



ACT
Government

Environment and Planning

Energy Efficiency Improvement Scheme: Setting Key Scheme Parameters to 2020

Regulatory Impact Assessment

May 2015

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Executive Summary

Background

The *Energy Efficiency (Cost of Living) Improvement Act 2012* (the Act) was passed by the Legislative Assembly on 3 May 2012. The Act provides for a retailer obligation energy efficiency scheme, referred to as the Energy Efficiency Improvement Scheme (EEIS), and establishes a Territory-wide Energy Savings Target (EST) which correlates to mandatory energy savings obligations for individual electricity retailers based on their electricity sales in the ACT. The Act currently provides for a scheme running initially until 31 December 2015.

The ACT Government's climate change strategy Action Plan 2 (AP2) released in September 2012 identified reducing energy use in existing homes as one of the most cost-effective ways for the ACT to achieve its emissions reduction targets and reduce the impact of rising electricity and gas prices over the long-term, and committed to extending the EEIS to 2020 as a key action, subject to further review.

An independent review of the EEIS was completed and tabled in the Legislative Assembly in September 2014¹. The review analysed activity undertaken to date and drew on extensive internal and external stakeholder consultation.

The outcomes of the review highlighted that there is advantage in continuing the EEIS as complementary to the Government's focus on reducing the GHG intensity of the electricity grid. Reducing energy consumption can reduce the costs associated with electricity use, and a 90 per cent renewable energy target.

Following further analysis, the ACT Government has agreed to draft legislation to continue the EEIS to 2020. This document outlines the costs and benefits associated with setting new targets and associated key scheme parameters for the period 2016 to 2020.

Consultation

A consultation paper, seeking stakeholder input on a wide range of key energy efficiency scheme parameters, was circulated to key stakeholders in 2014.

Retailers obligated under the EEIS, including both Tier 1 and Tier 2 retailers, as well as key community, industry and environment stakeholders were also actively engaged through a consultation paper and workshop and 10 written submissions were received.

Stakeholders generally supported the continuation of the EEIS to 2020 at a similar level of ambition – noting the importance of providing long-term certainty regarding retailer obligations. It was also suggested that the EEIS would benefit from greater third-party participation, allowing some trading of certificates, including business lighting measures, and clarifying the transition from Tier 2 to Tier 1 retailer status.

¹ http://www.environment.act.gov.au/__data/assets/pdf_file/0003/642315/ACT-EEIS-Review-Final-Report.pdf

Complementarity

In considering the continuation of the EEIS to 2020, the Government's broader objectives of achieving greater integration of programs and leveraging existing programs where feasible, have been considered. A review of existing schemes, policies and programs available to the residential and small to medium enterprise (SME) sectors indicates gaps remain in the ACT without the EEIS.

Opportunities for further alignment and harmonisation with similar schemes in other jurisdictions, was also a primary consideration – and recommended changes have been proposed to the EEIS to improve these outcomes.

Recommended continuation of the EEIS to 2020 – legislative changes

Based on the review of consultation and modelling results, amendments to the *Energy Efficiency (Cost of Living) Improvement Act 2012* have been drafted that would:

- a) Provide for annual compliance periods for each calendar year from 2016 to 2020 (inclusive);
- b) Increase the notice time given to retailers when increasing future compliance year targets;
- c) Allow the Administrator to register 'approved abatement providers' who are eligible to undertake EEIS activities in the ACT and create abatement that may be purchased by retailers to meet their energy saving targets. This will facilitate participation of Tier 2 retailers and increase competition in activity delivery – lowering costs for all electricity consumers and broadening the participant base;
- d) Allow the Administrator to recognise abatement created in the ACT under an 'approved interstate energy efficiency scheme';
- e) Provide that the Administrator may develop codes (by Disallowable Instrument) setting specific requirements for 'registered third-party providers' and for activities undertaken in the ACT and credited under a 'recognised other-jurisdictional scheme';
- f) Provide that existing requirements on retailers (or their contractors) undertaking activities under the EEIS be extended to 'registered third party providers' to ensure the effective operation of these parties;
- g) Enable the shortfall penalty rate (for a retailer not meeting their abatement target) to be set by disallowable instrument to provide the necessary flexibility and allow the EEIS to respond to implementation challenges should they emerge; and
- h) Clarify that a retailer transitions from being a Tier 2 to a Tier 1 retailer in the compliance period following the calendar year in which they exceeded the 5,000 customer and 500,000 MWh sales thresholds.

Overview of modelling

Detailed modelling was undertaken by Energetics Pty Ltd to determine the impact of continuing the EEIS to 2020. This modelling builds on existing modelling undertaken by Energetics to establish the original scheme and extend the EEIS to the non-residential sector. Further detail is provided in [Appendix B](#).

Emissions Factor

A significant change in the EEIS model inputs is the projected emissions associated with the consumption of electricity in the ACT (the 'emissions factor'). The emissions factors in the model have been updated to reflect the current projections for grid electricity in the ACT – a significant difference from the last version of the EEIS modelling is that these projections now account for the ACT's 90 per cent by 2020 renewable energy target².

The Emissions Factor for electricity was estimated to be 0.89 on average over the period 2013-2015 under the original modelling of the EEIS. The average Emissions Factor over the period 2016-2020 is now estimated at 0.4. The Emissions Factor for electricity is expected to stay stable at around 0.1 beyond 2020.

Subsequently this flows through to the assumed abatement values associated with activities undertaken under the EEIS, and this is reflected in the modelled abatement from activities over their lifetime. The overall targeted abatement ambition is therefore scaled to reflect the increasing difficulty, and cost, of achieving a tonne of abatement.

Modelling of the continuation of the EEIS to 2020 indicates that the EEIS will continue to deliver a positive Net Present Value at all levels of ambitions under a range of future price projection scenarios and discount rates. The increasing Net Present Value (NPV) and GHG emissions associated with an increasing *maximum* incentive per tonne of abatement is shown in ES 1.

Modelling results

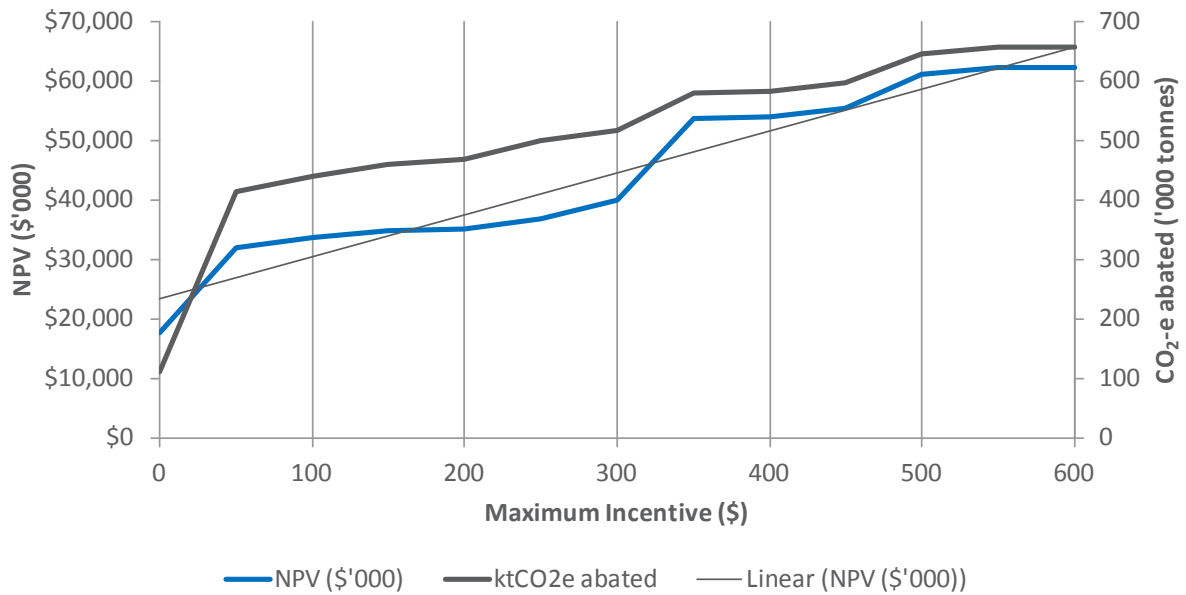
Modelling results indicate that continuing the scheme to 2020, at a comparable level of ambition, will have significant positive economic benefits at all levels of ambition and under a range of scenarios for future prices and other input assumptions.

The modelled Net Present Value and emissions saved at varying levels of ambition is shown in ES 1, below. Each vertical line in the graph represents the *maximum* cash incentive a retailer would pay for a tonne of abatement, and the resulting uptake of initiatives and associated abatement over a five year scheme.

In considering the results in ES 1, it is important to recognise the general trend of increasing NPV (the linear line), while GHG abatement levels off as the cost of the EEIS increases. It is also important to note that uncertainty remains regarding the precise point at which the NPV and/or GHG emission savings will significantly increase, and therefore the significant step-increase between \$300 and \$350 should not be interpreted as a precise point at which the NPV significantly increases.

² The emissions factors were developed by consultants pitt&sherry for the ACT Government and are consistent with the approach to calculate Scope 2 emissions factors for electricity purchased from a grid, as described in Chapter 7 of the Technical Guidelines for the estimation of greenhouse gas emissions by facilities in Australia, as specified for use in the National Greenhouse and Energy Reporting System, and are also consistent with the approach for calculating electricity generation emissions as described in the National Inventory Report. This approach aligns with the definitions used in The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard of the World Resources Institute/World Business Council for Sustainable Development (the GHG Protocol).

ES 1: NPV and GHG savings at varying incentive prices



In considering the appropriate level of ambition for the EEIS for the period 2016 – 2020, key considerations include the need to deliver the maximum benefit to the community, limit pass-through costs and achieve value-for-money while limiting risk and uncertainty. These factors and associated costs and benefits to the ACT economy and electricity consumers have been modelled under the range of target levels represented by the vertical lines in ES 1. Following an assessment of the impacts, it is recommended the Energy Savings Target be set at 8.6 per cent for the period 2016 to 2020. When combined with the decreasing emissions associated with saving electricity in the ACT in the future (as a result of the ACT’s 90 per cent renewable energy target), this represents a similar level of ambition to the EEIS in 2015 in terms of anticipated total scheme costs and projected electricity and gas savings.

Under base case assumptions, setting the EEIS Energy Savings Target at the preferred level of ambition of 8.6 per cent for the period is expected to result in a Net Present Value to the ACT economy of \$38.9 Million.

Under this scenario, overall energy savings of gas and electricity are similar to the level targeted in 2015, with slightly lower anticipated costs to retailers and pass through costs to consumers. Lifetime emissions saved as a result of the EEIS over the period 2016 to 2020 under this target are estimated at 515 ktCO₂-e. The reduction in projected lifetime savings compared to the period 2013 to 2015 reflects the falling emissions associated with saving electricity in the ACT, due to the 90 per cent Renewable Energy Target.

Changes in the Emissions Factor also result in a much greater incentive to implement activities that save natural gas. Electricity savings anticipated in 2020 as a result of implemented measures are 128,000 MWh, compared to 480,000 GJ of natural gas.

ES 2: Comparison of 2015 reference scenario and proposed 2016 - 2020 scenario

	Energy Savings Target	NPV (\$M/yr)	Lifetime CO ₂ -e (kT/ year)	Electricity Saved (MWh/yr)	Gas Saved (GJ/yr)	Average Bill Pass-through (\$/MWh)	Cost to Tier 1 Retailer (\$M/yr)	Tier 2 Energy Savings Contributions (\$M/yr)
<i>Reference Case (2015)</i> ¹	14.0%	\$14.00	296	353,210	929,553	\$4.90	\$10.9	\$4.4
Proposed 2015-2020	8.6%	\$8.00	103	280,249	1,162,517	\$3.95	\$8.2	\$3.8

1 The reference case represents the estimated values of the EEIS as operating in 2015

Summary of household costs and benefits

Modelling at the recommended target level demonstrates net-savings for households on average – noting that, as not all households will participate, actual household savings for participating households are expected to be higher – as has been observed in the first three years of the EEIS. It is important to note that while costs associated with the scheme will end with the end of the scheme, savings will continue to accrue for the lifetime of the implemented measures. Aggregate lifetime bill savings for the Residential sector are estimated at \$106 Million in present value terms.

ES 3: Summary of household costs and benefits

Average household price increase	Average bill Cost 2016 - 2020 (\$/week)	Average residential bill savings in 2020 (\$/Week)
2.32%	\$0.62	\$3.19

In addition, due to the design of the Scheme, which requires that a proportion of total Tier 1 retailer energy savings be achieved in priority households, a defined proportion of the benefits will continue to accrue in these households – in proportion with the Priority Household Target.

Summary of business costs and benefits

Estimated average costs to the non-residential sector are more difficult to determine due to the significant differences in energy use between different businesses. The impacts for various business electricity spends are outlined below. Total bill savings accruing in this sector over the lifetime of measures implemented under the EEIS are estimated at \$192 Million in present value terms.

ES 4: Summary of business costs

Annual business electricity spend of \$1,000	Annual business electricity spend of \$10,000	Annual business electricity spend of \$100,000	Annual business electricity spend of \$1,000,000
\$15	\$151	\$1,514	\$15,143

Background – Energy Efficiency in the ACT

The problem and its magnitude

The RIS undertaken to inform the development of the *Energy Efficiency (Cost of Living) Improvement Act 2012*, and the expansion of the EEIS to the non-residential sector (2013) established the clear and present need for regulatory intervention to achieve the Government's objective to improve the uptake of cost-effective energy efficiency measures for the benefit of ACT homes and businesses.

Key market failures identified as persisting in 2015, can be summarised as:

- Bounded rationality: while markets rely on individuals to make rational decisions, in practice, perfectly rational decisions are often not made as individuals and organisations have a limited ability to process and analyse information to make decisions that maximise their benefit.
- Discount rates: with regard to energy efficiency consumers, place a significantly greater emphasis on upfront purchase costs than on whole-of-life costs.
- Split incentive/ principal-agent problems: there is a well-documented misalignment of incentives and goals facing landlords, tenants and building managers, resulting in sub-optimal outcomes, principally for tenants.
- Public good information problems: many organisations lack an understanding of energy efficiency issues due to a range of information failures – including the time lag between consuming energy and receiving a bill.
- Early mover spill-overs: in most cases an industry or producer who moves to produce new energy efficient products early will bear the costs of developing and bringing the product to the market.

A survey of households participating in the EEIS supports this assessment – finding that most households would not have implemented energy efficiency activities without the EEIS, and that as a result of the EEIS they would consider undertaking further actions.

Reducing energy costs for consumers and greenhouse gas emissions

The shift from fossil fuel based generation to large-scale renewable energy generation is a major focus of AP2. Meeting the ACT's GHG targets in 2020 is expected to require the ACT to displace around 90 per cent of total electricity demand from the National Electricity Market (NEM) with emissions-free renewable energy – accounting for around 72 per cent of the potential emission reduction effort required to meet the ACT's 2020 GHG targets.

The ACT Government has made significant progress on achieving its legislated 90 per cent renewable energy target through initiatives such as the Solar and Wind Auctions, provided for by the *ACT Electricity Feed-in (Large-scale Renewable Energy) Act 2011*. However, the ACT, as part of a broader Australian economy and the NEM will continue to be dependent for some time to come on non-renewable fossil fuel sources from generators and producers in other states.

In recent years, national residential electricity prices have increased significantly. In the ACT between 2007-08 and 2012-13 the regulated (Transitional Franchise Tariff) household price of ACT electricity increased at an average compound rate of 7 per cent per year³. This is largely due to the

³ Average compound growth between 2007-08 TFT rate of \$13.76/kWh and 2012-13 TFT rate of \$19.32/kWh.

significant network investment over this period. While the household cost of electricity has declined in the past year, this downward trend is broadly considered to be unsustainable (with wholesale prices being close to or below the long run cost of many generators, and carbon costs remaining a significant market externality).

There has recently been significant speculation regarding future wholesale gas prices due to increased trade exposure, with Australia's gas market historically isolated from the rest of the world and international gas prices.

While gas prices are not regulated in the ACT, they typically align with NSW regulated prices and any increases immediately flow through to the ACT, as it forms part of the bigger NSW gas market and networks. In June 2014, the independent NSW regulator (IPART) released a gas price decision, providing for an 18% increase in retail gas prices from 1 July 2014 – reflecting the significantly higher pricing in the international markets. Notwithstanding the recent drop in international oil prices, increasing gas prices are part of an overall trend of higher fossil fuel pricing due to growing demand in emerging markets such as China and India.

AP2 recognises the importance of energy efficiency as the most effective way for the Territory to address higher energy costs and reduce greenhouse gas emissions. The residential and non-residential sectors (including business and government) have the potential to reduce annual emissions by implementing cost-effective upgrades to existing buildings and increasing the efficiency of new buildings.

The need to move to a low carbon economy and renewable energy sources will have an impact on energy prices. These costs are primarily manifest in scheme costs passed through to energy users, such as the Commonwealth's Renewable Energy Target Scheme and the ACT's feed-in tariffs.

Reducing electricity and gas imports will also reduce the cost burden of achieving the Territory's emission reduction targets by reducing requirements to offset electricity emissions with investments in renewable energy.

Investment decisions made today will impact household and business energy use into a future where prices may be significantly higher. Investing in cost-effective energy efficiency therefore provides an effective buffer against uncertain future prices.

Review of options and existing programs

International studies show that despite ongoing improvements in energy efficiency, there remains great potential for additional cost-effective energy savings across all sectors of the economy.

While a range of policy options exist to stimulate the uptake of cost-effective energy efficiency measures, it is generally accepted that due to the range of barriers that exist to energy efficiency, no single measure is sufficient. The measures most relevant to households and SMEs in the ACT are discussed below

Education and information campaigns

Government funded information campaigns may be used to inform consumers about the consequence of energy consumption and the benefits of energy efficiency. These campaigns typically focus on simple, easy to implement changes or generic advice.

Examples of ACT Government initiatives in this area include:

- information campaigns
- energy labelling
- energy bill benchmarking

Information campaigns

Existing information campaigns in the ACT include:

- Home Energy Advice Service: provides free, independent advice, information and resources over the phone or online to help householders improve their energy efficiency. A range of workshops are also held throughout the year, and there is a user pays option for an in-home energy efficiency assessment.
- The online Actsmart sustainability portal which includes fact sheets, tips and tools to help people reduce energy use.
- Home Energy Action Kit: available through ACT Public Libraries, the kit enables households to perform an energy audit and develop their own Home Energy Action Plan.

While information campaigns may help to inform consumers about energy efficiency, alone they are not effective in changing behaviour. This is due to the transaction costs associated with assessing and implementing changes and the fact that consumers are 'time poor'. Further, they often require additional actions to make the advice relevant to specific situations, with programs becoming more costly when they are required to reach more people with more specific information.

These schemes are therefore most appropriately considered as complementary to other policies which address market failures in a more comprehensive manner.

Energy labelling

Consumers may alter their purchasing behaviour when given information about the relative performance efficiency of products. In the case of appliances, under the national Greenhouse and Energy minimum Standards Act 2012 air conditioners, clothes dryers, clothes washers, computer

monitors, dishwashers, freezers, refrigerators and televisions in the ACT must carry an Energy Rating Label (ERL). Labelling is usually related directly to minimum performance standards. ERLs allow comparison between similar appliance models through a star rating of between one and ten stars (the greater the number of stars, the higher the efficiency) and the annual energy consumption.

In addition to appliance labelling, since 1999 sellers of residential properties in the ACT have had to provide information about their property's Energy Efficiency Rating (EER). The EER is a 0 to 10 star rating of the thermal performance of the building shell.

While such labelling requirements may improve the quality of information a consumer has to make a decision regarding the purchase of an appliance or home, some buyers and tenants may be unable to use the information to achieve a saving for a number of reasons, including:

- their preferences are such that they have minimal choice in the market;
- low vacancy rates in the market dictate that tenants and buyers have few options and are not in a position to compare a set of properties on the basis of energy efficiency;
- poor understanding of how an EER of a home is calculated and what aspects of the home are not included (such as heating systems or fixed appliances);
- the potential energy efficiency savings are not sufficient to overcome other characteristics (i.e. location, amenities, functionality, size, appearance, upfront or ongoing price, availability); and
- decision-makers within organisations do not place a high value on energy savings and therefore do not use that as a factor in their choice⁴.

Further, energy labelling has a limited scope to overcome the outlined market failures as, ultimately, energy labelling information does not motivate consumers not already in the market to replace or refurbish inefficient appliances or homes.

Energy bill benchmarking

ACT electricity retailers are required to show on their energy bills how a household's electricity consumption compares to other households in the ACT. In addition, gas consumption trends over time must be displayed.

While benchmarks enable residential customers to compare their daily use against others, thus partially addressing information gaps, this information does not address identified barriers such as bounded rationality, split incentives or other information failures – as further information will be required by households to inform them of available opportunities to improve energy efficiency.

Energy performance standards

Energy performance standards set minimum levels of energy efficiency required for products. There are two forms of standards that are relevant for households and SMEs in the ACT:

- *Appliances and equipment* – these are regulated through a national program, Minimum Energy Performance Standards (MEPS), coordinated by jurisdictional governments under the

⁴ Department of the Environment, Water, Heritage and the Arts, (2008) *Consultation RIS for the Mandatory Disclosure of Commercial Office Building Energy Efficiency*, p42

National Framework on Energy Efficiency. These address specific types of major energy-using devices in the residential, commercial and industrial sector. This program expands to include new appliances over time as deemed necessary.

- *Building standards* – under the Building Code of Australia 2010 new residential buildings in the ACT are required to meet minimum energy performance standards (often taken as a 6 star energy rating under the Nationwide House Energy Rating Scheme).

Minimum standards have been found to be among the most cost-effective ways of reducing energy usage and associated emissions. However, a number of significant limitations to such policies exist, including:

- Lag time – a significant amount of time is required to develop standards due to the consultation and engineering analysis required.
- They are prescriptive – consumers are not able to determine for themselves whether avoided energy costs warrant the potentially significant up-front costs, or loss of other amenity.
- Information availability – there appears to have been a consistent conservative bias in past RISs developed for MEPS, with the cost-effectiveness of regulatory action significantly higher than originally projected due to unforeseeable changes in the population⁵.
- Only the worst performers are eliminated – in terms of what is commercially available at the time they are enacted.
- They do not change behaviour – standards can reduce energy consumption for a given device while in use, however, they cannot reduce their usage. For example, people now own more, larger televisions, used for more hours and ownership of other small electrical equipment has proliferated.
- They apply only to new purchases – standards cannot encourage owners of existing, operational equipment or buildings to retire or modify their assets to enhance energy performance – leading to a significant time lag in the transformation of existing stock towards better energy performance.

Rebates and subsidies

A number of rebates for energy efficiency improvements exist in the ACT:

- Actsmart Business Energy and Water Program: provides an energy and water assessment for small businesses and 50 per cent of costs of upgrades (up to \$5,000).
- Outreach Energy and Water Efficiency Program: assists low-income households in the ACT to reduce their energy and water bills. The focus of the program is on providing personalised education to support those most in need through a home energy assessment, the provision of energy efficiency appliances, retrofits, advice and energy saving kits.

Rebates allow governments to overcome a range of market failures in the uptake of more energy efficient products by providing an incentive to purchase energy efficient products. That is, rebates offset the purchase cost and lower the associated pay-back period for eligible products.

⁵ <http://www.energyrating.gov.au/library/pubs/201110-retro-review-e3-program.pdf>

Rebate programs can be effective ways to increase the uptake of specific energy efficient products and to target specific groups such as low income households and businesses, however they are often costly to administer and take-up rates can vary. A 2011 Grattan Institute report⁶ that analysed the range of policies implemented in Australia to reduce emissions, found rebates to be highly cost-ineffective compared to other options, especially those delivered by the private sector.

A number of other inherent problems exist with rebates. These include the difficulty in setting a sustainable price, sudden policy changes and poor installations that reduce effectiveness.

Subsidised Government programs can ensure equity to low-income households that might not be able to afford market based initiatives. Rebates are therefore most appropriately considered as complementary to other policies which address market failures in a more comprehensive manner.

Market-based initiatives

Market mechanisms lessen the extent to which governments must prescribe a certain response – allowing businesses to be innovative to deliver a prescribed outcome at the lowest cost. Further, market mechanisms return rewards or penalties based on the *delivery* of emissions/energy savings, as opposed to tendering or information campaigns that may not deliver on estimated savings despite significant government expenditure.

As a result, markets routinely find cheaper ways to meet abatement targets than is forecast by policymakers. This is demonstrated by sulphur dioxide and nitrogen oxide markets in the US through the 1990s, the ACT and NSW Greenhouse Gas Abatement Scheme, the national Renewable Energy Target scheme and carbon emissions trading schemes in Europe. This conclusion is made by the recent Grattan Institute Report, which found that of all approaches analysed, market mechanisms have delivered the greatest emissions reductions and have generally met targets ahead of time in Australia.

Successful market-based retailer energy efficiency obligation schemes continue to be implemented in Victoria, NSW and South Australia, as summarised below.

Victorian Energy Efficiency Target Scheme (VEET)

The VEET scheme commenced in January 2009 and is legislated to continue in three-year phases until 1 January 2030. The scheme is certificate based with energy savings measures being delivered by third party providers to the residential and non-residential sectors – covering both electricity and gas. For the first three-year phase of the scheme (2009-11), the scheme target was 2.7 million certificates (tonnes CO₂-e) per annum. This increased to 5.4 million certificates per annum starting on 1 January 2012.⁷ The shortfall penalty rate for the 2014 compliance year is subject to a CPI calculation and is \$44.54 per certificate. The new Victorian Government has committed to continuing the VEET scheme and is currently reviewing the scheme and future targets.

⁶ Daley, J., Edis, T. And Reichl, J, 2011, Learning the hard way: Australian policies to reduce carbon emissions, Grattan Institute, Melbourne

⁷ <https://www.veet.vic.gov.au/public/Public.aspx?id=Overview>

NSW Energy Savings Scheme (ESS)

The ESS commenced in July 2009 and is legislated to continue to 2020. The scheme is certificate-based with the majority of energy savings services being delivered by third party providers. It applies to electricity suppliers and large wholesale purchasers of electricity and only covers electricity savings. Energy savings measures can be delivered in the residential, commercial and industrial sectors.⁸ The NSW Government intends to enhance the ESS in the future by expanding the scheme to include gas and extending the scheme to 2025.⁹ From 2014 to 2020 the target is set at 4 per cent of annual NSW electricity sales. The Scheme Penalty Rate for 2015 is \$26.54 per certificate.

South Australian Retailer Energy Efficiency Scheme (REES)

The REES commenced in January 2009, and will continue until December 2020. Under REES, a non-certificate based scheme similar to the EEIS, retailers must deliver energy savings measures in households and businesses. Energy efficiency audits must also be delivered in low-income households. The overall target for 2015 is 1,200,000 GJ, while 230,769 GJ (19 per cent) of savings must be achieved in low-income households¹⁰.

While national support has decreased in recent years, a number of national schemes remain that may support energy efficiency, outlined below.

Commonwealth Emissions Reduction Fund

The Commonwealth Government is currently undertaking work to implement the Emissions Reduction Fund (ERF) to help achieve Australia's 2020 emissions reduction target of five per cent below 2000 levels by 2020. The Government has committed \$2.55 billion to be awarded to projects through an auction mechanism, to be administered by the Clean Energy Regulator. While not all eligible methodologies have not been finalised, it is anticipated the ERF will focus on industrial and commercial upgrades – as these will be the lowest-cost activities able to return substantial abatement under one bid. The ERF has also been subject to significant industry criticism regarding its ability to effectively deliver the broad-scale changes and level of abatement required within its limited budget.

In particular, due to the staging of payments over a number of years (rather than providing an upfront incentive), energy efficiency activities that may have a high upfront cost (even with a short payback period) are not expected to be incentivised under the ERF¹¹.

⁸ http://www.ess.nsw.gov.au/How_the_scheme_works

⁹ http://www.resourcesandenergy.nsw.gov.au/__data/assets/pdf_file/0003/534630/Review-of-the-Energy-Savings-Scheme-Information-Paper-.pdf

¹⁰ <http://www.escosa.sa.gov.au/residential-energy-efficiency-scheme-rees/rees-targets.aspx>

¹¹ http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Submissions

Preferred Option: An ACT retailer-obligation energy savings scheme

Considering the range of market failures and options available, continuing the market-based EEIS represents the most likely option to achieve broad-based energy efficiency improvements in households and SMEs at the lowest cost. The EEIS has demonstrated its ability to incentivise retailers, through the creation of targets and abatement value created by energy efficiency activities, to seek out and overcome the barriers for consumers to install energy efficient products – such as lack of time, lack of information and structural barriers such as split incentives. The scheme is overcoming the identified market failures in a number of ways, as described below.

Bounded rationality and organisational failures

Retailers will have greater incentive under the scheme to seek emissions reductions where it is most cost effective to do so. In this regard, the problem of high discount rates and the bounded rationality of consumers is overcome by retailers offering inducements for the purchase and installation of energy efficient products.

Discount rates

As retailers provide upfront ‘cash’ incentives and information to consumers regarding opportunities and likely savings, consumers are less likely to place a greater emphasis on upfront purchase costs than whole-of-life costs. They are also well placed to offer repayment options, through energy billing systems, where repayments can be offset by future cost savings.

Split incentive/Principal-agent problems

20 per cent of households participating in the EEIS to-date have been renters. Further, as retailers move to install more expensive measures, retailers may seek negotiations with landlords, bodies corporate or building managers to implement abatement activities where cost effective – with landlords benefiting from capital improvements and tenants benefiting from reduced energy costs and increased amenity. In addition, retailers are known to be considering offers to finance initiatives up-front and seek repayment of costs over time, including through energy bills over the term of a lease.

Public good information, information spill-overs and information asymmetry

The EEIS addresses information failures, as it is in the retailer’s interest to provide information around activities they wish to undertake on behalf of consumers in a way that achieves maximum uptake of energy efficiency measures, rather than providing information for its own sake.

Early mover spill-overs

A greater interest in energy efficient products by both retailers and consumers may further lead to early movers benefiting from early gains in the form of brand reputation, product recognition and early leads in market share. These benefits may provide sufficient incentives for early movers to bear the up-front costs where the remaining spill-overs are relatively small.

The Energy Efficiency Improvement Scheme

Given the large and immediate opportunity for cost-effective energy efficiency in the ACT to achieve the GHG reductions required, the ACT Government has acted to implement a retailer obligation energy efficiency scheme.

The *Energy Efficiency (Cost of Living) Improvement Act 2012* was passed by the Legislative Assembly on 3 May 2012. The Act provides for a retailer obligation energy efficiency scheme – the Energy Efficiency Improvement Scheme (EEIS) – commencing from 1 January 2013, running initially until 31 December 2015.

The objects of this Act are to:

- a) encourage the efficient use of energy; and
- b) reduce greenhouse gas emissions associated with stationary energy use in the Territory; and
- c) reduce household and business energy use and costs; and
- d) increase opportunities for priority households to reduce energy use and costs.

The Act establishes a Territory-wide Energy Savings Target (EST) which correlates to mandatory energy savings obligations for individual electricity retailers based on their electricity sales in the ACT. The EST is set by the Minister for the Environment by Disallowable Instrument. Lifetime savings of measures are deemed upfront and given in the year that they are undertaken, meaning that the targeted savings actually occur over a longer time period.

Retailer obligations

The individual retailer obligation is represented in tonnes of CO₂-e, calculated by the following formula:

$$\text{Obligation (tonnes CO}_2\text{-e)} = \text{Energy Savings Target (\%)} \times \text{Emissions Multiplier} \times \text{Retailer Sales (MWh)}$$

The emissions factor is also a Disallowable Instrument made by the Minister and has been set at 0.89 for 2013 to 2015.

The way in which a retailer must meet this target is determined by their electricity sales as well as the number of customers they have. Retailers are defined as being either Tier 1 or Tier 2.

Tier 1 Retailer:

- Electricity sales of 500,000MWh or greater to customers in the ACT in a compliance year; and
- Greater than 5, 000 customers in the ACT.

Tier 2 Retailer:

- All other retailers.

In order to meet their energy savings obligation, Tier 1 retailers must undertake eligible energy saving activities approved under the Act. Tier 1 retailers are also obliged to achieve a proportion of their energy savings obligation in low-income households, as determined by the Minister by Disallowable Instrument.

Tier 2 retailers may choose to undertake eligible energy saving activities or they may pay a contribution fee set at the expected average cost of abatement for a Tier 1 retailer. The contribution is set by the Minister by Disallowable Instrument, based on the estimated *average cost of compliance* for a Tier 1 retailer. This provides a simplified obligation for smaller retailers who may not have the customer base or resources in the ACT to fully participate in the Scheme, and who may be discouraged from participating in the ACT market if required to undertake activities. This equalises the cost of participation for all retailers and, in turn, mitigates potential adverse effects of the Scheme on competition in our retail electricity market.

In order to ensure reasonable incentives exist for Tier 1 suppliers to undertake abatement activities, the penalty for not achieving the abatement target is set slightly higher than the expected *maximum* price a retailer will pay per tonne of abatement.

Eligible activities

A Notifiable Instrument, providing for an initial list of activities which retailers may undertake to meet their obligation under the EEIS is made by the Minister.

The EEIS has been developed specifically to align closely with other energy efficiency schemes in Australia. While the ACT non-certificate market based scheme, due to the small size of the ACT economy, activity and eligible product requirements align with those of other jurisdictions where possible. This simplifies retailer participation, with many retailers in the ACT also operating in other jurisdictions.

Options for extending the EEIS beyond 2015

Objective

An independent review of the EEIS was completed and tabled in the Legislative Assembly in September 2014. The review analysed activity undertaken to date and drew on extensive internal and external stakeholder consultation.

The outcomes of the review highlighted that there is advantage in continuing the EEIS as complementary to the Government's focus on reducing the GHG intensity of the electricity grid. Reducing energy consumption can reduce the costs associated with electricity use, and a 90 per cent renewable energy target.

The review also highlighted that obligated electricity retailers require longer term certainty (beyond the current legislated three year periods) regarding the future of the Scheme to enable the implementation of a sustainable and effective business model. Retailers also require greater responsiveness from the Administrator of the Scheme with regard to bringing in new innovative activities that can deliver cost-effective energy savings.

Building on the work of the Review, EPD has undertaken further extensive stakeholder consultation, analysis and modelling to inform options for the extension of the EEIS beyond 2015. Retailers obligated under the EEIS, including both Tier 1 and Tier 2 retailers, as well as key community, industry and environment stakeholders were actively engaged through a consultation paper and workshop. Ten written submissions were received.

A summary of the issues identified in stakeholder submissions and discussions, and the consideration of these issues as directly influencing the proposed design for the EEIS beyond 2015, is provided at [Appendix A](#).

Legislative changes required

Based on the review and consultation, amendments to the *Energy Efficiency (Cost of Living) Improvement Act 2012* have been drafted that would:

- a) Provide for annual compliance periods for each calendar year from 2016 to 2020 (inclusive);
- b) Increase the notice time given to retailers when increasing future compliance year targets;
- c) Allow the Administrator to register third-party providers who are eligible to undertake EEIS activities in the ACT and create abatement that may be purchased by retailers to meet their energy saving targets. This will facilitate participation of Tier 2 retailers and increase competition in activity delivery – lowering costs for all electricity consumers and broadening the participant base;
- d) Allow the Administrator to recognise abatement created in the ACT under recognised activities in 'other-jurisdictional schemes';
- e) Provide that the Administrator may develop codes (by Disallowable Instrument) setting specific requirements for 'registered third-party providers' and for activities undertaken in the ACT and credited under a 'recognised other-jurisdictional scheme';

- f) Provide that existing requirements on retailers (or their contractors) undertaking activities under the EEIS be extended to 'registered third party providers' to ensure the effective operation of these parties;
- g) Enable the shortfall penalty rate (for a retailer not meeting their abatement target) to be set by disallowable instrument to provide the necessary flexibility and allow the EEIS to respond to implementation challenges should they emerge; and
- h) Clarify that a retailer transitions from being a Tier 2 to a Tier 1 retailer in the compliance period following the calendar year in which they exceeded the 5,000 customer and 500,000 MWh sales thresholds.

Overview of options and impacts – continuing the EEIS to 2020

Scheme metric

For the period 2013-2015 the EEIS metric was framed in terms of carbon dioxide equivalent (CO₂-e) savings – with the retailer obligation targets set in relation to GHG savings. Consequently, activities are also measured in terms of their CO₂-e savings. However rather than being justified on the basis of CO₂-e savings, the Scheme has been designed to stimulate energy efficiency activities that achieve an optimal balance of costs and financial benefits for participants and the community as a whole. This justification is set out in the Scheme Targets and Impacts section of the original Regulatory Impact Statement underpinning the development of the EEIS.

Given the ACT Government's 90% renewable energy target, it was identified that the existing CO₂-e metric becomes less meaningful as the portion of the ACT's energy provided by renewable sources grows. However, the EEIS was identified as still having a critical role to play in reducing energy use and costs, as it is likely to enable the ACT Government to achieve its 90 per cent renewable energy target sooner and with less cost, as well achieve cost savings for customers over the long run.

The use of a range of metrics (including CO₂-e, NPV and energy savings) were therefore considered for the continuation of the EEIS beyond 2015.

Stakeholders noted that the current CO₂-e metric is well understood across schemes and maintaining the metric would provide participants with continuity and certainty. Some stakeholders noted changing to a non-energy or CO₂-e metric could create unnecessary confusion and would require some changes to retailer's systems. Stakeholders noted the EEIS should focus on alignment with other schemes and ensure the outcomes sought by the EEIS are clear. The EEIS should seek to minimise the number of assumptions required to determine the key parameters of the scheme, noting the importance of the metric is in some ways impacted by the length of the scheme and the anticipated lifetime of energy savings associated with the activities undertaken.

A detailed discussion of the technical issues in relation to selecting a metric is provided in [Appendix C](#).

In order to meet these objectives, reduce changes and decrease the assumptions underpinning the scheme, it was determined appropriate that the CO₂-e metric be maintained, but that the emissions factors be updated to reflect the 90 per cent renewable energy target – with retailer targets, associated scheme parameters (such as penalties and contributions) and abatement values associated with eligible activities scaled accordingly.

Priority Household Target

Tier 1 retailers are obliged to achieve a proportion of their energy savings obligation in low-income households, as determined by the Minister by Disallowable Instrument. The Priority Household Target (PHT) was set at 25 per cent each year from 2013 to 2015. This was set just above the estimated 20 per cent of households receiving energy concessions and/or holding a concession card in the ACT. In reality, however, 30 per cent of participating households to-date have been priority households – showing the target incentivises retailers to overshoot the target to ensure the target is met and avoid any penalties associated with not meeting the target.

Through the consultation process, a number of stakeholders noted that low-income households benefit the most from energy efficiency, but are least able to make improvements without additional assistance. Stakeholders also identified that a large number of low income households had already participated in the scheme, therefore the PHT should not be so onerous that it increases costs and risks to the EEIS.

Although ensuring energy savings are achieved in low income households remains a Government priority, it is recommended the PHT be decreased in 2016 to 20 per cent. This would have the effect of balancing costs to consumers, while ensuring priority households in the ACT continue to benefit from the EEIS - noting the incentive to overshoot the target also remains.

For the purposes of modelling, all household costs and savings assume a 20 per cent priority household target for the period 2016 to 2020, however, the target will continue to be subject to annual review.

Background to scheme impact modelling

Modelling was undertaken by consultants Energetics to determine the potential energy saving opportunities available and the costs and benefits to the ACT economy, households and businesses as a result of extending the EEIS to 2020. Importantly, this analysis also informs the setting of new targets and associated parameters which set the ambition of the EEIS beyond 2015.

In summary, the model developed by Energetics uses a range of inputs, calculates the uptake and resulting energy savings at a maximum incentive price and from this the economic benefits to the economy as a whole and energy consumers.

An overview of the model and key inputs and outputs, and the method for calculating activity take-up, is provided in [Appendix B](#), with key aspects discussed below.

Energy and scheme costs

Energy cost savings calculations in the Scheme modelling do not assume any reduction or increase in distribution network charges across the economy resulting from the Scheme. This reflects that distribution network charges generally recover fixed capital costs that may not reduce as a result of reduced energy consumption within short to medium-term timeframes. It is acknowledged that any material reduction in total ACT electricity or gas consumption would result in a proportional reduction in revenue to ActewAGL Distribution. Any benefits associated with deferred capital investment resulting from the scheme are additional to those modelled.

Estimated consumer bill savings, however, assume that the household or business saves on the full retail price of electricity – as they will see a reduced energy bill corresponding with lower consumption.

In relation to the calculation of costs and benefits accruing to the ACT economy as a whole (i.e. the calculation of the Net Present Value), the modelling conservatively assumed 10 per cent of costs associated with implementing the scheme are recycled within the ACT economy – acknowledging stakeholder feedback regarding staffing of the retailer and their contractors.

Emissions factors and activity abatement values

A significant change in the EEIS model inputs is the projected emissions associated with the consumption of electricity in the ACT (the ‘emissions factor’). The emissions factors in the model have been updated to reflect the current projections for grid electricity in the ACT – a significant difference from the last version of the EEIS modelling is that these projections now account for the ACT’s 90 per cent by 2020 renewable energy target¹².

The Emissions Factor for electricity was estimated to be 0.89 on average over the period 2013-2015 under the original modelling of the EEIS. The average Emissions Factor over the period 2016-2020 is now estimated at 0.4. The Emissions Factor for electricity is expected to stay stable at around 0.1 beyond 2020. Subsequently this flows through to the assumed abatement values associated with activities undertaken under the EEIS, and this is reflected in the modelled abatement from activities over their lifetime.

Modelled economic costs and benefits

Modelling of the continuation of the EEIS to 2020 indicates that the EEIS will continue to deliver a positive Net Present Value (NPV) to the ACT economy at all levels of ambitions under a range of future price projection scenarios and discount rates.

The modelled NPV and emissions saved at varying levels of ambition is shown in Figure 1 below. Each vertical line in the graph represents the *maximum* cash incentive a retailer would pay for a tonne of abatement, and the resulting uptake of initiatives and associated abatement over a five year scheme.

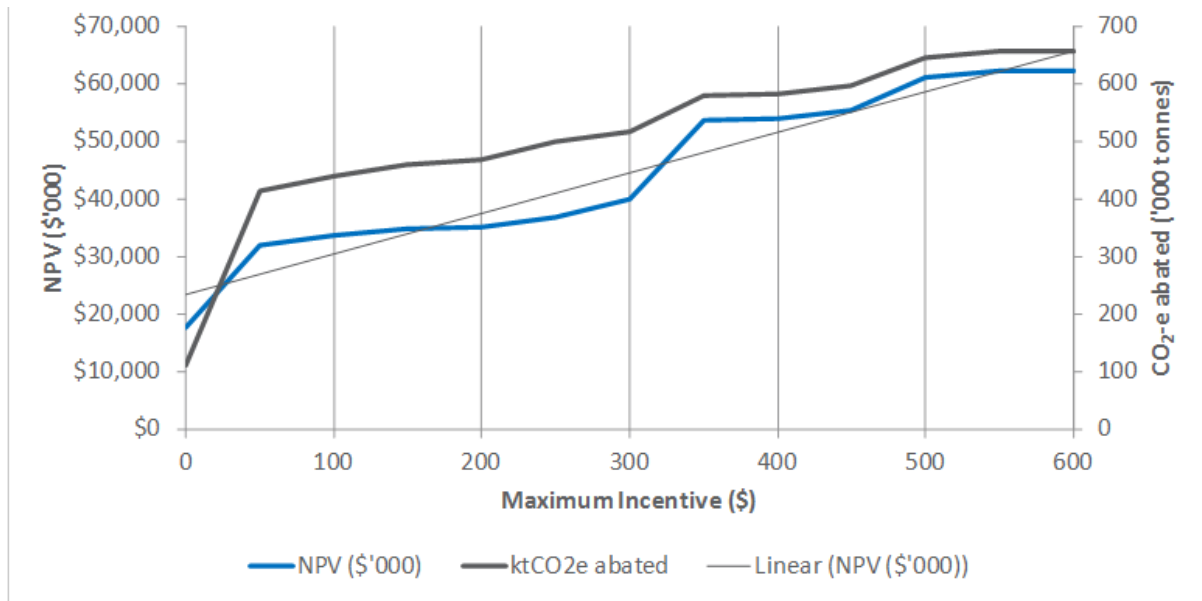
As the level of ambition of the scheme increases (represented by the *maximum* incentive a retailer would pay for 1 tonne of abatement under the EEIS, but not the average), the NPV and CO₂-e abated increases, but not at a linear rate. This reflects the staggered uptake of activities at different price points. In addition, the levelling-off of abatement achieved, compared to increases in the NPV at a

¹² The emissions factors were developed by consultants pitt&sherry for the ACT Government and are consistent with the approach to calculate Scope 2 emissions factors for electricity purchased from a grid, as described in Chapter 7 of the Technical Guidelines for the estimation of greenhouse gas emissions by facilities in Australia, as specified for use in the National Greenhouse and Energy Reporting System, and are also consistent with the approach for calculating electricity generation emissions as described in the National Inventory Report. This approach aligns with the definitions used in The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard of the World Resources Institute/World Business Council for Sustainable Development (the GHG Protocol).

\$300/tonne maximum incentive price, reflects that at this point only additional activities that save electricity (and not natural gas) are taken up – which has a much lower emissions savings in the future in the ACT, but reflects significant economic benefit.

It is important to note that uncertainty remains regarding the precise point at which the NPV and/or GHG emission savings will significantly increase, and therefore the significant step-increase between \$300 and \$350/tonne maximum incentive should not be interpreted as a precise point at which the NPV significantly increases.

Figure 1: Summary of NPV and GHG savings at varying incentive price points



Selection of preferred scenario

In considering the appropriate level of ambition for the EEIS for the period 2016 – 2020 the following factors must be considered:

- Delivering the maximum benefit to the community – Significant net economic benefits are associated with pursuing a high level of ambition under an extended scheme.
- Limiting pass-through costs – Benefits associated with the scheme are achieved only by participating households and businesses, while costs are passed through to all electricity consumers. Equity issues may therefore increase as the scheme becomes more ambitious.
- Achieving value for money – As the scheme becomes more ambitious, there is generally diminishing returns for money invested through the scheme as less cost effective measures are required to meet scheme targets.
- Limiting risks - As the scheme becomes more ambitious, costs become more uncertain, industry delivery capability is tested and normal occupational health and safety risks associated with undertaking works in residential and commercial premises are amplified.

Following a detailed comparison of the associated costs and benefits to the ACT economy and electricity consumers under a range of targets, it is recommended the Energy Savings Target be set at the ‘maximum incentive price’ of \$300/t. This corresponds to an 8.6 per cent target for the period 2016 to 2020. When combined with the decreasing emissions associated with saving electricity in

the ACT in the future (as a result of the ACT’s 90 per cent renewable energy target), this represents a similar level of ambition to the EEIS in 2015 in terms of anticipated total scheme costs and projected electricity and gas savings. This is consistent with stakeholder feedback to continue the scheme at current levels, as outlined at Appendix A.

Under base case assumptions, setting the EEIS Energy Savings Target at the preferred level of ambition of 8.6 per cent for the period is expected to result in a NPV to the ACT economy of \$38.9 Million. Lifetime emissions saved as a result of the EEIS over the period 2016 to 2020 under this target are estimated at 515 ktCO₂-e. The reduction in projected lifetime savings compared to the period 2013 to 2015 reflects the falling emissions associated with saving electricity in the ACT, with the whole scheme scaled accordingly.

Noting the sharp increase in NPV and GHG emissions also corresponds to a modelled sharp increase in costs to retailers and consumers, it is considered prudent to set the target at this level to ensure pass-through costs to consumers are minimised, while ensuring ambition is maximised, under some uncertainty. The targets, and scheme costs and benefits, will also be subject to ongoing evaluation for their appropriateness into the future.

Changes in the Emissions Factor also result in a much greater incentive to implement activities that save natural gas. As shown in Table 1, gas savings become proportionally much more dominant in the EEIS as modelled beyond 2015. Electricity savings anticipated in 2020 as a result of implemented measures are 128,000 MWh, compared to 480,000 GJ of natural gas.

A comparison of the energy savings and costs between the current ‘base case’ (i.e. assuming the EEIS were to continue under the 2015 parameters), compared to the proposed 8.6 per cent target, is provided below in Table 1.

Table 1: Summary of Scheme impacts compared to reference case

	Energy Savings Target	NPV (\$M/yr)	Lifetime CO ₂ -e (kT/ year)	Electricity Saved (MWh/yr)	Gas Saved (GJ/yr)	Average Bill Pass-through (\$/MWh)	Cost to Tier 1 Retailer (\$M/yr)	Tier 2 Energy Savings Contributions (\$M/yr)
<i>Reference Case (2015)</i> ¹	14.0%	\$14.00	296	353,210	929,553	\$4.90	\$10.9	\$4.4
Proposed 2015-2020	8.6%	\$8.00	103	280,249	1,162,517	\$3.95	\$8.2	\$3.8

1 The reference case represents the estimated values of the EEIS as operating in 2015

Sensitivity analysis – Net Present Value

All modelling is inherently sensitive to changes in the key input parameters and assumptions. In particular projected future energy prices, the assumed recycling rate of costs within the ACT economy and the economic discount rate used to calculate Net Present Value (NPV) have an impact on the modelled outcomes.

The results of this analysis indicate that, while the modelling is sensitive to changes in key input parameters and assumptions, in no instance do the net benefits of the Scheme become negative, as summarised below in Table 2.

Table 2: Summary of sensitivity analysis

Scenario	NPV ('000)
<i>Base Case</i>	\$39,841
0% Economic Recycling Rate	\$30,187
25% Economic Recycling Rate	\$54,323
'Real 20% RET by 2020' Price Scenario	\$44,859
30% RET by 2020' Price Scenario	\$40,648
3% Nominal Discount Rate	\$76,837
10% Nominal Discount Rate	\$20,773

Sensitivity analysis – GHG savings achieved

The changing market share of the single Tier 1 retailer in the ACT, ActewAGL Retail, also has implications for the amount of abatement achieved in the ACT as a direct result of retailers undertaking energy saving activities. The modelling assumes 100 per cent participation when calculating the uptake of measures required to meet the target, and the associated cost. In reality this outcome is unlikely to be met as Tier 2 retailers have an opportunity to pay a simplified contribution fee (at the calculated average cost of abatement for a Tier 1 retailer) rather than undertake activities.

While changes to the legislation have been drafted to increase opportunities for Tier 2 retailer participation, these changes will be phased-in over time, and it is anticipated that Tier 2 retailers will initially continue to pay an energy savings contribution. It is expected that this would have the net effect of making the costs conservative, as reduced participation by Tier 2 retailers would result in more cost-effective opportunities being available to ActewAGL Retail.

Assuming that all Tier 2 retailers elect to pay the Energy Savings Contribution, rather than undertaking activities, the actual targeted abatement resulting in a changing market share for ActewAGL are provided in Table 3.

Table 3: Changing market share sensitivity analysis

ActewAGL market share	GHG abatement (ktCO₂-e)
100 %	515
80 %	412
70 %	354
60 %	309

Selected scenario – summary of modelling results

Electricity price impacts

Electricity retailers participating in the Scheme are expected to pass-through a proportion of their compliance costs to government, business and residential electricity customers through electricity bills. For modelling purposes this proportion is assumed to be 100 per cent. At the proposed target level, the pass-through cost associated with the EEIS is estimated at \$3.80/MWh.

How these changes translate to estimated impacts on households and businesses is discussed in further detail below.

Modelled versus likely costs and benefits

It is important to note that financial and environmental benefits associated with the Scheme are likely to differ from the modelling. The modelling assumes a 100 per cent participation rate by retailers and a 100 per cent pass through of estimated compliance costs. Estimated energy savings must be discounted from the modelled amounts to reflect that a proportion of the targets are expected to be met by Tier 2 retailers paying an Energy Savings Contribution, rather than undertaking activities.

Cost of living impact – household costs and benefits

Modelling at the recommended target level demonstrates net-savings for households on average – noting that, as not all households will participate, actual household savings are expected to be higher. It is important to note that while costs associated with the scheme will end with the end of the scheme, savings will continue to accrue for the lifetime of the implemented measures. Aggregate lifetime bill savings for the Residential sector are estimated at \$106 Million in present value terms – noting savings are extremely sensitive to Tier 1 retailer market share and future energy prices.

In addition, due to the design of the Scheme, which requires that a proportion of total Tier 1 retailer energy savings be achieved in priority households, a defined proportion of the benefits will continue to accrue in these households – proposed to be set for 2016 at 20 per cent.

Table 4: Household Costs and Benefits

Pass-through cost 2016 to 2020 (\$/MWh)	Average Household Price Increase	Lifetime Residential bill savings (\$M - NPV)	Average Bill Cost 2016 – 2020 (\$/week)	Average Bill Savings in 2020 (\$/week)
\$3.95	2.32%	\$106	\$0.62	\$3.19

Summary of business costs and benefits

Estimated average costs and benefits for business are more difficult to determine than in the residential sector due to the significant differences in the nature and extent of energy use between

different businesses. The broad range of impacts, depending on annual electricity spend, are summarised below. Total bill savings expected to accrue over the lifetime of EEIS measures implemented in this sector are estimated at \$191 Million in present value terms.

While the total GHG savings expected in the residential sector are higher than the business sector, the total bill savings are expected to be higher in the business sector due to higher electricity savings in the business sector, and the higher value of electricity bill savings.

Table 5: Range of Business Pass-through Costs

Annual electricity spend of \$1,000	Annual electricity spend of \$10,000	Annual electricity spend of \$100,000	Annual electricity spend of \$1,000,000
\$15	\$151	\$1,514	\$15,143

Impact on service provider sector

It is anticipated that the industry delivering energy efficiency activities will grow to meet the increased demand created by the EEIS, however, it is difficult to predict the extent of this impact. Providing future opportunities to facilitate third-party participation and to directly align with activity requirements under other jurisdictional schemes is expected to diversify the range of services delivered by the industry in the ACT and provide additional opportunities to those businesses operating in this sector.

Impact on Scheme Administrator

While diversification of the energy efficiency industry, and broadening the EEIS for third-party participation and alignment with other jurisdictional schemes, may be positive for the ACT economy in the long term, the conduct of retailers, businesses and individuals implementing energy efficiency measures create inherent risks to property, life and the environment. These risks must be carefully managed, and it is proposed that an increase in energy efficiency activities provided for under the Scheme should be accompanied by an appropriate regime of technical inspection and the development of new training or other educational material for providers and consumers.

The future funding of the EEIS Administrator beyond 2015-16 will be subject to a future budget consideration, noting future Tier 2 funds are expected to continue to cover administration costs into the future.

Retailer Costs

Tier 1 retailer costs

A retailer’s obligation (in tonnes CO₂-e) is calculated as:

$$Energy\ Savings\ Target\ (\%) \times Emissions\ Multiplier \times Retailer\ Sales\ (MWh)$$

At the targeted level of ambition, the estimated average cost of compliance for a Tier 1 retailer is \$116 per tonne of CO₂-e. This includes an allowance for the 20 per cent Priority Household Target, which is assumed to be 50 per cent more expensive on a dollar-per-tonne basis to achieve.

The modelled average for 2016 to 2020 represents an apparent increase in the estimated cost in 2015 of \$41 per tonne of CO₂-e for the ACT's single Tier 1 retailer, ActewAGL. However, noting a retailer's CO₂-e target is calculated using the emissions factor and the overall scheme Energy Savings Target (both of which are proposed to reduce in 2016), the total anticipated cost of compliance for a Tier 1 retailer remains similar.

The ongoing costs associated with the implementation of the EEIS will continue to be monitored over the period 2016 to 2020, along with the Energy Savings Target and Emissions Multiplier.

Tier 2 retailer Energy Savings Contribution

Smaller Tier 2 retailers are able to pay an Energy Savings Contribution (ESC) to meet their obligation under the EEIS. This is in recognition of the increased difficulty for smaller retailers to deliver energy savings in the ACT. A Tier 2 retailer's target is calculated in the same way as a Tier 1 retailer target.

The ESC is set by the Minister by Disallowable Instrument to the Act and is currently set at \$37 per tonne CO₂-e. This is based on the original modelled expected average cost of compliance for a larger, Tier 1 retailer. Based on the modelling for the new target scenario, it is appropriate to set the Tier 2 Energy Savings Contribution at the average expected average cost of compliance for a Tier 1 retailer, at \$116 per tonne CO₂-e. This figure will continue to be monitored for appropriateness based on the actual experienced costs of Tier 1 retailers undertaking EEIS activities.

Shortfall Penalty

The penalty for a retailer not achieving their Energy Savings Target or Priority Household Target in a compliance period is currently set in the Act at \$70 per tonne of CO₂-e of a retailer's target not achieved. This was set to be slightly higher than the expected maximum amount a retailer would pay per tonne of CO₂-e abated.

Under the modelled continuation of the EEIS at the targeted level of ambition, it is anticipated that the maximum cost a retailer would pay per tonne of CO₂-e abated is \$300/tonne of CO₂-e. This increase reflects the decreasing emissions associated with saving electricity in the ACT, and the associated increase in the cost per tonne. Drafted changes to the legislation allow this figure to be set by the Minister by Disallowable Instrument, allowing this figure to be monitored and adjusted as necessary based on the actual experience of implementing the EEIS – noting the Minister must take into consideration the Objects of the Act in setting the shortfall penalty.

As a reference test, whilst highly unlikely, if the entire 2015 EEIS CO₂-e target was paid by retailers at the 2015 penalty rate, this would be a similar total cost to paying the entire 2016 EEIS CO₂-e target at the 2016 penalty rate.

Summary of changes proposed to key scheme parameters

Disallowable Instruments

In order to effectively target the level of energy savings proposed above, key scheme parameters must be re-set for the period 2016 to 2020. These parameters are set by the Minister by Instrument.

It is acknowledged that there is some degree of uncertainty regarding the future costs associated with the continuation of the EEIS to 2020, especially in light of the changing emissions factors and the impact this has on the overall scheme, as it is difficult to predict how the market will respond and the innovative solutions retailers and service providers may develop.

All key parameters outlined below are subject to the Minister making a determination under the Act (by Instrument) following the passage of the Amendment Bill. All parameters will continue to be monitored for ongoing suitability based on experienced Tier 1 retailer costs and changing market circumstances.

Instrument	Proposed Value	Period
Energy Savings Target	8.6% (each year)	2016 to 2020
Priority Household Target	20% (each year)	2016
Emissions Multiplier	0.4	2016 to 2020
Energy Savings Contribution (Tier 2 Retailer)	\$116/tonne CO ₂ -e	2016 to 2020
Shortfall Penalty (non-compliant Retailers)	\$300/tonne CO ₂ -e	2016 to 2020

Included measures 2016 – 2020

As previously identified, the abatement associated with undertaking individual activities will also be influenced by the declining Emissions Factor for electricity in the ACT. While the model assumes high level abatement values for categories of activities, actual abatement values for specific EEIS eligible activities (and categories of products within these activities) are being evaluated by the EEIS Administrator, and will be finalised once the EEIS is extended to 2020.

It is important to note that the results of this modelling exercise, with the inclusion of a lower Emissions Factor for electricity, has identified that activities encouraging future fuel switching from gas to electricity are unlikely to produce positive abatement results in the EEIS beyond 2015.

Appendix A – Stakeholder Feedback Summary and Discussion

Category	Stakeholder Feedback	Discussion	Proposed Changes
Overall support for continuation	<p>Stakeholders broadly support the continuation of the EEIS, with many recommending further harmonisation with other schemes, however, two electricity retailers suggested the Commonwealth Government's direct action scheme would replace the need for the ACT's EEIS.</p>	<p>Direct action is expected to focus only on activities benefiting very large/commercial users in the short to medium term. Households and SMEs are unlikely to benefit from Direct Action (as activities in these sectors are likely to be more expensive and therefore not successful through the ERF auction process), while significant energy savings remain in these sectors.</p>	<ul style="list-style-type: none"> - Continue scheme. - Continue to improve complementarity of EEIS and ACTSmart.
	<p>One electricity retailer suggested that anticipated tariff reforms would provide adequate incentive for retailers to encourage efficient network use, and that retailers are already well placed to provide energy efficiency solutions where beneficial to consumers without specific energy efficiency schemes.</p>	<p>Whilst tariff reform remains an important tool for improving consumer and retailer response to pricing, these reforms will not be finalised in the short-term and retailers are unlikely to have sufficient incentives to drive the energy efficiency beyond the level that delivers demand management benefits that accrue specifically to retailers and networks – i.e. through reducing peak demand, but not overall demand. Ongoing progress and impact of these reforms should be progressed in tandem with supporting the uptake of cost-effective energy efficiency measures.</p>	
	<p>One retailer noted that while the benefits accrue to only a subset of consumers, the costs are shared by all consumers, suggesting this made the scheme inequitable.</p>	<p>All consumers can benefit from reduced energy consumption in the ACT - reducing overall demand and required network investment. It is also considered feasible that all households could participate in some form over the life of the scheme. Ongoing support for energy efficiency will also reduce the cost of products and services for all consumers over time.</p>	
	<p>Stakeholders noted the relationship between various ACT Government programs and measures could be better articulated.</p>	<p>Ensure the role of ACTSmart as a provider of information and services to those areas of the community that are most difficult to reach/are not reached by the EEIS is clearly identified and the Government continue to improve the complementarity of these programs.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
<p>Scheme Length and Targets</p>	<p>Most stakeholders agreed with extending the EEIS to at least 2020 to provide investment certainty to encourage companies to establish in ACT. Some stakeholders noted the possibility of extending the EEIS to 2025 to align with NSW ESS. Stakeholders also generally supported ongoing evaluation and review of appropriate targets, with retailers noting suitable notice must be given for setting future targets.</p>	<p>To provide ongoing certainty and reduce the administration associated with the scheme's continuation, it is recommended the scheme be notionally extended to 2020, with targets set for that period (by Disallowable Instrument). It is recommended that, rather than a review being scheduled at this time (noting continual formal reviews increase uncertainty and costs for all stakeholders), targets be monitored and reviewed on an ongoing basis to ensure they are aligned with overall policy objectives.</p>	<ul style="list-style-type: none"> - Amend the Act to extend the EEIS to 2020. - Determine targets to 2020 based on CBA and set by Disallowable Instrument. - Amend legislation to provide for at least 6 months notice of any changes to targets that increase the activity required for retailers.
	<p>Some stakeholders suggested the target should continue at their current levels or increased to capitalise on current success and as the number and breadth of activities can be expanded - including commercial lighting - to reduce costs.</p>	<p>Targets should be determined on the basis of cost-benefit analysis modelling currently being undertaken by EPD.</p>	
	<p>One retailer suggested large consumers (>160MW) should be excluded from a retailer's target as these customers are incentivised to undertake activities without the EEIS.</p>	<p>This change would transfer costs from large consumers to small business and households, including low income households.</p>	
	<p>There may be a benefit in aligning EEIS targets with the per-capita (non-renewable) energy use target required to be set under the <i>Greenhouse Gas Reduction Act 2010</i> (noting this target has not previously been set).</p>	<p>Whilst the EEIS will contribute to reducing all (renewable and non-renewable) energy use, reducing non-renewable energy use will primarily be achieved through the 90% renewable energy target. Opportunities to further align targets should, however, be considered in the future in undertaking work to set the per-capita energy target.</p>	
	<p>One stakeholder noted retailer performance could also be measured against achieving multiple benefits (for example providing education during visits).</p>	<p>This would be difficult to set a target against and assess (and doing so could add to implementation costs). It is recommended that the requirement to provide education where appropriate about particular appliances or activities be maintained on an activity-by-activity basis.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
	Stakeholders noted activity uptake becomes saturated beyond around 30% of all households. As there is a limit to the uptake of current activities stakeholders noted that any change to targets must be accompanied by an increase in number of available activities.	It is recommended this be considered as part of the ongoing evaluation and review program and the current consultative process for including new activities.	
Priority Households	A number of stakeholders noted that it is low-income households that stand to benefit the most from energy efficiency but who are least able to make improvements without additional assistance.	Ensuring energy savings are achieved in these households remains a Government priority.	<ul style="list-style-type: none"> - Review cost impact of maintaining current 25% priority household target. - Reduce priority household target to 20% and maintain this rate to 2020, subject to ongoing review for appropriateness. - Maintain complementary outreach program services to vulnerable households. - Continue to monitor rental uptake of the EEIS.
	Some stakeholders suggested that a separate target is unnecessary as long as there are free or low-cost activities in the scheme as priority households will naturally participate in these activities. ActewAGL identified that in their estimate, over 50% of priority households have already participated in the EEIS (with free activities), meaning that it would be difficult to continue to meet the current 25% target as the cheapest activities are no longer available (therefore increasing overall costs).	It is recommended a priority target be maintained to ensure that, particularly as the activities being implemented change, low-income households continue to benefit from the EEIS.	
	A number of stakeholders identified that in setting a priority household target, it is important that it is not so onerous that it increases costs/risks other objectives of the EEIS. It was also recommended that targets should be monitored for changes in the economic environment and the availability of other assistance. Supporting programs such as the Outreach assistance were noted as remaining important to help those most in need.	<p>Noted. It is recommended this be considered as part of the ongoing evaluation and review program. In addition, options to expand the definition of eligible households will be considered on an ongoing basis in collaboration with community organisations. In particular, there may be an opportunity to strengthen pathways between current ACTSmart programs and community service providers.</p> <p>Given the strong incentive for Tier 1 retailers to exceed PH targets, and the need to not over-inflate costs of the scheme, it may be appropriate to reduce the priority household target – taking into consideration the take up of activities in these homes to date. This will ensure that these groups are disproportionately benefitted by the scheme.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
	<p>An alternative proposal was to use a 'multiplier' to encourage activity in these households, however, this was largely seen as being distortionary and reduce the real energy savings associated with the EEIS.</p>	<p>It is agreed that using a multiplier would distort the outcomes achieved by the scheme and, unlike setting a firm target, would not guarantee that priority households benefit from the scheme.</p>	
	<p>It may be useful to have a dual target for priority households - an absolute target and a proportional target to allow greater flexibility.</p>	<p>This could be achieved under the current regulatory framework, however, further consultation with retailers would be required to determine the practical implications of a dual target. It is, however, likely to be difficult to set an absolute target if there is more than one Tier 1 retailer in the future. In addition, the current 'percent target' functions to ensure low income households are proportionately represented in the scheme.</p>	
	<p>Some stakeholders also noted that ACT housing tenants and renters generally may not be able to access the full benefits of the Scheme as they do not own the premises and consideration should be given to ensuring they continue to be able to benefit from the EEIS.</p>	<p>Currently 23% of households participating in the scheme are renters – which represents a reasonable proportion of the estimated proportion of rental households in the ACT (30%). As these households represent 30% of all households, targeting these households will continue to remain important to retailers. There are a number of activities currently being implemented under the EEIS that do not require permanent changes to the residence, and there are a number of future opportunities remaining for retailers in this space. It is important to note that Housing ACT also has an upgrade program, and the Government is considering options to require the provision of energy efficiency information for prospective tenants, the Government will continue to monitor rental uptake of the EEIS and the available suite of options for renters to reduce energy use.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
	<p>Energy affordability can be addressed through education, behaviour change and specific hardship programs.</p>	<p>It is recommended education, behaviour change and hardship programs (through ACTSmart and retailer requirements) be maintained as complementary to implementing broad-scale energy efficiency upgrades through the EEIS. Noting it is difficult to measure the outcomes resulting from education and behaviour change programs, progress on implementing such measures in other schemes will be monitored for success.</p>	
Scheme metric	<p>Stakeholders noted that the current GHG metric (CO₂) is well understood across schemes and maintaining provides participants with certainty. Some stakeholders noted changing to a non-energy or CO₂ metric could create unnecessary confusion and would require some changes to retailer's systems. Stakeholders noted the EEIS should focus on alignment with other schemes and ensure the outcomes sought by the EEIS are clear. The EEIS should seek to minimise the number of assumptions required to determine the key parameters of the scheme, noting the importance of the metric is in some ways impacted by the length of the scheme and the anticipated lifetime of energy savings associated with the activities undertaken.</p> <p>Any metric should ensure switching from electricity to gas is not encouraged - which can be the case with GHG metrics.</p>	<p>Alignment with other schemes where possible remains an important objective for the EEIS – noting other differing policy setting may prevent absolute alignment in this case. In order to meet these objectives and reduce changes and assumptions underpinning the scheme, it is recommended the current GHG metric be maintained, but the emissions factors be updated to reflect the 90% renewable energy target and retailer targets be scaled accordingly.</p> <p>Agreed - this can be addressed by reconfiguring the GHG metrics to reflect the ACT's 90% renewable energy target.</p>	<ul style="list-style-type: none"> - Update electricity emissions factor to reflect 90% renewable energy target. - Update targets and activities (set by instrument) to reflect changes to emissions factors.
Activities and third party participation	<p>Whilst stakeholders were generally supportive of aligning schemes and activities where possible, ActewAGL noted leveraging activities from other jurisdictions means changes in these jurisdictions can have implications for EEIS activities (ActewAGL believes changes to VEET SPC values did not need to be applied in the ACT).</p>	<p>Alignment with other schemes decreases costs for all parties, however, all activities under the EEIS are set specifically for the ACT and can differentiate from activities in other schemes - meaning changes in other jurisdictions do not automatically apply here. The EEIS does, however, draw on ongoing and improving experience from other jurisdictions and it is prudent to apply these lessons in the ACT where possible where there is not evidence to support a contrary experience in the ACT.</p>	<ul style="list-style-type: none"> - Adapt and adopt NSW commercial lighting tool – if possible through NSW's certificate registry system, by providing options for this in the EEIS legislation;

Category	Stakeholder Feedback	Discussion	Proposed Changes
	<p>Expand to include home energy management systems to take advantage of emerging changes in NEM in relation to pricing reform and competition in metering.</p>	<p>Saving energy through the use of an in-home display requires action to be taken by the occupants and there is considerable debate about the robustness of the estimates of the savings due to in-home displays and their persistence. An in-home display tends to have limited impact if not coupled with some form of smart metering and/or dynamic pricing (e.g. peak time rebate, critical peak pricing) which are currently not available in the ACT. Emerging opportunities will be monitored and implementation in the future considered if these facilitating mechanisms become available in the ACT.</p>	<p>Refer barriers to showerhead and flow restrictor improvements to technical regulator.</p> <p>Amend the Act to allow the Administrator to recognise certificates created under other recognised jurisdictional schemes (when activity is undertaken in the ACT) – with details to be settled subsequently by instrument.</p> <p>Amend the Act to allow the Administrator the flexibility to approve third party participation and creation of eligible greenhouse gas abatement – with details to be settled subsequently by instrument.</p> <p>Assess impacts on administrator</p>
	<p>NSW has moved to specify that multiple activities must be undertaken in a house in order to claim abatement, and that the household must contribute a co-payment. Some stakeholders noted this is expected to be unviable for delivery while other more-straight forward and cost-effective activities are available (such as commercial lighting). However, it was also noted that some activities - such as draft proofing - may benefit from requiring a more comprehensive undertaking.</p>	<p>Emerging activities in other jurisdictions will continue to be monitored for successful implementation and uptake and be considered for inclusion under the EEIS in the future.</p>	
	<p>While some stakeholders noted that education and awareness programs are less effective in achieving direct outcomes, other stakeholders noted a formal information and education component, or the inclusion of audits, could be beneficial.</p>	<p>Energy audits may facilitate, but do not directly result in, the implementation of energy efficiency activities - therefore it is not possible to justify the significant additional cost this would impose on the EEIS and consumers. The ACT Government will maintain the information and audit services provided to the most disadvantaged households through the Outreach program, as well as the ACTSmart Home Energy Advice service.</p>	
	<p>Noting there is currently limited opportunities for SME participation, a number of stakeholders recommended the inclusion of commercial lighting upgrades to improve expansion to this sector.</p>	<p>It is agreed that commercial lighting upgrades represent an important opportunity for energy savings in the SME sector. It is recommended that the EEIS seek to draw on the comprehensive NSW ESS commercial lighting activity.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
	ActewAGL noted that the requirement that a licensed tradesmen install showerheads and flow restrictors significantly increases delivery costs, and recommend Authorised Installers be able to undertake these activities.	This is a requirement of the plumbing regulations and therefore these requirements cannot be waived for EEIS activities only, however these issues should be referred to the technical regulator for further consideration.	resourcing associated with allowing greater third party participation and consider a trial of a limited viable and low-risk activity before extending further. Amend the Act to clarify when a Tier 2 retailer becomes a Tier 1 retailer.
	Activities should focus on encouraging the switch to highly efficient electrical systems - rather than encouraging a switch to gas.	Agreed - this can be addressed by removing activities that expressly allow switching and reconfiguring the GHG metric to reflect the ACT's 90% renewable energy target.	
	ActewAGL also noted that they had previously provided a range of activities suggested for inclusion/amendment under the EEIS.	A number of requested changes have been implemented to date, and the Administrator is undertaking work to progress the implementation of additional activities as appropriate.	
	Some stakeholders noted that certificate-based schemes would provide easier participation for 3rd party providers, decrease the disproportionate risk on retailers, provide greater incentive for active tier 2 retailer participation and create more competition in the efficient delivery of services. Others noted that maintaining the obligation on the retailer to undertake activities ensures quality of activity delivery as they have greater incentive to protect their brand. Alternatively, it was noted that in any arrangement, the best way to ensure quality of any activities delivered through the EEIS is a targeted and effective audit and compliance program.	NSW ESS and Victorian VEET Schemes have established certificate registries that could possibly be used for EEIS with agreement from those schemes. In particular officer-level discussions with NSW indicate it may be possible for certificates created in the ACT to be processed through the NSW registry. It is recommended the provision be made in the EEIS legislation to recognise certificates created in the ACT under other schemes as well as to allow third party participation, and discussions be progressed with NSW to initially allow certificate creation in the ACT for commercial lighting. Pending monitoring the success of implementation and take-up this could then be extended to other activities and schemes, by regulation/instrument as appropriate.	

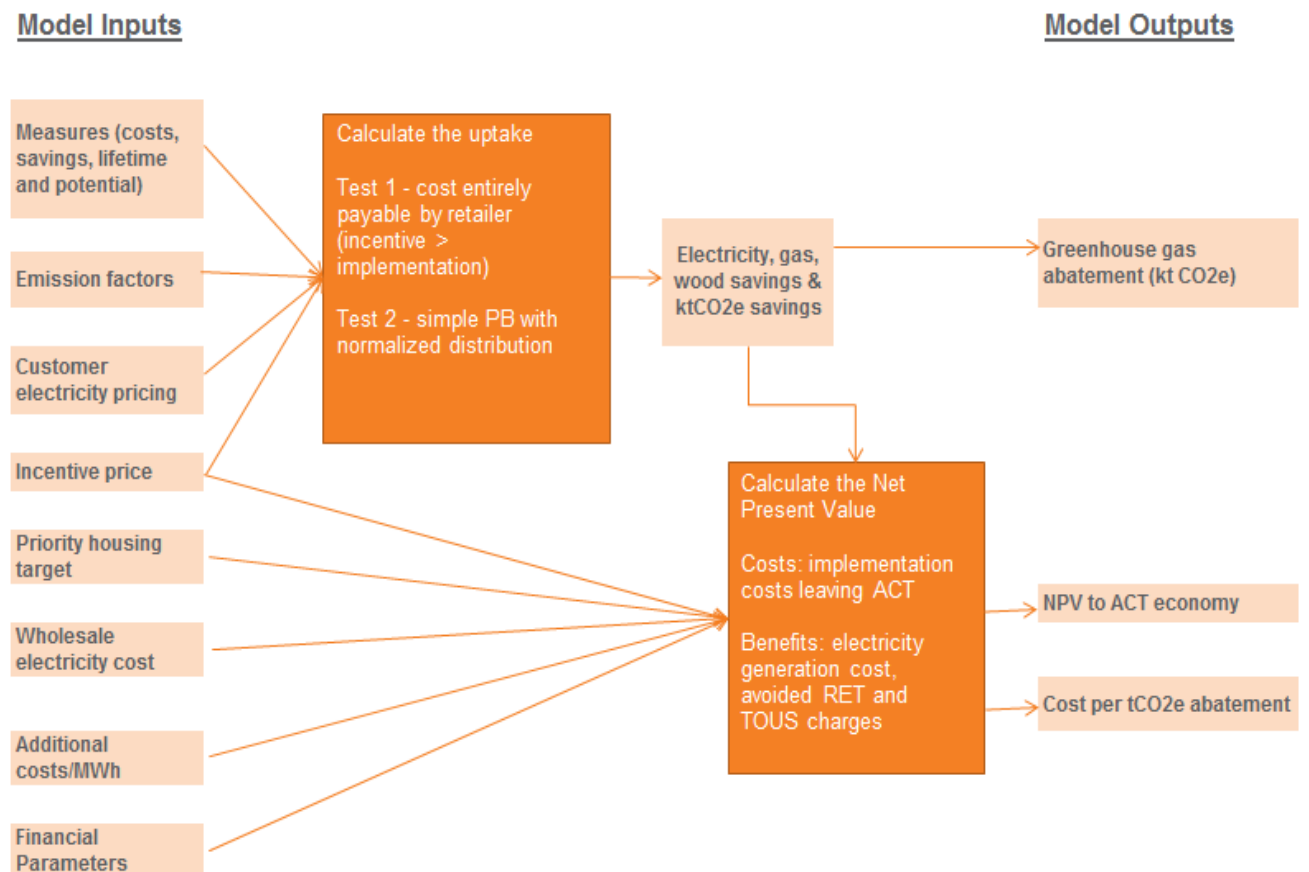
Category	Stakeholder Feedback	Discussion	Proposed Changes
	<p>A clear understanding of the risk assignment between participating parties (retailers and 3rd parties) would be required - which could be managed through a qualification and partnership agreement process, managed by ACT Government. In line with this it was noted that increasing 3rd party participation would require adequate resourcing of the administrator to ensure adequate consumer and business protections.</p>	<p>As above.</p>	
<p>Other</p>	<p>The process for transitioning from being a Tier 2 to Tier 1 retailer currently means Tier 2 retailers must be able to accurately predict their future market position to determine their compliance requirements, which is difficult. It was recommended that this should be clarified in the Act so that Tier 2 status is applied in the compliance year following triggering thresholds.</p>	<p>The current process is the result of an ambiguity in the Act. It is recommended that the Act be amended to provide a transparent and practical process for retailers transitioning from Tier 2 to Tier 1.</p>	<ul style="list-style-type: none"> - Amend the Act to clarify when in a compliance year a Tier 2 retailer becomes a Tier 1 retailer. - Administrator to provide quarterly updates on activities (noting information may be subject to change).
	<p>A concern was raised that the Administrator can 'require any other information reasonably required by the administrator to help the administrator work out if a retailer has met the retailer's obligations' and that the information keeping requirements are too open and requested that further clarification and transparency in the codes of practice be provide.</p>	<p>The record keeping requirements are a DI made by the Scheme Administrator and are currently designed to avoid being overly prescriptive. The reason for this is that availability of information may change and industry is best placed to determine what information and evidence they are able to keep and store to support their claim for abatement. It is recommend close consultation with the Administrator be maintained and strengthened to determine a mutually agreeable requirements on an activity-by-activity basis as required. It remains essential that the Administrator be able to request further (reasonable) information to ensure compliance with the EEIS requirements.</p>	
	<p>Real-time or timely reporting of savings achieved by the EEIS should be prioritised to ensure the public are informed of the positive work being undertaken by the Government and retailers.</p>	<p>More up-to-date information will be provided on the Directorate's website regarding progress on the EEIS (noting the Administrator receives updates on this quarterly) - similar to the information provided in the Annual Report.</p>	

Category	Stakeholder Feedback	Discussion	Proposed Changes
	The Government should introduce minimum standards for rental properties.	The Government is considering the most efficient and cost-effective way to improve the energy efficiency of rental properties in the ACT market. In particular, the Government is considering options to require the provision of information about the energy efficiency of properties available for rent.	
	Changes to codes should have a minimum 2 month notice period and 6 months for legislatives/scheme changes	The Administrator endeavours to consult on and provide advanced notice of any changes to the codes and policy settings - an example of this is the long and gradual phase in of lower abatement values for standby power controllers. It may not always be possible, however, to meet longer timeframes for notice if reacting to an urgent safety or administrative issue. It is recommend close consultation with Administrator and Directorate be maintained and strengthened to ensure retailers are aware of upcoming changes as soon as possible.	

Appendix B – Summary of Modelling Approach

In summary, the model developed by Energetics uses a range of inputs, calculates the uptake and resulting energy savings at a maximum incentive price and from this the economic benefits to the economy as a whole and energy consumers, as shown below.

Figure 2: Summary of model inputs and outputs



Parameters in the model

Certain key parameters that influence the design of the ex-ante impact assessment model as used in the initial modelling of the EEIS, and as driving the expected results, were considered in modelling to extend the EEIS. The most important one to consider was the nature of the financial tests that are used to assess the likely uptake of energy efficiency measures. It is important as it influences both the design of the model and also the choice of other global parameters.

Financial tests to establish forecasts of uptake

These financial tests need to reflect the characteristics of the scheme if the forecasts of uptake of energy efficiency activities are to be robust. The approach used to describe uptake in the earlier models of the EEIS did not reflect the approach used by ActewAGL to implement the scheme. The model considered interest in pursuing energy efficiency to be a function of the fraction of the capital cost that is covered by the sum of the incentive payment and some multiplier of the bill savings

achieved in the first year following implementation. With this, the model could forecast that an expensive measure that offers significant early savings will be taken up. However, ActewAGL does not benefit from the bill savings and so will rather focus on energy efficiency measures where the incentive payment is a significant portion of the implementation cost.

Consumers are not currently required to make any payment for energy efficiency activities, which may limit the ability of the EEIS to undertake more expensive measures in the future. This is particularly challenging in markets where split incentives exist.

Including a portion of bill savings in the incentive therefore better describes uptake if those receiving the benefits (i.e. the energy users) are required to pay a portion of the cost of the measure. This will be the case for most energy efficiency measures included in the modelling of the existing scheme. It will also be the case if commercial lighting upgrades are added to the expanded scheme. In cases where the customer is required to make a contribution, assessments of financial return will be an influencing factor. Energetics has shown how the behaviour of residential and SME customers can also be modelled using conventional payback and noting that the payback thresholds applied in the model must be low to successfully describe the actual take up of energy efficiency measures. Paybacks of less than a year can be necessary in some cases to correlate with actual uptake of incentive schemes. A measure where the incentive payment fully covers the implementation cost is seen as having a payback of zero years and so is fully taken up (subject to market/industry capacity constraints).

The modelling of the revised scheme therefore uses the payback period as the financial test to determine uptake. Therefore, the threshold is the payback needed to realise a 50% uptake of the technical potential of the measure. Energetics model the payback as a normal distribution centred on the threshold where 50% of participants will take up the measure.¹³ The average payback threshold for the SME sector is 1.75 years in normal economic conditions, one year in pessimistic economic conditions and 2.5 years in optimistic economic conditions.¹⁴ A payback threshold of less than two years for SMEs is therefore assumed.

The payback threshold for the residential sector is more difficult to determine. The evidence suggests that it is no greater than the payback threshold for the SME sector, and could be less than one year i.e. the savings in the first year need to cover the cost of the energy efficiency upgrade. A payback threshold of one year for the residential sector is therefore used.

Energy price forecasts

Energy prices are needed for two purposes and over two time horizons. First, the energy price influences the decision to pursue an energy efficiency measure in cases where the participant must contribute to the cost of the measure (i.e. the participant cost test). The previous section outlined the payback thresholds of one year for residential customers and less than two years for SME business customers. Participants will therefore only consider retail energy prices over that one or

¹³ This means that the economic potential of the measure (i.e. the number of instances where it makes financial sense to implement the measure) is 50% of the technical potential. The actual take up of the measure is still subject to the ability of the market to respond i.e. to provide enough installers to implement the measures.

¹⁴ "Energy use and energy efficiency opportunity data for commercial sector and small/medium businesses: Summary of Results", Department of Climate Change and Energy Efficiency, July 2012

two year period when assessing the value of the investment. It is reasonable to conclude that the model need only consider retail energy prices over the same one to two year period.

The calculation of the benefits/avoided costs to the whole ACT economy of the scheme (i.e. for the total resource cost test) also uses energy prices, but in this case these prices are the ones seen over the expected useful lifetime of the implemented measures. To a first approximation, the network and retail components of energy prices remain with the ACT and so do not need to be considered in the cost effectiveness analysis (internal transfers within the ACT). However, the wholesale component of energy prices is a net charge on the ACT economy. External environmental levies such as the RET are also a cost. Therefore the model needs to consider wholesale energy costs over many years.

The figure below shows how electricity use in the ACT is dominated by the general purpose residential tariff and low voltage business tariffs.

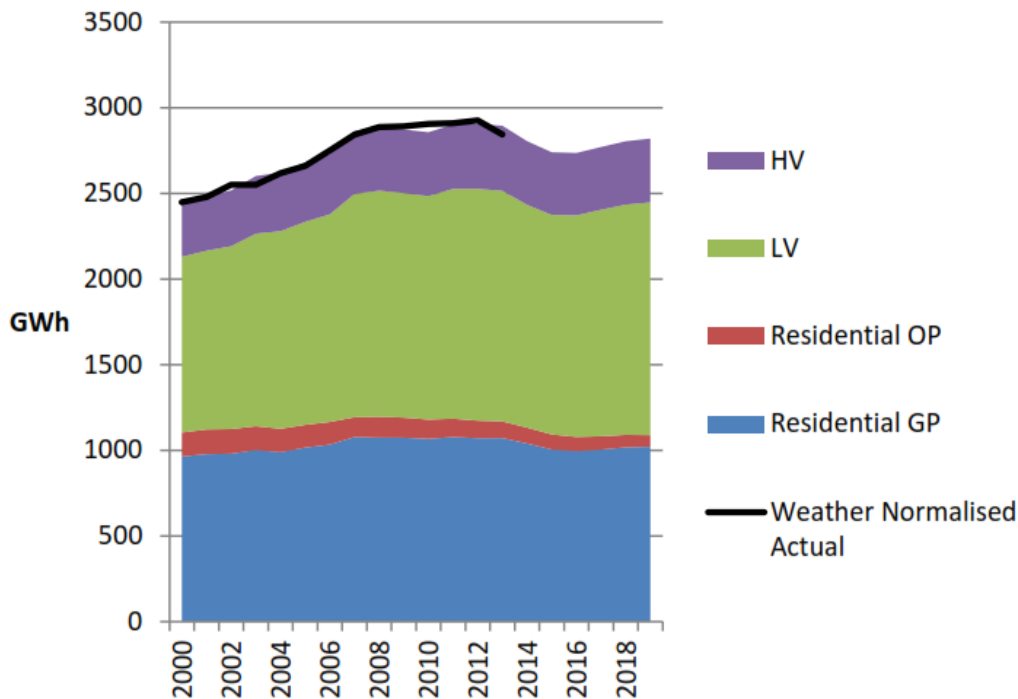


Figure 3: Total energy forecast for the ACT¹⁵

As the modelling of the EEIS extension needs to consider the prices seen by participants for no more than three years into the future, Energetics based the retail prices on the current ActewAGL retail price schedule as follows.

¹⁵ Source: "Trends in ACT Electricity Consumption", Jacobs SKM, 12 May 2014

Table 6: Proposed retail energy prices for the purpose of modelling the scheme

Sector	Fuel	Marginal energy price	Comment
Residential	Electricity	18.3 c/kWh	
SME	Electricity	24.62 c/kWh	This is the “Business” tariff. The various time of use tariffs offer lower rates at off-peak times but higher peak rates.
Residential	Natural gas	2.4464 c/MJ	
SME	Natural gas	2.2165 c/MJ	

It is assumed that the prices remain constant in real dollars.

When applying the total resource cost test, Energetics used the wholesale energy price projections that were developed by ACIL Allen Consulting for the recent modelling of the Renewable Energy Target scheme. The next figure shows the wholesale electricity prices.

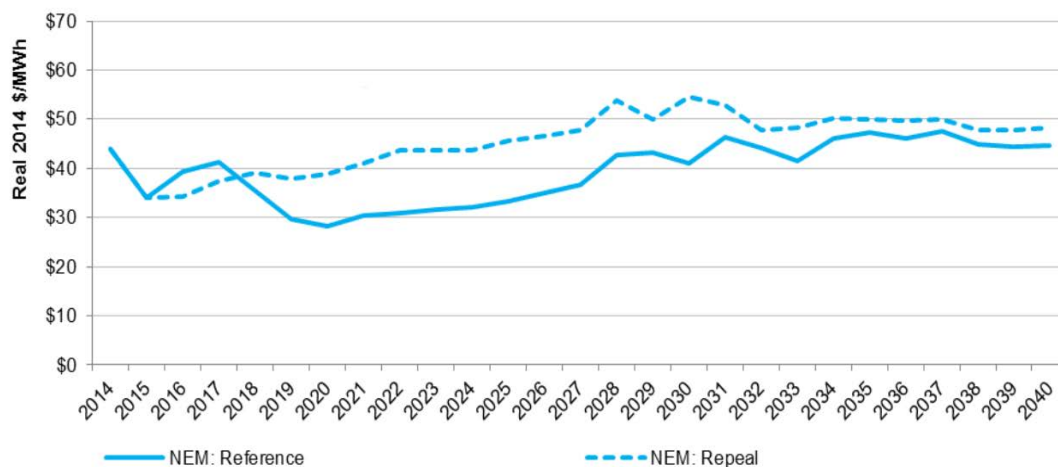


Figure 4: Proposed wholesale electricity prices¹⁶

¹⁶ “RET Review Workshop: Preliminary Modelling results”, ACIL Allen Consulting, June 2014

The long term wholesale gas prices on the LNG netback price are used as shown below.

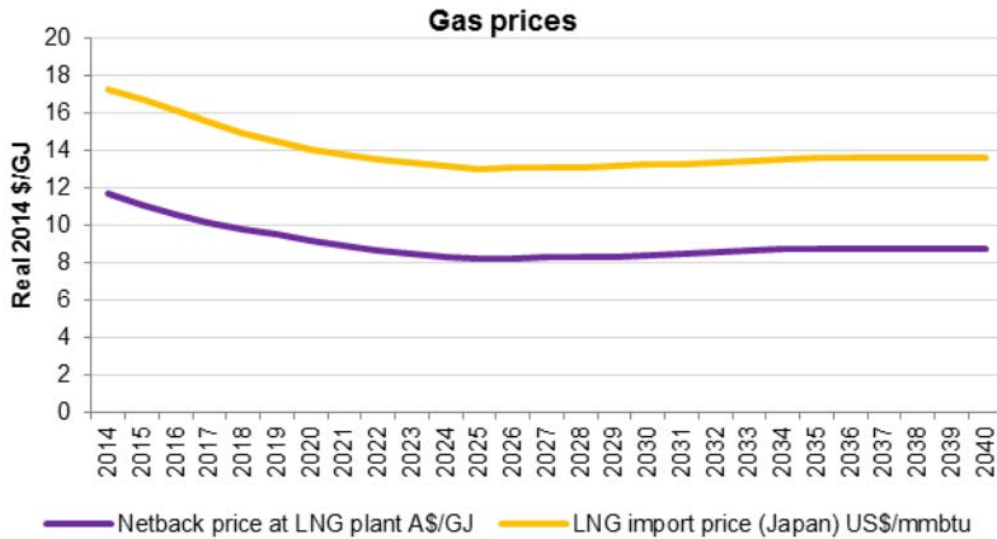


Figure 5: Proposed wholesale gas prices¹⁷

Measure take-up and pay-back periods

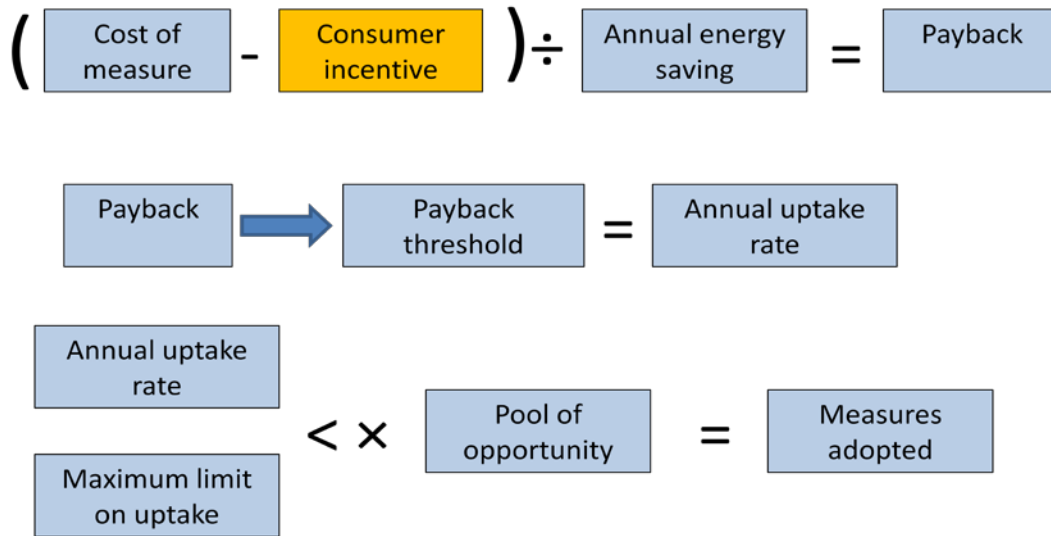
The model first assesses the savings for each fuel type due to a single instance of the measure. This includes the application of a possible annual decay of savings relative to the initial savings.

The year-by-year take-up of the measure is then modelled. This requires the calculation of the bill energy savings and the value of the incentive payment. The latter is derived from the expected lifetime abatement and the incentive payment per tonne of abatement. The payment per tonne is capped so that the total incentive does not exceed the cost of implementation. Once the total incentive is known (the sum of the incentive payment and the bill savings) the take-up can be calculated from a predefined take-up curve.

Once the year by year take-up is known, the year by year total energy, cost and emission savings are calculated. Adding in the implementation cost allows for the calculation of the net cash flow of the measure from the perspective of the ACT. Finally the overall outcomes of the measure are calculated. These include the net present value (NPV), the lifetime abatement and the average abatement cost.

¹⁷ “RET Review Workshop: Preliminary Modelling results”, ACIL Allen Consulting, June 2014

Figure 6: Summary of measure uptake in model



Included measure summary

The high-level measures included in the uptake model, and the average abatement associated with each measure implemented, is summarised below – noting the abatement values associated with specific eligible activities, and individual requirements, under the EEIS post-2015 are being reviewed.

Measure Name	Average Abatement	Unit
Install insulating gas heating ductwork	18.14563802	t CO2-e/household
Decommission ducted gas heater and install HE equivalent	5.225600833	t CO2-e/gas heating system upgraded
Replace an existing shower rose with a low flow shower rose	0.750375604	t CO2-e/Low-flow shower rose installed
Hot water tap improvements	0.162928663	t CO2-e/household
Upgrade residential lighting	0.058295241	t CO2-e/lamp upgraded
Retirement of Pre-96 refrigerator	0.405687742	t CO2-e/Pre-1996 refrigerator removed
Install a SPC for AV equipment	0.282905078	t CO2-e/AV standby controller unit installed
Install HE pool pump	0.676571958	t CO2-e/HE pool pump purchased
CO. Hospitality - Lighting	17.84417098	t CO2-e/SME premises upgraded
CO. Hospitality - Refrigeration	5.808892635	t CO2-e/SME premises upgraded
CO. Hospitality - Water Heating	21.72696431	t CO2-e/SME premises upgraded

Measure Name	Average Abatement	Unit
CO. Small office - Heating and cooling	11.80569062	t CO2-e/SME premises upgraded
CO. Small office - Lighting	10.64261587	t CO2-e/SME premises upgraded
CO. Small office - Water Heating	18.48685692	t CO2-e/SME premises upgraded
CO. Small trade - Lighting	31.9949942	t CO2-e/SME premises upgraded
CO. Small trade - Refrigeration	3.608016647	t CO2-e/SME premises upgraded
CO. SME Industrial - Air Compressors	32.29556483	t CO2-e/SME premises upgraded
CO. SME Industrial - Lighting	16.56720042	t CO2-e/SME premises upgraded
CO. SME Industrial - Pumps	27.11081277	t CO2-e/SME premises upgraded
CO. SME Industrial - Water Heating	17.37931072	t CO2-e/SME premises upgraded

Appendix C – Scheme Metric Review

Background

The objectives of the *Energy Efficiency (Cost of Living) Improvement Act 2012* are to:

- (a) encourage the efficient use of energy
- (b) reduce greenhouse gas emissions associated with stationary energy use in the Territory
- (c) reduce household and business energy use and costs
- (d) increase opportunities for priority households to reduce energy use and costs.

If the emissions intensity of purchased electricity from the grid in the ACT was constant, then objectives (a) through (c) largely correlate. However, the recent review of the EEIS by Jacobs¹⁸ (the Jacobs’ report) questioned whether the EEIS aligned with broader ACT Government policy. It noted that:

The ACT Government also has a 90% renewable energy target, which means that the EEIS’s objective to “reduce greenhouse gas emissions associated with stationary energy use in the Territory” is expected to become redundant as the portion of the ACT’s energy provided by renewable sources grows. However the EEIS can help reduce energy use and costs and enable the 90% renewable energy target to be achieved sooner and with less cost.

The fact that the emissions intensity of grid electricity in the ACT is expected to fall over the period that the EEIS is in operation will break the correlation between objects (a) and (b) above, and so prompts this discussion of the appropriate metric for the scheme.

A major international study into the design of energy efficiency schemes has been undertaken by the Regulatory Assistance Project¹⁹ (the RAP report). The Appendix of this report included a comprehensive summary of design parameters for energy efficiency schemes from a number of jurisdictions. The key design parameter relevant to the metric of the EEIS is the “Energy Savings Target”. The next table summarises the relevant material in the RAP report.

Table 7: Metric for energy savings target

Metric	Number of schemes
Energy measured in GJ or MWh.	13
Emissions measured in tonnes of carbon dioxide equivalent	3
Other	3

¹⁸ “Energy Efficiency Improvement Scheme Review, EEIS Review: Final Report”, Jacobs, 13 August 2014

¹⁹ “Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes, Research Report Task XXII of the International Energy Agency Demand Side Management Programme”, Balawat Joshi, Regulatory Assistance Project, June 2012

The preference is for targets denominated in energy units. There are several points that are worthy of note:

1. Two of the three schemes that use an emissions based target are in Australia – the Victorian Energy Efficiency Target (VEET) scheme and the Retailer Energy Efficiency Scheme²⁰ (REES) in South Australia. We note however that the SA Government has proposed a metric based on a weighted sum of energy savings for the REES.
2. 40% of the schemes that use energy metrics consider only electricity. Several of the multi-fuel schemes have separate targets for each energy type or use tonnes of CO₂-e as a common measure. However, a few multi-fuel schemes use a common target denominated in energy units e.g. in France, Italy, Poland, and the UK.
3. Most schemes set targets in terms of final energy, but some use primary energy. Final energy is more closely related to the energy quantities delivered by energy providers and used by consumers, but primary energy accounts for the different conversion factors achieved in converting primary fuels to final energy sources.

The RAP report concluded that best practice is to:

Set the target in terms of final energy (i.e., the quantities of energy delivered to, and used by, consumers), unless the scheme covers several different fuels, in which case use primary energy. Denominate the target in energy units unless the scheme has a policy objective that relates to GHG emissions reductions, in which case consider using CO₂-e units.

Unfortunately, this conclusion does not adequately address the selection of a metric in circumstances when the electricity from fossil fuel generators is being replaced by electricity from renewable sources, as the concept of ‘primary energy’ fails when considering renewable energy.

Some further insights in the question of the metric are provided by the following table, taken from the recent review of the NSW Energy Savings Scheme²¹. The ESS review noted that:

“If both electricity and natural gas energy savings are to be recognised under a single scheme, there needs to be a factor to value natural gas savings against electricity savings. This conversion factor has implications for the level of financial incentive available for gas efficiency and how activities that involve fuel switching would be treated”.

Table 8 is derived from this ESS review and summarises different conversion metrics that could be used to appropriately value the relative contribution of natural gas and electricity efficiency abatement measures. Some further options are explored in

Table 9.

²⁰ In October 2014, the SA Government proposed that the REES be renamed the Retailer Energy Efficiency Scheme and that obliged retailers be allowed to meet their targets by delivering energy savings to small businesses as well as homes.

²¹ “Energy Efficiency Action Plan Action 1: Review of the Energy Savings Scheme Issues Paper”, NSW Government, 2014

Table 8: Illustrative certificate conversion factors for electricity and natural gas from the ESS review

Conversion metric	Relative weighting of energy types				Energetics' comments
	Unit	Electricity	Natural gas	Ratio	
Retail price	\$ / MWh	238	40	6.0	A target based on combined retail expenditure would directly address EEIS objective (c) – reducing the cost burden on ACT residents. However, establishing an appropriate target will depend upon the accuracy of energy price forecasts. Retail prices also vary by consumer type (e.g. business versus residential, large versus small).
Greenhouse gas emissions	tCO ₂ -e / MWh	1.06	0.24	4.4	This is the current metric. Its shortcomings in the face of falling emissions intensity for grid electricity have already been discussed.
Wholesale price	\$ / MWh	55	16	3.4	A target based on the wholesale energy price will directly address the energy costs experienced by the ACT economy as a whole. Future wholesale prices are uncertain and depend upon a large range of factors acting both within and outside of Australia.
Primary energy consumption	MWh (primary) / MWh (final)	2.8	1.0	2.7	The concept of applying 'primary energy' consumption fails when considering renewable energy as mentioned earlier.
Final energy consumption	NA	1	1	1.0	The RAP report recommends against using final energy for schemes covering multiple energy types.

Table 9: Additional certificate conversion factors for electricity and natural gas

Conversion metric	Unit	Electricity	Natural gas	Energetics' comments
Weighted sum based on price and emissions factor	GJ	1.06	0.37	This is the proposed metric for the REES. The normalisation factor for each fuel is based on the average of the relative purchase cost of each fuel type and the relative greenhouse gas intensity of each fuel type.
NPV of the scheme	\$	NA	NA	<p>A range of issues will need to be addressed when establishing a metric based on NPV:</p> <ul style="list-style-type: none"> • Is it more important to consider the NPV from the perspective of the ACT economy (total resource cost) or the combined NPV of the measures as perceived by the participants (participant cost test)? • Should the NPV target be adjusted if and when the actual energy prices diverge from the energy prices used in the modelling? • Should the discount rate used to calculate the NPV from year to year be adjusted to reflect changes in interest rates? • Should the NPV calculation always use the estimated implementation costs used in the modelling or should it be updated to reflect the experiences of the obligated parties? • What is the best way to communicate to obligated retailers the changes in the required reduction in energy consumption that result from changes in the parameters used to calculate the NPV of the scheme? This is particularly topical now given the concerns about changes in the GWh target for the RET with a move to the 'true 20%' target.

Discussion

The various options for a single metric for a multi-fuel scheme all face difficulties when the renewable content in the electricity mix rises over time.

As the RAP report finds that a metric in energy units is best practice for energy efficiency schemes, we assessed options to address weaknesses of the two energy-based metrics mentioned above.

Several are available:

4. Assign a nominal value for the conversion of final renewable energy to 'primary' renewable energy. This would allow for the use of a single target for the EEIS denominated in energy units. For instance, the nominal value could be set equal to the corresponding value for NSW electricity (currently 2.8 according to Table 8).
5. Consider separate targets for electricity and natural gas, adjustable on a yearly basis as required to maintain rough parity between the cost of achieving the electricity target and the cost of achieving the natural gas target.

Both options rely on the regular updating of a factor presumably via a disallowable instrument. Note that the Minister currently declares the grid emissions factor for the scheme as it currently operates also via a disallowable instrument.

The falling average emissions factor for grid electricity in the ACT will affect the incentive offered to measures that reduce electricity use. However, should there be no actual requirement for the Emissions Factor from the Disallowable Instrument to reflect the actual emissions factor for ACT electricity, it may be simplest to retain the current metric of tonnes CO₂-e and base the calculation of tonnes of CO₂-e on a nominal emissions factor that does not exceed the emissions factor for grid electricity in NSW. We note that this is effectively the approach proposed for the REES, where the weightings used to aggregate electricity and gas savings are derived from an arbitrary averaging of differences in price and differences in the emissions intensities of the fuels.