capacity that may need to be refurbished or replaced within the next two decades.

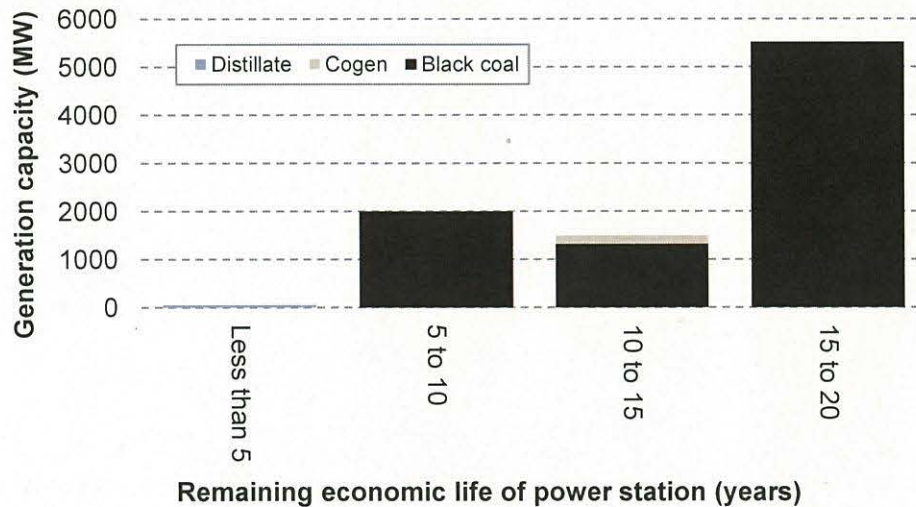


Figure 8 Remaining economic life of existing NSW centralized power generation capacity that may require replacement or refurbishment between 2015 and 2035⁴⁷

By placing downward pressure on future demand for energy, the ESS can help to reduce the amount of generation capacity that needs to be maintained to supply NSW's energy needs.

⁴⁶ Based on age of power stations published in: Australian Energy Market Operator, 2013, *National Transmission Network Development Plan: Existing Generator Information*, not including Munmorah, Wallerawang or Redbank power stations. Accessed at http://www.aemo.com.au/Electricity/Planning/Related-Information/~media/Files/Other/planning/esoo/2014/Generation_Information_NSW_2014_Dec_10.ashx

⁴⁷ Based on the Economic life assumptions used in ACIL Allen, 2014, *RET Review Modelling: Market Modelling of various RET policy options*, accessed at https://retreview.dpvc.gov.au/sites/default/files/files/ACIL_Report.pdf

Planned investments are already being reduced and can be further reduced

As discussed above, the Australian Energy Regulator has determined that NSW transmission and distribution networks service providers are to invest \$5.23 billion in 2014 dollars between 2014 and 2019 in electricity network upgrades that could potentially be deferred or reduced with lower demand. NSW transmission and distribution networks service providers incorporate energy efficiency in their demand reduction forecasts for energy consumption, including the ESS. This indicates that the ESS is currently informing network investment decision making and contributing to reduced investment in network infrastructure.

The Australian Energy Regulator has argued that *in this demand growth environment there is a stronger economic case for the use of demand management as investment in long-life network assets can be deferred until there is a more certain need, reducing the risk of stranded network assets. Further, the option value of demand management also increases.*⁴⁸

This indicates that although demand growth has slowed energy efficiency, including the ESS, is still able to assist network service providers defer investment in infrastructure and place downward pressure on consumer costs.

Outcome of consultations

Submissions that were received were generally in support of the findings of the Statutory Review and did not propose major changes to the analysis or further evidence that may be relevant.

Final finding

The Review finds that this objective has been met and remains valid. No legislative amendments are required

⁴⁸ Australian Energy Regulator, 2014, *Draft decision Endeavour Energy distribution determination 2015–16 to 2018–19 (Attachment 6: Capital expenditure)*, page 75, accessed at <http://www.aer.gov.au/sites/default/files/AER%20%E2%80%9320Draft%20decision%20Endeavour%20Energy%20distribution%20determination%20%E2%80%9320Attachment%206%20%E2%80%9320Capital%20expenditure%20%E2%80%9320November%202014.pdf>