



**ACT**  
Government

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Environment and  
Sustainable Development

# **Energy Efficiency Improvement Scheme**

Energy Efficiency (Cost of Living) Improvement Bill

## **REGULATORY IMPACT STATEMENT**

Environment and Sustainable Development Directorate

March 2012

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# Executive Summary

## Background

Despite ongoing improvements in energy efficiency, there remains a large potential for additional energy savings across all sectors of the economy. These opportunities will persist under a national carbon pricing scheme, due to a wide range of inherent market failures, and will not be realised without additional Government intervention.

The ACT Government, through the *National Partnership Agreement on Energy Efficiency*, has committed to the development of a nationally consistent and coordinated package of measures to advance energy efficiency outcomes across the Territory economy. In addition to these measures, a number of jurisdictions (NSW, VIC and SA) have also developed retailer (supplier) obligation energy efficiency schemes. These have been demonstrated to be highly cost effective in reducing greenhouse gas emissions and consistently deliver net economic benefits.

In 2010, the Prime Minister's Task Group on Energy Efficiency recommended the development of a national energy savings initiative to replace existing state-based supplier obligation schemes. Whilst general support for the development of a national energy efficiency scheme was voiced in the Federal Government's recently released Clean Energy Future package, no specific timelines for the development and implementation of such a scheme have been announced. The ACT has a strong interest in the development of a more seamless national market for energy suppliers and will work closely with other jurisdictions on the development of a national framework for a supplier funded energy efficiency obligation scheme operation through the COAG Select Council on Climate Change.

## Preferred scheme model and scope

A non-certificate based supplier obligation energy efficiency scheme (the Scheme), based on South Australia's Residential Energy Efficiency Scheme (REES) is proposed to commence in the ACT from 1 January 2013 to 31 December 2015.

The Scheme will commence with coverage of the ACT residential and small and medium-sized enterprise (SME) sector. It will be established through the *Energy Efficiency (Cost of Living) Bill 2012*.

It is clear that, in the absence of any statutory requirement, industry will not supply such a scheme and, in particular, will not act to the benefit of low-income households. Creation of a statutory obligation provides a basis on which reasonable costs can be incurred in the expectation that those costs may be equitably recovered by industry participants.

## Scheme costs and benefits

The Environment and Sustainable Development Directorate (ESDD) has undertaken comprehensive modelling of the scope of energy savings potential in the ACT residential sector. This analysis concludes that an optimal balance of greenhouse gas abatement and cost-savings objectives results in total life-cycle greenhouse gas savings of around 742 kt CO<sub>2</sub>. This constitutes a reduction on residential sector emissions of about 6.2 per cent from business as usual in 2015 and 4.7 per cent in 2020.

The Scheme will also have net present value (NPV) of around \$40 million. While not a large amount in the context of the overall Territory economy, this demonstrates a clear net economic benefit. Financial costs and benefits are further detailed in the tables below. Total lifetime bill savings generated by the Scheme are estimated at \$358 million, or around \$2,227 per household.<sup>1</sup>

Further modelling will be undertaken in 2012 to assess the impact of including the small and medium-sized enterprise sector under the Scheme, based on developments under the Victorian Energy Efficiency Target (VEET) Scheme.

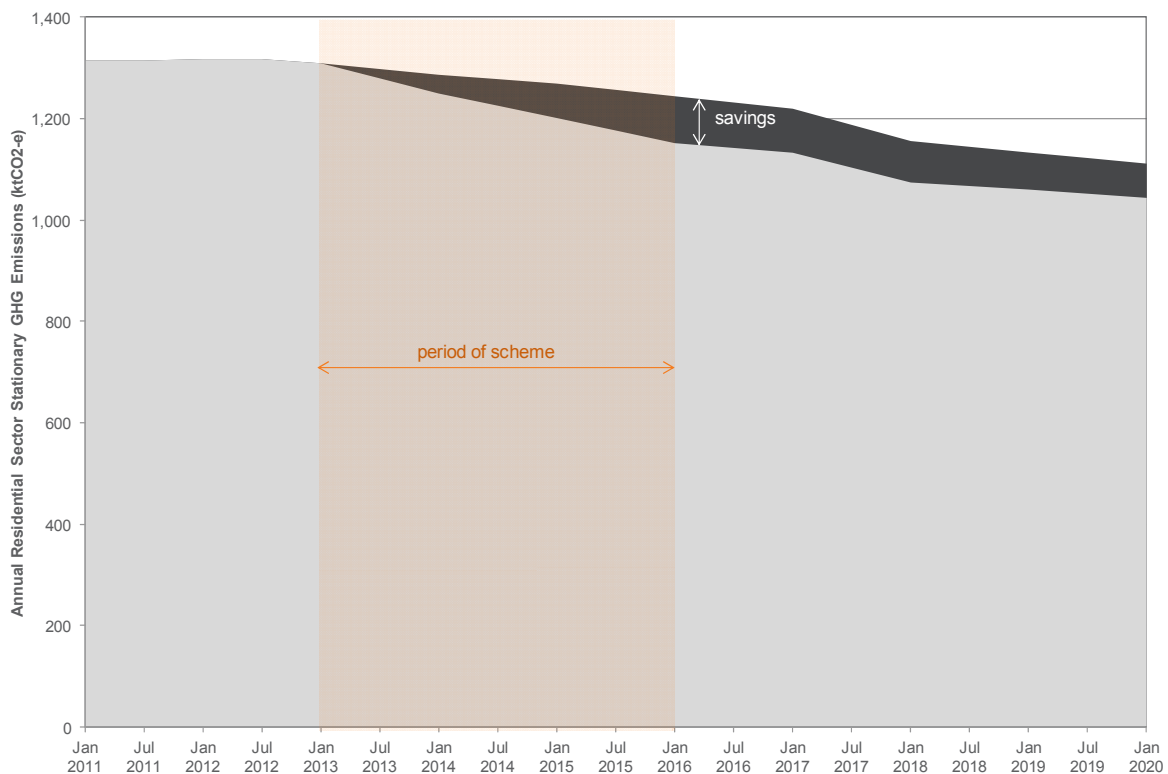
**ES Table 1: Nominal price impact on energy bills per ACT household**

Scheme period	Pass-through cost impacts	Average annual bill savings <sup>1</sup>
Period 1: 1 January 2013 to 31 December 2013	\$19	\$66
Period 2: 1 January 2014 to 31 December 2014	\$35	\$135
Period 3: 1 January 2015 to 31 December 2015	\$233	\$191
<b>Total*</b>	<b>\$87</b>	<b>\$392</b>

*\* It is important to note that while costs to households will discontinue with the end of the Scheme, bill savings will continue beyond this period. Total lifetime savings are estimated at \$2,227 not discounted for inflation.*

The impact of the scheme on ACT greenhouse gas emissions is shown below. Continuation of the Scheme beyond 2015 would result in substantial further reductions.

**ES Figure 1: Scheme impact on ACT greenhouse gas emissions**



<sup>1</sup> These figures are 'nominal' and not discounted for inflation of costs of capital.

### Electricity retail market competition and Energy Savings Contribution fees

The Scheme has been designed to minimise the impact on electricity suppliers, especially smaller suppliers and new market entrants. This is consistent with the ACT Government's objective of supporting enhanced retail competition in the Territory.

Tier 2 suppliers (electricity suppliers with less than 500,000MWh sales per annum) will be allowed to either participate in the Scheme, or discharge their obligations through the payment of an Energy Savings Contribution fee equal to the estimated marginal cost of participation of the Tier 1 supplier (ActewAGL Retail). Scheme legislation establishes a fund to collect contribution fees and require that all funds be spent in a manner consistent with the Objects of the legislation. This fund will also be used to pay for Scheme administration.

An adjustment to the Transition Franchise Tariff rate will be made from 1 January 2013 equal to the expected cost to the Tier 1 supplier of complying with the Scheme. It is expected that all suppliers will adjust their market contract rates to an equal extent to recover their costs. Future reviews of regulated electricity pricing will include an assessment of *ex-post* costs to ActewAGL and this may flow through to an equalisation of the Energy Savings Contribution rate for Tier 2 Suppliers. Overall it has been determined that this approach will provide a sufficient ongoing incentive to both ActewAGL and Tier 2 suppliers to reduce their costs of compliance.

Total funds of approximately \$4.8 million are expected to be raised over the initial 3.5 year term of the Scheme compared to total administration costs of around \$1.8 million. Remaining funds can be, for example, used to further stimulate the uptake of energy savings activities (such as through rebates or subsidies), or invested in innovative large-scale energy efficiency demonstration projects. The collection of funds results from the simplified Energy Savings Contribution regime offered to Tier 2 suppliers.

The Administrator must have audited, each financial year, the accounts of the energy efficiency fund.

### Priority household target (PHT)

Low-income households will be net beneficiaries of the proposed Scheme as Tier 1 suppliers will be obliged to deliver a specified proportion of energy savings products and services to them. Suppliers may need to offer additional incentives to priority households to the extent required to ensure their participation under the Scheme. This may include subsidised or free products and services, or innovative financing packages such as the ability to repay the cost of services through energy bills. The experience of the REES scheme is that targets set for engaging low-income households have been significantly exceeded.

An initial PHT of 25 per cent is proposed for the first Scheme period, and PHTs for subsequent periods will be reviewed, with a view to broadening the definition of priority households to capture a wide range of low-income and otherwise disadvantaged households in the community.

### Included measures

A comprehensive package of residential measures has been included, derived from the Victorian VEET scheme, and adapted to fit the ACT in relation to factors including climatic conditions and current and forecast differences in the emission intensity of our electricity supplies.

Energy efficiency measures included under the Scheme will also be extended to the small and medium-sized enterprises, based on recent developments under the VEET Scheme and in other jurisdictions, following a further Regulatory Impact Assessment.

### Administration and review

The Scheme will require an Administrator to establish the operation of the Scheme, monitor the compliance of suppliers with the Scheme's obligations and report to the Minister on Scheme operation. Further, the Administrator may establish Codes and Guidelines in relation to health, safety and environment matters. The Administrator will be a person appointed by the Minister.

The Minister must commence a review of the Act in January 2014, including consideration of the operation of the Act after 2015, and any change required to improve the Act and the impact of national law and policy, in relation to energy efficiency, on the Act.

# The Problem

## The problem and its magnitude

Climate change is the most significant environmental, social and economic challenge of our time. In the ACT, we can expect the long-term impacts of climate change to include increased susceptibility to extreme weather events, higher temperatures, reduced rainfall and drier conditions.

The ACT Government recognises the connection between greenhouse gas (GHG) emissions and climate impacts, and thus the importance of reducing the ACT's GHG emissions in a timely manner.

In November 2010, the ACT Legislative Assembly enacted the *Climate Change and Greenhouse Gas Reduction Act 2010* that has a primary target of zero net emission by 2060 and an interim target of a 40 per cent reduction in greenhouse gas emissions from 1990 levels by 2020.

The ACT Government acknowledges that success in achieving these targets depends on action by everyone; government, business, community groups, households and individuals. We will need to be smarter in how we use energy and the energy we use must be cleaner. Our choices will involve investment in more sustainable energy use, adoption of new technologies and changes in lifestyle. We will need to ensure that our choices do not increase social inequities within our community and that we implement cost-effective and efficient solutions.

Access to abundant and diverse high quality energy resources in Australia means our industrial and residential electricity and gas prices are close to the lowest in the developed world<sup>2</sup>. Further to this, prices in the ACT are acknowledged as being some of the lowest in the country. This, it is widely accepted, has led to the inefficient use of energy in households, business and industry. We are currently highly dependent on the delivery of reliable, low-cost energy in order to maintain our lifestyle – with the ACT one of the highest per capita energy users in Australia, as shown in Figure 1. As Figure 2 shows, the ACT also has the highest per capita non-residential sector energy use.

The amount of energy used in the ACT is important for a number of reasons. The ACT as part of a broader Australian economy is, and will continue to be, dependent for some time to come on non-renewable fossil fuel sources such as coal, natural gas and petroleum. Over 90 per cent of the current national electricity generation depends on non-renewable fossil fuel sources, with coal representing 76 per cent and natural gas 16 per cent.<sup>3</sup> Australia's per capita greenhouse gas emissions are the highest of any OECD country and are among the highest in the world. Australia's per capita emissions are nearly twice the OECD average and more than four times the world average<sup>4</sup>. While we will continue to rely on fossil fuel-based energy in the short to medium term, that dependence needs to be reduced as quickly as possible if we are to reduce our GHG emissions.

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<sup>2</sup> MCE Final report on the Council of Australian Governments' Independent Review of Energy Market Directions, 2002, *Towards a Truly National and Efficient Energy Market*

<sup>3</sup> ABARE, 2010, *Energy in Australia*

<sup>4</sup> Garnaut, R, 2008, *Garnaut Climate Change Review*, Cambridge University Press

Figure 1: Residential sector energy use (not including firewood)<sup>5</sup>

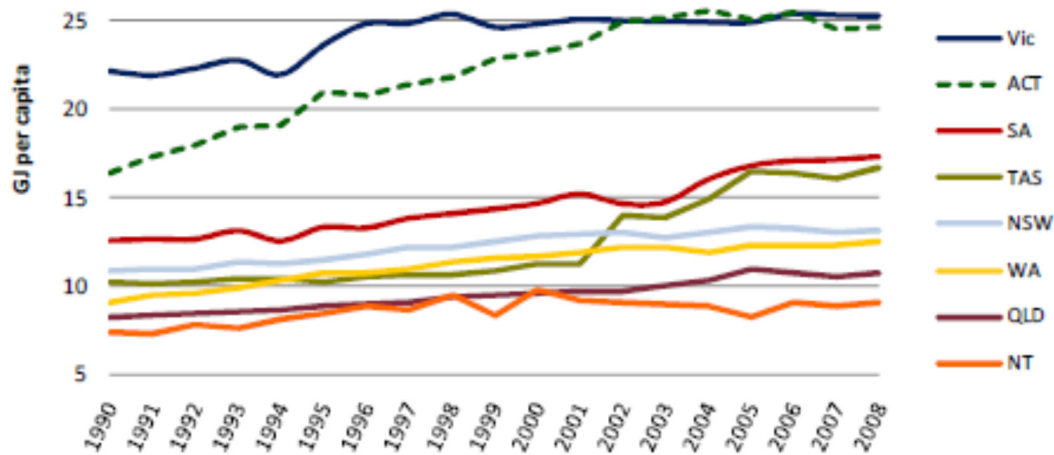
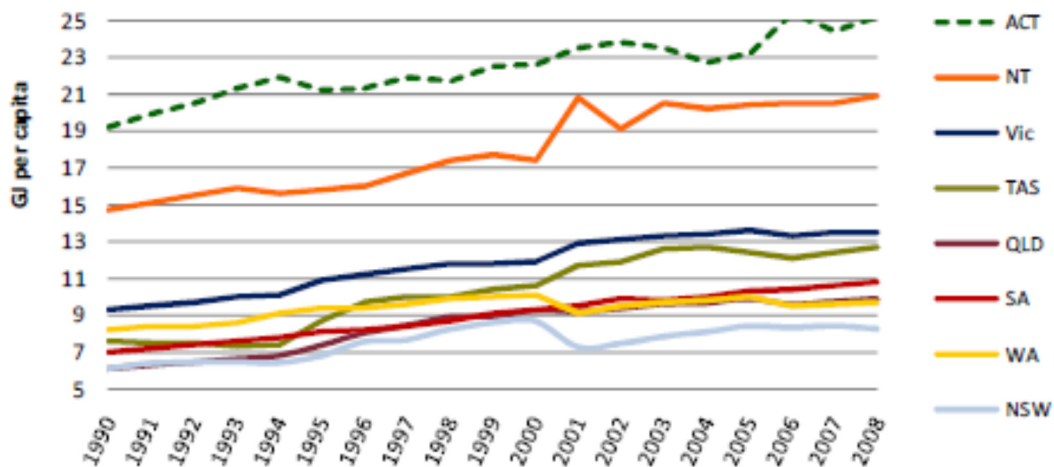


Figure 2: Non-residential sector energy use

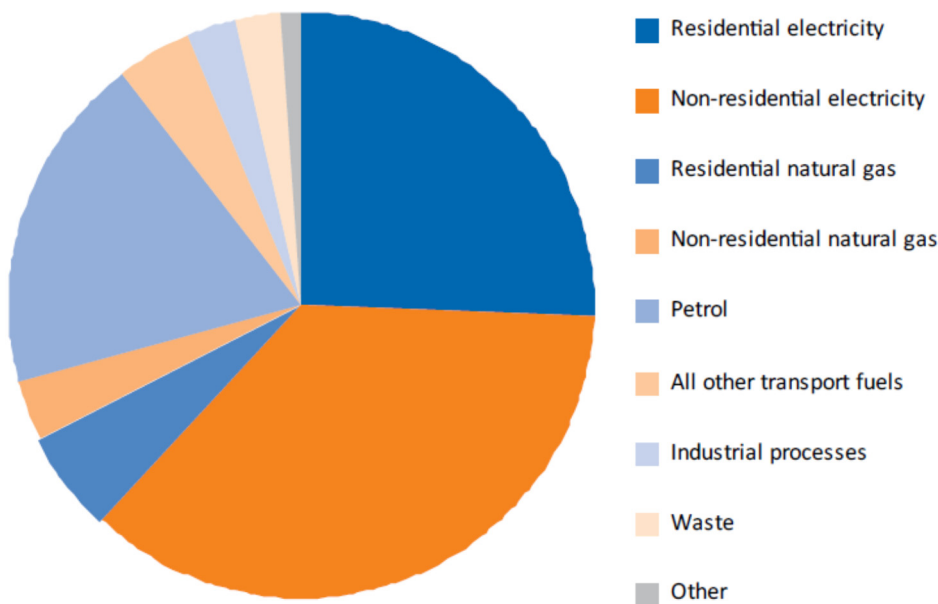


The use of stationary energy sources in particular, significantly contributes to the overall GHG emissions profile for the ACT. In 2008, the ACT produced 4.18 million tonnes of greenhouse gas emissions. As shown in Figure 3, residential and non-residential electricity use accounted for 25 and 37 per cent respectively. Residential and non-residential natural gas consumption accounted for around 5 and 3 per cent respectively. Only 6 per cent of emissions came from non-energy-related sources such as industrial processes and waste.

<sup>5</sup> ACT Government, 2010, *ACT Greenhouse Gas Inventory 2008*  
[http://www.environment.act.gov.au/\\_data/assets/pdf\\_file/0015/200175/ACT\\_Greenhouse\\_Gas\\_Inventory\\_2008.pdf](http://www.environment.act.gov.au/_data/assets/pdf_file/0015/200175/ACT_Greenhouse_Gas_Inventory_2008.pdf)



**Figure 3: The ACT’s sources of greenhouse gas emissions**



Further, the ACT has no significant domestic electricity generation and imports all natural gas and transport fuels, the exceptions being some generation from mini-hydro, landfill methane gas and small-scale solar, which combined generate less than one per cent of electricity used in the Territory. The remainder of our electricity is sourced from the National Electricity Market from generators in other states.

### Rising energy prices

Our inefficient use of energy creates a risk for the community when faced with likely future higher energy prices.

The national electricity market will absorb high levels of investment in generation and network infrastructure over the coming decade. Much of this investment relates to demand for gas generation plants required to meet ever higher peak loads resulting, to a large extent, from the increasing use of air conditioning on hot days. These costs will be amortised across all users in the national electricity market and will result in higher electricity prices for ACT households and businesses.

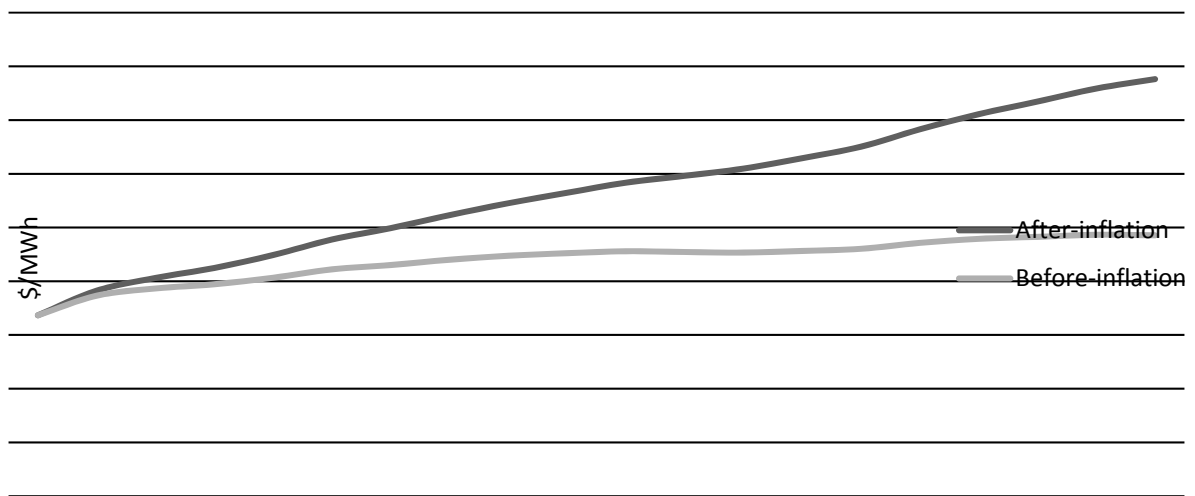
The need to move to a higher-cost, low carbon economy and renewable energy sources will also have an impact on energy prices. These costs are primarily manifest in scheme costs passed through to energy users, such as the Commonwealth’s Renewable Energy Target Scheme and the ACT feed-in tariffs. Figure 4 presents a mid-range scenario for electricity prices in both nominal and real (discounted for inflation) terms.

In addition to reducing household and business electricity costs, improving energy efficiency can also reduce the need for generation and network infrastructure investment and therefore lower wholesale prices and network charges. This has been a significant justification for the development of the NSW Energy Savings Scheme and the proposed expansion of the Victorian Energy Efficiency

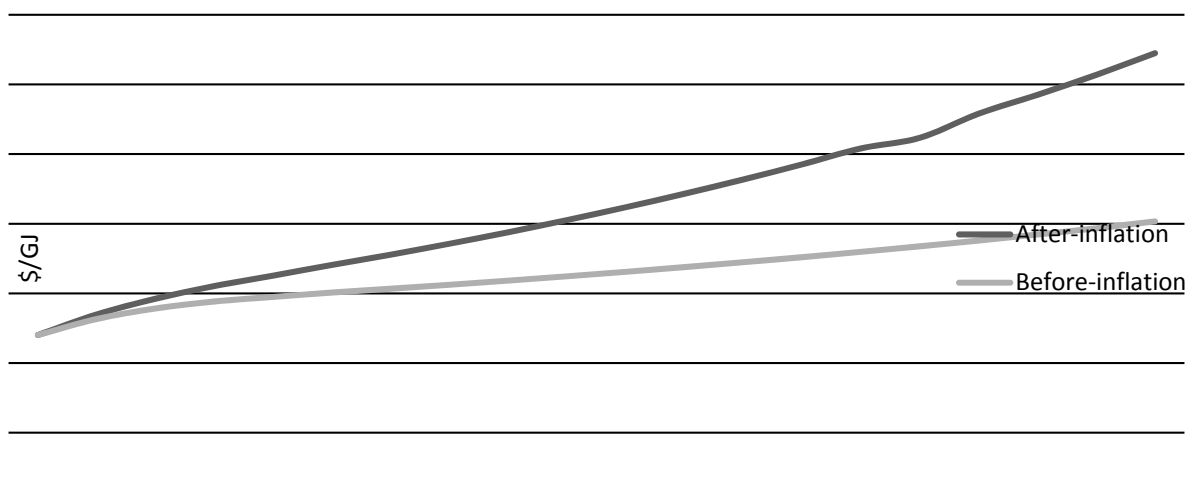
Target Scheme. While it is difficult, due to our small size, to model the impact of reduced ACT energy consumption on required investment in the national electricity market, reduced wholesale prices and network charges would be associated with the impact of reduced electricity consumption in the ACT.

Natural gas price rises in Australia’s Eastern states are also expected to increase markedly over the coming decade. This is a result of increased demand as well as the development of Compressed National Gas export facilities, which will move wholesale natural gas pricing closer to the relatively high international export contract prices. Figure 5 presents a mid-range scenario for natural gas prices in both nominal and real (discounted for inflation) terms.

**Figure 4: Mid-range ACT small customer electricity prices, 2011-12 to 2030-31**



**Figure 5: Mid-range ACT small customer natural gas charges 2011-12 to 2030-31**



As the price of energy continues to rise, the impact of inefficient energy use in low-income households also becomes an increasingly important issue. Low-income households spend a much greater proportion of their budget – nearly double – on energy than wealthier households<sup>6</sup>. The opportunity for these households to invest in energy efficiency measures is also reduced, compounding the issue. Given that energy is an essential service, when the prices of these services increase, householders are left with little option but to pay the extra cost.

A significant imperative therefore exists to address the efficiency of energy use in the ACT, as improving energy efficiency will reduce the impact of price increases on households, contribute to GHG emissions reductions in the ACT and enhance social equity.

Analysis undertaken to support the ACT Government's Climate Change Strategy *Weathering the Change Action Plan 2* demonstrates that energy efficiency is the most cost-effective way for the Territory to reduce greenhouse gas emissions. Increasing energy efficiency will therefore reduce costs to the ACT community in meeting our legislated greenhouse gas reduction targets.

## Nature of the market barriers

The ACT Government continues to advocate for a national price on carbon as an economically efficient way of reducing national emissions and the emissions intensity of electricity supplied to the ACT through the national electricity market. The ACT will, however, require additional complementary measures to reduce our emissions in line with our own emissions reduction objectives and mitigate some of the impacts of a carbon price on our community.

The ACT, through the Council of Australian Governments (COAG), has agreed to a set of principles to guide assessment of emission reduction measures and determine whether the measures complement emissions trading. These principles include the need for measures to be targeted at a market failure that is not expected to be adequately addressed by pricing carbon, including where the price signals of the carbon price are insufficient to overcome other market failures that prevent the take-up of otherwise cost-effective abatement measures. Complementary measures may also be targeted to manage the impacts of the carbon price on particular sectors of the economy.

There is a range of market failures and barriers which prevent optimal uptake of cost-effective energy efficiency, even under a national system for pricing carbon. These barriers have been extensively discussed by other jurisdictions in Australia, as well as overseas, in the development of their energy efficiency schemes. Notably, the Victorian Energy Efficiency Target (VEET) Regulatory Impact Statement (RIS) discusses the details of these failures, with these also relevant to the situation in the ACT. They are discussed below.

### Bounded rationality and organisational failures

Even with access to information, individuals and organisations can fail to recall, process or use information effectively.<sup>7</sup> While markets rely on individuals to make rational decisions, in practice, perfectly rational decisions are often not made. The concept of bounded rationality states that this is

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<sup>6</sup> ACOSS, 2009, *Energy and Equity* [http://acoss.org.au/images/uploads/4204\\_EnergyEquity\\_low\\_res.pdf](http://acoss.org.au/images/uploads/4204_EnergyEquity_low_res.pdf)

<sup>7</sup> Energy Efficiency Council, 2009

due to the finite computational resources available for making decisions. That is, suboptimal outcomes may be achieved through markets as individuals have a limited ability to process and analyse information and hence make decisions that can satisfy but may not necessarily maximise their utility.

Due to the complexity associated with assessing the relative benefits of purchasing an energy efficient product that has lower operating costs but higher upfront capital costs, the uptake of energy efficient products is highly impacted by the problem of bounded rationality. Even when it is rational to do so, householders and businesses do not purchase energy efficient products, due to the complexity and time involved in making a well-informed decision.

The VEET RIS identifies two symptoms of bounded rationality concerning the uptake of energy efficient products. These are consumers' beliefs on discount rates for energy efficient products and the high price inelasticity of demand for energy.

### Discount rates

Market behaviour studies show that consumers often place greater emphasis on upfront purchase cost than whole-of-life costs. This is particularly inhibitive of the uptake of energy efficiency measures in households as the savings on energy bills made over the life of an energy efficient appliance may be discounted more than the upfront savings associated with selecting a less energy efficient appliance<sup>8</sup>.

Compounding this issue is the fact that, for many households and businesses, energy is not yet a significant budget consideration. While low-cost energy in the ACT is not a market failure, it offers some explanation for low uptake of energy efficiency products.

Discount rates reflect the time value of money. As the discount rate is increased, the present value of a future stream of costs over benefits is going to become smaller. High discount rates favour projects with short-term payoffs over projects with long-term benefits. Estimated implicit discount rates for energy efficiency investments presented in several studies range from 25 per cent to 300 per cent across a range of measures<sup>9</sup>.

One study of consumer purchases of air conditioners found that consumers could achieve considerable present-value savings by switching to more energy-efficient alternatives. Figure 6 demonstrates the finding that implicit discount rates fell sharply in high income households, whilst low-income households showed discount rates of up to 89 per cent<sup>10</sup>.

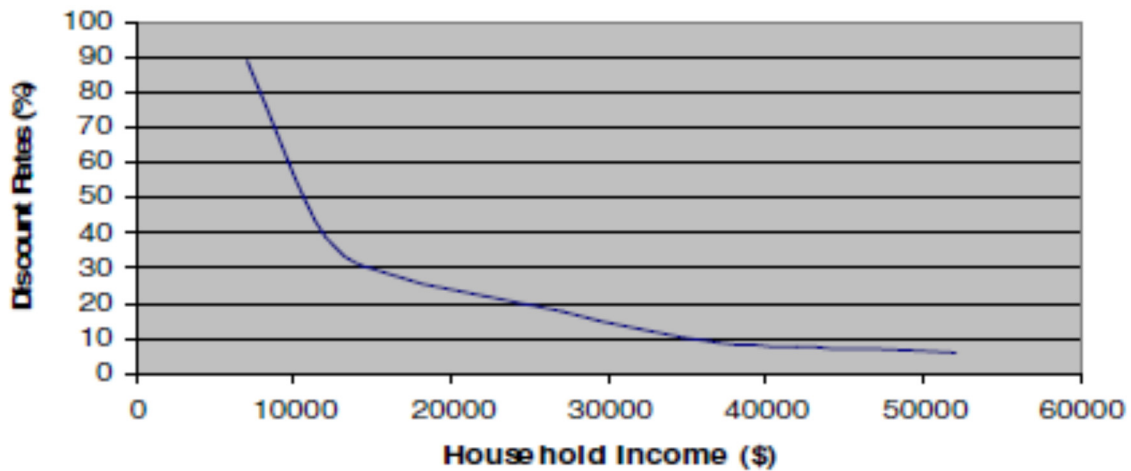
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<sup>8</sup> Garnaut, R, 2008, *Garnaut Climate Change Review*, Cambridge University Press P408

<sup>9</sup> Gillingham, K, Newell, RG & Palmer, K, 2009, *Energy Efficiency Economics and Policy*, Resources for the Future

<sup>10</sup> Hausman, J.A, 1979, *Individual Discount Rates and the Purchase and Utilisation of Energy-Using Durables*. Bell Journal of Economics, p10, cited in Department of Primary Industries Victoria, 2008, Proposed Victorian Energy Efficiency Target Regulations Regulatory Impact Statement.

**Figure 6: Example of implicit discount rates in energy efficiency purchases as a function of household income in the United States<sup>11</sup>**



Price elasticity of demand

Low price elasticity of demand also exists in relation to energy efficiency as a result of bounded rationality. The National Institute of Economic and Industry Research (NIEIR) has established a household electricity demand elasticity of - 0.25 based on historical Australian data<sup>12</sup>. The implication of this is that for a one per cent increase in electricity prices, the corresponding reduction in demand is only 0.25 per cent. The study further identifies that commercial enterprises are likely to be more responsive to a change in price than residential energy users. The Australian Energy Market Operator’s latest estimates of own price elasticity for each region show a particular inelasticity in the New South Wales region, of which the ACT is a part (Table 1).

Many of the highest energy-consuming appliances provide consumers with an essential service (hot water, heating, refrigeration, etc). Consumers generally do not replace such items until they fail, and when they do fail a consumer’s first priority can be replacing the item in question as quickly as possible – with other considerations, no matter how economically rational, secondary. As a result, the essential service characteristic of many appliances significantly constrains a consumer’s capacity to weigh up other information regarding an appliance. These factors mean that changes in the price of electricity – including those induced by carbon pricing – will have an extremely limited impact on energy consumption, particularly for low-income households.

The Garnaut Climate Change Review identifies two factors that may constrain a low-income household’s response. First, low-income households are less able to fund the higher upfront cost of energy-efficient technologies. Second, a large proportion of low-income households live in rental,

<sup>11</sup> Ibid.

<sup>12</sup> National Institute of Economic and Industry Research, 2007, *The Own Price Elasticity of Demand for Electricity in NEM Regions: A report for the National Electricity Market Management Company (NEMMCo)*, cited in Fear, J & Denniss, R, 2009, *Zero-sum game? The human dimensions of emissions trading*, The Australia Institute

public or community housing and therefore have limited incentive to pay for permanent energy-saving activities associated with a house such as insulation, space heating and hot-water systems.<sup>13</sup>

**Table 1: Long-run price elasticity estimates<sup>14</sup>**

Region	Own Price Elasticity
<b>New South Wales</b>	-0.16
<b>Tasmania</b>	-0.23
<b>South Australia</b>	-0.25
<b>Queensland</b>	-0.29
<b>Victoria</b>	-0.38

### Public good information, information spill-overs and information asymmetry

Many homeowners, companies and specialists lack understanding of energy efficiency due to a range of information failures. Information asymmetry, where one party in a transaction has more or superior information compared to another, can impede coordination between parties. An example of this is third party assessment of energy efficiency ratings used to disclose the energy performance of homes to potential buyers.

In spite of considerable investment by governments and other parties in explaining the benefits of energy efficiency, householders' understanding of the benefits of energy efficiency remains limited. In its submission to the Garnaut Review, the Productivity Commission indicated that one of the main justifications for a supplementary policy to an emissions trading scheme in Australia is to correct an information failure<sup>15</sup>.

There is a considerable amount of information available to the general public on energy efficiency. However, this information is only as useful as its capacity to inform consumers and influence their decision making. The VEET RIS identified a number of reasons why much of the information available regarding energy efficiency does not necessarily enable informed decision making. These include time lags, aggregated energy pricing and transaction/search costs.

#### *Time lag between energy consumption and receipt and payment of energy bills*

Information about electricity and gas use is commonly received by consumers at a much later time to when these resources were used. This time lag may affect the ability of price information to influence consumer awareness and energy use behaviour. As stated in the Productivity

<sup>13</sup> Garnaut, R, 2008, *Garnaut Climate Change Review*, Cambridge University Press, p389

<sup>14</sup> AEMO, 2011, *Energy and Demand Projections*

<sup>15</sup> Productivity Commission Submission to the Garnaut Climate Change Review, 2008, *What Role for Policies to Supplement an Emissions Trading Scheme?*, p 14

Commission's report, *The Private Cost Effectiveness of Improving Energy Efficiency*, "most consumers act as if they have no control over their electricity bill, [and with the limited feedback they receive] it is often too late for them to respond."<sup>16</sup>

While bills in the ACT provide the information required for a consumer to benchmark their energy consumption and energy expenditure against previous quarters, some consumers may not make such a comparison. Further, although time-of-use information on energy use can be seen on electricity and gas meters, very few householders can be expected to have the motivation or expertise to interpret the information available.

### Aggregated energy prices

A further issue is that electricity and gas bills can only show the cost of operating a diverse range of appliances and equipment over a period of time. As a result, a householder's understanding of individual appliance use and its impact on energy bills may be limited and consumers are not necessarily aware of which particular appliance or equipment is contributing to the total price they ultimately pay for electricity or gas in a given period. This decreases the likelihood of an informed demand response. The VEET RIS compares the situation of electricity and gas to petrol – with petrol used exclusively by the vehicle into which the consumer physically places it.

### Principal-agent problems

Also called misplaced or split-incentive problems, principal-agent problems refer to the frequent misalignment of incentives and goals facing landlords, tenants and building managers, resulting in sub-optimal outcomes<sup>17</sup>.

In relation to energy efficiency, principal-agent problems occur when the economic benefits of energy conservation do not accrue to the person who is trying to conserve energy. This is often the case in the rental market. Fixed household appliances (such as water and space heating) are generally the most expensive and most energy-intensive, but are provided by the landlord – who is primarily concerned about the upfront capital cost, not the ongoing running costs which are incurred by the tenant.

The nature of the split incentives problem is compounded by the price differential that can exist between energy efficient and standard products, low vacancy rates, the number of factors a tenant must consider when evaluating options, and the short average length of tenancies relative to energy payback periods.

### Externalities

GHG emissions resulting from energy production impose costs on third parties not currently borne by energy consumers. As a result there is no incentive for consumers to reduce consumption to a socially optimal level. The 'hidden costs' of electricity (including the costs associated with GHG

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<sup>16</sup>Productivity Commission, *The Private Cost Effectiveness of Improving Energy Efficiency*, 2005, p105

<sup>17</sup> International Energy Agency, 2007, *Mind the Gap – Quantifying Principal-Agent Problems in Energy Efficiency*, p. 11

emissions associated with currently deployed fossil fuel generation technologies) have estimates ranging from \$18/MWh for gas to \$39/MWh for brown coal<sup>18</sup>.

In addition to the negative carbon externality, energy efficiency has spill-over benefits such as reduced network infrastructure costs. For example, the need for investment in additional energy generation, and augmentation of transmission and distribution networks associated with expanded supply, may be reduced by energy efficiency improvements resulting in lower prices for energy, which are shared by the community.

#### Early mover spill-overs

Support for research and development is required to extend the potential of energy efficiency. Currently, 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. Later movers will then share in the associated benefits that spill over directly from the early movers' investments – thus resulting in a strong disincentive for early innovation<sup>19</sup>.

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<sup>18</sup> The Australian Academy of Technological Sciences and Engineering (ATSE), 2009, *The Hidden Costs of Electricity: Externalities of Power Generation in Australia*, p.2.

<sup>19</sup> Garnaut, R, 2008, The Garnaut Climate Change Review: Final Report, <http://www.garnautreview.org.au/chp18.htm>



## Consultation

Following the development of a consultation paper regarding a supplier obligation energy efficiency scheme for the ACT (the Scheme), targeted consultation was carried out with a number of industry, community and government stakeholders. During the consultation process the Environment and Sustainable Development Directorate sought formal written response to the circulated consultation paper. Further to this, a number of meetings and conversations were held. This RIS, and the recommended energy efficiency scheme, have been prepared in line with the comments received through this process.

The consultation demonstrated strong support for the Scheme from some electricity suppliers and social welfare organisations. Key issues identified through the consultation process included:

- The appropriateness of an ACT energy efficiency scheme in light of the potential for a national scheme in the future.
- The potential negative impact on competition as a result of a proposed 'participation threshold' for electricity suppliers.
- The potential negative impact on electricity retail market competition as a result of the proposed differentiated obligation on competitors.
- The price of shortfall penalties.
- What to do with funds raised by the Scheme.
- The ability for second tier suppliers to pass-through costs.
- The inclusion of a household audit target under the Scheme.
- Which households are included under the priority household (low-income) category.
- The potential role of the Independent Competition and Regulatory Commission (ICRC) as the Scheme Administrator.
- The interaction of the Scheme with existing energy efficiency programs in the ACT.
- The interaction of the Scheme with the new National Energy Customer Framework.
- The need for sufficient lead time for the proposed implementation timeline.

## Objective

In consideration of the outlined problem and underlying causes relating to inefficient use of energy in the ACT, the principal objectives of a Government response are to:

- encourage the efficient use of electricity and gas;
- reduce greenhouse gas emissions associated with stationary energy use in the Territory;
- reduce household and business energy costs; and
- increase opportunities for vulnerable households (for example, low-income households, pension concession holders, etc.) to lower energy use and costs.

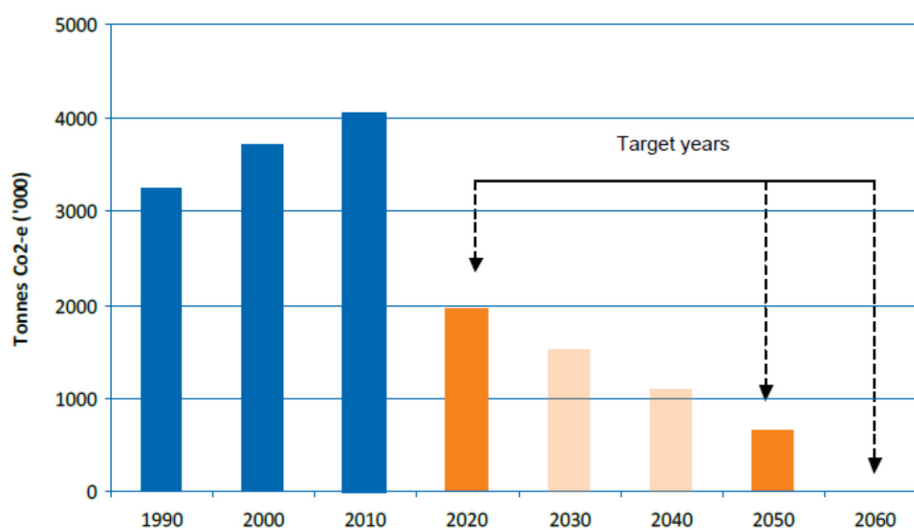
## Relevant government policy

In 2010, the ACT Legislative Assembly passed the *Climate Change and Greenhouse Gas Reduction Act 2010* introducing some of the most ambitious greenhouse gas reductions targets in the world. The principal target of the legislation is to achieve zero net emissions (carbon neutrality) by 2060. The following interim targets are also set:

- per capita emissions to peak by 2013
- emissions reduced by 40 per cent from 1990 levels by 2020
- emissions reduced by 80 per cent from 1990 levels by 2050

Figure 7 illustrates the challenge of achieving our emissions reduction target relative to historical emissions trends. The 2020 target is equivalent to an estimated 52% reduction from 2010 levels. The period to 2020 therefore represents the major turnaround in the Territory's emissions trajectory.

**Figure 7: The ACT's emission reduction targets**



To become carbon neutral in 2060 these commitments will require the Territory to reduce its greenhouse gas emissions to the maximum extent possible and offset any residual emissions by undertaking or investing in accredited carbon offset projects.

The Chief Minister, in announcing the Government's legislation program on 16 August 2011, referred to legislation that would "impose an obligation on ACT electricity suppliers to undertake prescribed energy efficiency and related measures"<sup>20</sup>.

A further important contextual consideration of action on GHG abatement in the ACT is the Commonwealth Government's *Clean Energy Future* package. Under the package, a price will be placed on greenhouse gas emissions in a national market, thus providing emitters with an incentive to reduce their emissions where this is the cheapest option, while also allowing the continuation of emissions where they are most costly to reduce.

The ACT is working with other jurisdictions across a broad range of areas to achieve national coordination in emissions reductions and energy policy initiatives. The ACT Government, through the National Partnership Agreement on Energy Efficiency, has committed to the development of a nationally consistent and coordinated package of measures to advance energy efficiency outcomes across the Territory's economy.

In addition to these measures, a number of jurisdictions have implemented supplier obligation energy efficiency schemes. These Schemes impose a legislated requirement on electricity and/or gas suppliers to achieve specified annual energy savings targets. These targets are met through the implementation of energy savings measures in households and/or businesses or through the purchase and surrender of certificates generated by third party energy efficiency service providers.

In 2010, the Prime Minister's Task Group on Energy Efficiency<sup>21</sup> recommended the development of a national energy savings initiative to replace existing state-based supplier obligation schemes. The Task Group reported that an energy savings initiative would form the final piece of a comprehensive framework of market-based instruments, in addition to a carbon-pricing scheme and national renewable energy targets, that work together to provide incentives for all Australians — households, businesses and industry — to contribute to reducing Australia's greenhouse gas emissions. Whilst general support for the development of a national energy efficiency scheme was recently voiced in the *Clean Energy Future* package, no specific timelines for the development and implementation of such a scheme have been announced.

ESDD's analysis of the current political situation suggests that the greenhouse gas reduction targets set by the ACT Government mean efficiency targets or schemes developed at a national level are unlikely to be ambitious enough to meet the ACT's needs. Further, the ACT must act promptly on efficiency measures in order to achieve the greenhouse gas reduction targets in a timely and cost-effective manner. The ACT does, however, have a strong interest in the development of a seamless national market for energy suppliers and will work closely with other jurisdictions on the development of a national framework for a supplier funded energy efficiency obligation scheme through the COAG Select Council on Climate Change.

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<sup>20</sup> <http://www.hansard.act.gov.au/hansard/2011/pdfs/P110816.pdf>

<sup>21</sup> Prime Minister's Task Group on Energy Efficiency, *Report of the Prime Minister's Task Group on Energy Efficiency*, 2010 <http://www.climatechange.gov.au/government/submissions/pm-task-group.aspx>

## Options

International studies show that despite ongoing improvements in energy efficiency, there remains a large potential for additional energy savings across all sectors of the economy. Energy efficiency measures often have a short pay-back period on their initial cost. Many studies have also shown that energy efficiency is the most cost-effective way of abating greenhouse gas emissions in Australia.

The policy measures available to address energy efficiency tend to only partially address the market failures in respect of the optimal uptake of energy efficiency opportunities by households and Small to Medium Enterprises (SMEs), as summarised below in Table 2.

**Table 2: Policy instruments matched against market failures**

Policy	Lack of information	Split incentives	Negative externality
<b>Rebates</b>	Partially addresses	Partially addresses	Partially addresses
<b>Energy performance standards</b>	Partially addresses	Partially addresses	Partially addresses
<b>Education and information campaigns</b>	Partially addresses	<i>Does not address</i>	<i>Does not address</i>
<b>Bill benchmarking</b>	Partially addresses	<i>Does not address</i>	Partially addresses
<b>Carbon pricing</b>	<i>Does not address</i>	<i>Does not address</i>	Partially addresses

It is expected that each measure – either in isolation or in conjunction with other existing measures – will not be sufficient to address the outlined market failures within a timeframe that is sufficient to satisfy the Government’s policy objectives. The measures most relevant to households and SMEs in the ACT are discussed below.

### Rebates

Aimed primarily at households, a number of rebates for energy efficiency improvements exist in the ACT.

Current and recent examples include:

- *ACTSmart* - the one-stop-shop for information on ACT Government rebates and assistance to help ACT residents save energy and water, reduce waste and cut greenhouse gas emissions.
- *HEAT (Home Energy Advice Team) Energy Audits and Rebates* – the HEAT Energy Audit is a home energy audit delivered by the Home Energy Advice Team for houses and semi-detached houses in the ACT that were built before 1996. The ACT Government also provides a rebate of up to \$500 when the applicant addresses the priority recommendations in the HEAT Energy Audit report.

- *Outreach* – a program that provides assistance to low-income households in the ACT to reduce their energy and water bills through home energy assessments, education, appliance replacement and retrofits.

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.

Rebate programs can be costly to administer and take-up rates can vary. A 2011 Grattan Institute report<sup>22</sup> that analysed the range of policies implemented in Australia to reduce emissions, found rebates to be highly cost-ineffective compared to other options – with most schemes costing government more than \$200 per tonne of CO<sub>2</sub>-e abatement, excluding co-funding of initiatives 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.

## 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 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 a 6 star energy rating under the Nationwide House Energy Rating Scheme.

MEPS 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.

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<sup>22</sup> Daley, J., Edis, T. And Reichl, J, 2011, Learning the hard way: Australian policies to reduce carbon emissions, Grattan Institute, Melbourne

- 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 population<sup>23</sup>.
- 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.

## 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:

- *HEAT (Home Energy Advice Team)* – provides residents with free, independent, expert advice to help consumers save money and reduce greenhouse gas emissions by reducing energy consumption in and around the home.
- *Home energy actions kit* – a kit that may be borrowed from any ACT Public Library to help residents of the ACT to perform an energy audit of their home and develop a 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

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<sup>23</sup> <http://www.energyrating.gov.au/library/pubs/201110-retro-review-e3-program.pdf>

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, or made redundant by, 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, labelling is usually related directly to minimum performance standards. 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 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;
- the potential energy efficiency savings are not sufficient to overcome other characteristics (i.e. location, amenities, functionality, size, appearance, 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 property choice<sup>24</sup>.

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

Currently in the ACT energy suppliers are required to show, in billing information, how household's energy consumption and associated GHG emissions varies over time. Further, bill benchmarking is set to be introduced nationally as part of the National Energy Customer Framework, which will provide consumers with information on their energy bills and how their average daily energy consumption compares against an appropriate benchmark – such as all other households in the ACT.

While benchmarks will enable residential customers to compare their daily use against others, thus partially addressing information gaps, this information will not address identified barriers such as bounded rationality, split incentives or other information failures. It is anticipated that following the implementation of energy bill benchmarking, further information will be required by households to inform them of actions that may be taken to improve their energy efficiency.

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<sup>24</sup> Department of the Environment, Water, Heritage and the Arts, (2008) *Consultation RIS for the Mandatory Disclosure of Commercial Office Building Energy Efficiency*, p42

## Market based initiatives

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 a recent Grattan Institute Report (April 2011) *Learning the Hard Way: Australia's Policies to Reduce Emissions*, 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. This is also consistent with the experience of the South Australian Residential Energy Efficiency Scheme (REES), where suppliers substantially overestimated the cost of meeting scheme targets in the early years.

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



# The use of market-based approaches

## Mutual recognition

Market-based approaches have been identified as the most appropriate and cost-effective means of meeting the ACT's objectives. The interaction and complementarity between an ACT market-based scheme and other pre-existing and proposed schemes is discussed below.

## National legislation

The ACT Government, through the National Partnership Agreement on Energy Efficiency, has committed to the development of a nationally consistent and coordinated package of measures to advance energy efficiency outcomes across the Territory's economy.

In 2010, the Prime Minister's Task Group on Energy Efficiency<sup>25</sup> recommended the development of a national energy savings initiative to replace existing state-based supplier obligation schemes. The Task Group reported that an energy savings initiative would form the final piece of a comprehensive framework of market-based instruments, in addition to a carbon-pricing scheme and national renewable energy targets, that work together to provide incentives for all Australians — households, businesses and industry — to contribute to reducing Australia's greenhouse gas emissions.

In-principle support for the development of a national retailer obligation energy efficiency scheme was voiced in the Commonwealth Government's recently released Clean Energy Future package, which committed to expediting the development of a national energy savings initiative, as recommended by the Prime Minister's Task Group on Energy Efficiency. The Commonwealth Government has undertaken consultation with stakeholders, including the ACT Government, to assess the regulatory impacts of a national scheme. The development of a national scheme will be subject to COAG agreement and is not expected to be implemented until 2014 or 2015 at the earliest.

ESDD's analysis of the current political situation suggests that the greenhouse gas reduction targets set by the ACT Government mean efficiency targets or schemes developed at a national level are unlikely to be ambitious enough to meet the ACT's needs.

## Carbon pricing

The most notable future policy development at a national level with respect to energy consumption is the expected introduction of a price on carbon under the *Clean Energy Future* package. The announced carbon price addresses some of the key market failures relating to climate change by imposing a price on GHG emissions, thus forcing emissions to become a consideration in any transaction decision. While the exact design, timing and level of any price on carbon remain an area of some uncertainty, this RIS assumes that there will be a \$23/tonne CO<sub>2</sub>-e and utilises an approach based on the best available information at the time of modelling.

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<sup>25</sup> Prime Minister's Task Group on Energy Efficiency, *Report of the Prime Minister's Task Group on Energy Efficiency*, 2010 <http://www.climatechange.gov.au/government/submissions/pm-task-group.aspx>

As identified in the VEET RIS, the point to which a national carbon price addresses market failures will depend on the extent to which the carbon price matches the true environmental cost of energy production, transmission, and use, and how effectively this price information is communicated to relevant parties (such as energy end-users).

The proposed carbon price will provide some incentives for low-carbon energy sources and more efficient use of energy in the ACT. Even with a price on carbon, however, a number of residual impediments to energy efficiency identified above exist that will persist, even with the operation of other policy measures. Ultimately, in the absence of a price on carbon, the proposed Scheme will accelerate GHG abatement by reducing the demand for energy. With the introduction of a price on carbon, the scheme will be a complementary measure that delivers low-cost abatement not incentivised by a carbon price. Further, the ACT's own greenhouse gas reduction targets require carbon reduction measures beyond those required nationally.

### Existing jurisdictional legislation

In Australia, the following supplier obligation schemes are in operation:

- **The South Australian Residential Energy Efficiency Scheme (REES)** commenced in January 2009 and applies to all electricity and gas suppliers with over 5,000 customers. Energy savings measures, as well as energy efficiency audits, must be delivered in the residential sector, with a focus on low-income households.
- **The Victorian Energy Efficiency Target Scheme (VEET)** commenced in January 2009 and applies to all electricity and gas suppliers with over 5,000 customers. The scheme is market-based with energy savings measures being delivered by third party providers for the residential sector. A recent RIS endorses its extension to the Victorian small business sector. A study of the proposed expansion of the VEET scheme to include households and small and medium sized businesses suggests the net benefits under carbon pricing may be substantial. Estimates show that the net present value of benefits exceeds that of costs by a ratio of 2.7 to 3.1 for the worst and best options considered, respectively.
- **The NSW Energy Savings Scheme (ESS)** commenced in July 2009, replacing the demand side abatement rule under the NSW/ACT Greenhouse Gas Abatement Scheme. The scheme is market-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. Energy savings measures can be delivered in the residential, commercial and industrial sectors.

### An ACT certificate-based scheme

According to Grattan Institute analysis, larger markets improve the trading efficiency and reduce the potential for market power that reduces productivity and innovation<sup>26</sup>. Market mechanisms dominated by a small number of buyers and/or sellers of certificates often result in illiquid markets.

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<sup>26</sup> Daley, J., Edis, T. And Reichl, J., 2011, Learning the hard way: Australian policies to reduce carbon emissions, Grattan Institute, Melbourne

Given the small size of the ACT, the implementation of its own market-based scheme would involve significant costs.

ESDD has explored a range of options to promote energy efficiency in the ACT, including joining or leveraging off the NSW Energy Savings Scheme (ESS) or the Victorian Energy Efficiency Target scheme (VEET). This reflects the Environment and Sustainable Development Directorate's preference for using market-based instruments that deliver energy savings at the lowest cost and our desire for convergence, federally, of technical standards and rules for energy efficiency incentives in the national economy. Neither the VEET nor ESS scheme options have been assessed as practicable in the short term however, due to the largely non-industrial make-up of the ACT economy, a misalignment with technical energy efficiency opportunities in the ACT economy, or because of legislative or other barriers in those jurisdictions.

### An ACT supplier obligation energy savings scheme

The remaining option for implementing a market-based energy efficiency scheme in the ACT is a non-certificate based scheme closely modelled on the REES operating in South Australia. Although the REES is not certificate-based with regard to certificate trading, the scheme requires suppliers to be price competitive in the delivery of energy efficiency outcomes, so as to minimise pass-through costs to their customers. In this sense it has the core element of a market-based scheme.

*A Review of Market-based Schemes to Drive Energy Efficiency (2008)* by the Centre for Energy and Environmental Markets (University of NSW) concluded that it is possible to have a scheme where the certificates are not tradeable, but is in all other respects the same. Another example of a successful non-certificate based scheme is the UK Carbon Emission Reduction Target (CERT) scheme. Architects of the CERT decided against full trading because they found that no stakeholder was able to identify a specific type or mechanism for energy savings that would be more likely to be developed under a certificate-based scheme arrangement than under direct contracting with suppliers.

The REES scheme also has features relevant to the ACT Government's policy objectives around providing support to low-income households. A fixed term REES-type scheme should also allow for a transfer to a national scheme, should that emerge, without having to address issues of the transfer of certificates between the two schemes.

Under the scheme, suppliers will have incentives, through the abatement value created by energy efficiency activities, to seek out and overcome the normal barriers for consumers to installation of efficient products – such as lack of time, lack of information and structural barriers such as split incentives. The scheme will overcome the market failures outlined above in a number of ways.

### Bounded rationality and organisational failures

Suppliers 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 may be overcome by suppliers offering inducements for the purchase and installation of energy efficient products.

### Public good information, information spill-overs and information asymmetry

It is anticipated that the proposed scheme will address information failures, as it will be in the supplier's interest to provide information around activities they wish to undertake on the behalf of consumers.

### Principal-agent problems

The scheme may also overcome the problem of split incentives, as the supplier 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 amenity. In addition, suppliers may offer to finance initiatives up-front and seek repayment of costs over time, including through energy bills over the term of a lease.

### Early mover spill-overs

A greater interest in energy efficient products by both suppliers and consumers may 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.

## Summary of the proposed ACT energy savings scheme

A non-certificate based supplier obligation energy efficiency scheme (the Scheme) is proposed to commence in the ACT from 1 January 2013. This date corresponds to the intended commencement of the National Energy Customer Framework (NECF) and the proposed starting date for the Commonwealth's carbon pricing mechanism.

The Scheme is not intended to last indefinitely. The proposed Scheme would be a transitional measure run in three year phases, subject to review. The Scheme has been designed with a consideration of a potential future transition of all jurisdictions' schemes to a national scheme – should such a scheme be agreed by Commonwealth, state and territory governments.

The proposed Scheme is intended to be complementary to the proposed Commonwealth's *Clean Energy Future* package, which will target major emitters of greenhouse gases – rather than households.

The overall Scheme design is based on the South Australian REES, with a number of significant differences (see *Departures from REES model* from page 34) and utilises the broad set of energy saving activities eligible under the VEET scheme.

The Scheme will commence with coverage of the ACT residential sector, and will include the small and medium-sized enterprise sector from the start date following a further regulatory impact assessment and the expansion of the VEET scheme to SMEs from 2012. A number of Scheme design elements are able to be reset through a combination of regulations, notifiable and disallowable Instruments.

The proposed Scheme will address the key objectives of the Government's intervention to overcome the outlined market barriers to improved energy efficiency in the Territory, as outlined below.

### Encourage the efficient use of electricity and gas

The proposed scheme seeks to increase the efficient use of electricity and natural gas in the ACT by incentivising electricity suppliers to install efficient products or undertake activities.

As identified in the VEET RIS, households are relatively homogenous with respect to their energy consumption patterns, and as such it is possible to make accurate predictions as to the full lifetime energy savings benefits of these activities across the entire household sector.

The impact of a carbon price on energy consumption in the Territory has been modelled and this scheme is targeting savings over and above that level. While some decrease in demand will occur due to increased energy prices as a result of the carbon price, this behaviour response is expected to be small – as a range of underlying market failures identified previously will remain.

### Reduce GHG emissions associated with stationary energy use in the ACT

The proposed Scheme will accelerate GHG emissions reductions in the Territory, by overcoming market failures to reduce the demand for energy – which contributes significantly to our greenhouse

gas emissions profile. A summary of expected greenhouse gas savings resulting from the Scheme are provided from page 56.

### Reduce household and business energy costs

Energy efficiency measures often have a short pay-back period on their initial cost. Private investment in energy efficiency products and services by households and businesses lowers their energy consumption compared to doing nothing. It also lowers energy prices relative to business-as-usual where these activities lead to reductions in peak energy demand, thereby allowing investment generation in network augmentation to be deferred or avoided. The cost saving from energy efficiency activities will be greater when there is some form of carbon pricing in the economy.

Analysis undertaken to support *Weathering the Change Action Plan 2* demonstrates that energy efficiency is the most cost-effective way for the Territory to abate greenhouse gas emissions in Australia. Increasing energy efficiency will therefore reduce costs to the ACT community in meeting our legislated greenhouse gas reduction targets.

A recent study on a proposed expansion of the VEET scheme to include households and small and medium sized businesses suggests the net benefits under carbon pricing may be substantial. Estimates show that the net present value of benefits exceeds that of costs by a ratio of 2.7 to 3.1 for the worst and best options considered, respectively. It is the Government's intention to allow small to medium sized businesses to participate in the Scheme following the completion of a further regulatory impact assessment in 2012. This assessment will build on final policy decisions regarding the expansion of the VEET scheme expected to be announced by early 2012.

A summary of expected energy cost savings resulting from the Scheme, based on household only participation, is provided on page 53. A further RIS will be prepared outlining the impact of including ACT business participation later in 2012.

The ACT Government has acknowledged that low-income households will be disproportionately impacted by rising energy costs and has implemented policies to offset these rises, including Concessions Programs and a range of Outreach Program initiatives. These 'priority households' will be net beneficiaries of the proposed Scheme as suppliers will be obliged to deliver energy savings products and services to them. Suppliers may need to offer additional incentives to priority households to the extent required to ensure their participation under the scheme. This may include subsidised or free products and services or innovative financing packages, such as the ability to repay the cost of services through energy bills. The experience of the REES scheme is that targets set for engaging priority households have been significantly exceeded.

It is ESDD's preference that the legislation package be developed to include a degree of flexibility. This will allow the Minister and the Scheme Administrator to refine specific details of the Scheme as necessary through regulations, or Disallowable or Notifiable Instruments in response to changes in technological, social, economic or political considerations. This flexibility will be balanced against a degree of predictability for electricity suppliers regarding their expected obligations under the Scheme, and the right of the Legislative Assembly to deliberate on changes that may impose significant additional costs on electricity suppliers, and therefore the ACT community.

## Summary of ACT Scheme legislation

The key concepts of the proposed Scheme are summarised below, and definitions and legislative mechanisms are provided in Table 3: Key Scheme concepts (page 32). The following provides a high-level overview of the proposed Scheme.

1. A legislated requirement on electricity suppliers in the ACT to achieve targets in relation to:
  - stationary energy emissions reduction within the ACT in tonnes CO<sub>2</sub>-e; and
  - stationary energy emissions reductions for priority (low-income) households in tonnes CO<sub>2</sub>-e.

These are set for the Scheme as a whole and suppliers on a pro rata basis in relation to energy sales market share.

2. Suppliers defined as being either Tier 1 or Tier 2, which will influence the way in which they must meet the above targets.
3. Financial penalties applied to suppliers for failure to achieve legislated targets charged in relation to tonnes CO<sub>2</sub>-e.
4. Any monies raised as a result of the Scheme to be returned to government revenue and must be re-allocated to projects or programs that meet the objectives of the Scheme (the Objects of the Act).
5. Make good provisions, including a limited capacity for suppliers to roll-over a minor shortfall to a following year.
6. A schedule of eligible activities deeming the extent to which activities contribute to meeting a supplier's targets, including a differentiated obligation for Tier 2 suppliers.
7. A process to add activities to the schedule of deemed activities.
8. A process for suppliers to apply to have project-based initiatives (not-deemed) contribute to meeting their targets.
9. A capacity for suppliers to subcontract emissions reduction and audit activities.
10. A capacity for suppliers to transfer 'credits'.
11. Scheme administration by a statutory authority.
12. Annual reporting by suppliers on their compliance with Scheme rules.

## Key Scheme concepts

The following table provides a summary of key concepts in the proposed legislation.

**Table 3: Key Scheme definitions and legislative mechanisms**

Concept	Definition	Mechanism
<b>Tier 1 supplier</b>	Electricity suppliers with annual electricity sales of 500,000MWh or greater to customers in the ACT in a compliance year.	Defined in Act
<b>Tier 2 supplier</b>	Electricity suppliers with annual electricity sales of less than 500,000MWh to customers in the ACT in a compliance year.	Defined in Act
<b>Energy savings target (EST)</b>	The overall greenhouse gas reduction to be targeted during each year of the Scheme, expressed as a percentage of total electricity sales in the ACT.	Set by Disallowable Instrument
<b>Emissions Factor</b>	The number of tonnes of carbon dioxide equivalent greenhouse gas emissions attributed to the consumption in the ACT of 1MWh of electricity.	Set by Disallowable Instrument
<b>Supplier Energy Savings Obligation (SESO)</b>	The amount of greenhouse abatement that must be achieved by a given supplier by undertaking eligible activities within the ACT in a given year expressed in tonnes CO <sub>2</sub> -e.  $\text{SESO} = \text{EST} \times (\text{Electricity Sales} \times \text{Emissions Factor})$	Determined by supplier and Scheme Administrator by applying EST to supplier sales
<b>Priority Households Target (PHT)</b>	The total reduction in greenhouse gas emissions to be achieved by tier 1 electricity suppliers undertaking eligible activities at priority households in a compliance period, expressed as a percentage of the supplier's energy savings obligation of tier 1 electricity suppliers in the ACT.	Set by Disallowable Instrument
<b>Supplier Priority Households Obligation (SPHO)</b>	The amount of greenhouse abatement that must be achieved by a given supplier at priority group households by undertaking eligible activities within the ACT in a given year expressed in tonnes CO <sub>2</sub> -e.  $\text{SPHO} = \text{SESO} \times \text{PHT}$	Determined by supplier and Scheme Administrator by applying PHT to SESO
<b>Eligible activities</b>	An energy saving activity a relevant entity may undertake to meet their energy savings target.	Defined by Notifiable Instrument
<b>Abatement factor</b>	The number of tonnes of carbon dioxide equivalent emissions that an eligible activity is taken to save.	Defined by Notifiable Instrument



Concept	Definition	Mechanism
<b>Priority households</b>	Low-income households that meet a set of criteria as determined by the Minister.	Defined in Act, with provision to define further households by regulation
<b>Scheme Administrator</b>	<p>An external body appointed by the Minister, who is responsible for:</p> <ul style="list-style-type: none"> <li>• establishing reporting and record keeping requirements for electricity suppliers;</li> <li>• determining electricity suppliers' compliance with the supplier's energy savings obligations;</li> <li>• approving acquisition of abatement factors;</li> <li>• approving codes of practice;</li> <li>• preparing annual reports;</li> <li>• reporting to the Minister, at the Minister's request, on anything relating to the operation or administration of this Act; and</li> <li>• establishing and administering the energy efficiency fund.</li> </ul>	<p>Role of the Administrator broadly defined in Act</p> <p>The identity of the Administrator will be set by appointment</p>
<b>Compliance plan</b>	A report issued by each ACT electricity supplier to the Scheme Administrator demonstrating, in advance of a compliance year, how they intend to comply with the Scheme's requirements.	Act provides the ability for Administrator to define supplier reporting requirements
<b>Annual report</b>	A report issued by the Scheme Administrator on overall Scheme compliance and operation.	Defined in Act
<b>Shortfall penalty</b>	<p>The penalty a supplier is liable to pay for not achieving their SESO or SPHO.</p> <p>The shortfall penalty is \$70 per tonne of carbon dioxide equivalent greenhouse gas emissions in the shortfall.</p> <p>In the first 6 months of the Scheme 50% of this shortfall may be carried forward into the next compliance period. In subsequent years 10% may be carried forward, excluding in the final year when no shortfall may be carried forward.</p>	Defined in Act
<b>Energy Savings Contribution (ESC)</b>	The fee a Tier 2 supplier may pay to meet a SESO, if they choose not to undertake energy savings activities for a compliance period, expressed as an amount in dollars per tonne of carbon dioxide equivalent greenhouse gas emissions. This is set at \$37/t CO <sub>2</sub> -e.	Defined by Disallowable Instrument

Concept	Definition	Mechanism
<b>Funds</b>	Any energy savings contribution paid by Tier 2 suppliers must be paid to government, and these funds must be used to support initiatives of undertake activities consistent with the objects of the Act.	Defined in Act
<b>Scheme review</b>	The Minister must commence a review of the operation of the Act in January 2014 to consider the operation of the Act after 2015.	Defined in Act

## Departures from REES model

While the outlined Scheme has been largely modelled on the South Australian Residential Energy Efficiency Scheme, it differs on two key points – the exclusion of a requirement for suppliers to undertake energy audits and the establishment of differential obligations for Tier 1 and Tier 2 suppliers.

### Exclusion of the requirement for suppliers to undertake energy audits

A key aspect of the REES is the requirement that suppliers meet targets for provision of energy efficiency audits in all households and in low-income households, in addition to meeting greenhouse gas reduction targets.

ESDD notes that the requirement for priority group household audits was developed to address a principal outcome required of the Scheme: to increase social equity by providing opportunities for vulnerable households to lower energy use and costs. The Directorate has a number of concerns regarding the setting of a specific audit target, these include:

- a number of existing programs that target low-income households and provide an audit function currently exist in the ACT;
- audits do not necessarily lead to emissions reductions and savings for households, rather implementation of efficiency actions do;
- placing more restrictions than essential on suppliers increases the delivery and reporting complexity of the Scheme, and may not allow suppliers to reduce emissions in the most cost-effective way; and
- a requirement to carry out audits is not specified under the Victorian or NSW energy efficiency schemes – which may increase the difficulty in eventual alignment with a national scheme.

Opportunities therefore exist for suppliers to coordinate with existing energy audit providers through the existing HEAT and Outreach programs in the ACT. However, as the targets for energy efficiency increase over the Scheme's duration, it is anticipated the suppliers will build their own energy audit capability as an integrated part of their service offering to the ACT community.

### Definition of Tier 1 and Tier 2 suppliers

One of the key barriers to new entrants in our electricity retail market is the administration cost of complying with local legislation and licence conditions compared to the low sales volumes (because of our small size) and margins (because of our effective price regulation system) that are available.

The Scheme will seek to avoid imposing substantial new administrative burdens on small suppliers and new market entrants by allowing them to discharge their obligations through a Energy Savings Contribution equal to the expected marginal cost of participation in the Scheme.

These issues and the Government’s proposed design response are discussed further on pages 37 and 39. Table 4 provides definitions of Tier 1 and Tier 2 suppliers for the purposes of the Scheme. The Directorate considers it unlikely that a supplier would cross this threshold over the first period of the Scheme given the large gap that currently exists between suppliers around this threshold. This will ensure clarity for market participants on their obligations within the Scheme.

**Table 4: Summary of supplier obligations**

Entity	Theshhold for participation	Number of ACT suppliers	Obligation
Tier 1 supplier	500, 000MWh annual sales or greater	1	Must undertake eligible activities Must achieve Priority Household Target
Tier 2 supplier	< 500,000MWh annual sales	18	May undertake eligible activities and/or make energy savings contribution

### Achievement of social equity objectives

Another important aspect of the Scheme is a requirement that energy efficiency activities be undertaken in vulnerable households to increase their opportunity to lower energy use and costs.

#### Defining Priority Households

Under the REES, the determination of those households which fall within the category of priority group households is specified in the Regulations, which provide that **priority group household** means residential premises in which a person resides who—

- a) is the holder of a current pensioner concession card issued by the Commonwealth Government; or
- b) is the holder of a current TPI Gold Repatriation Health Card issued by the Commonwealth Government; or
- c) is the holder of a current War Widows Gold Repatriation Health Card issued by the Commonwealth Government; or
- d) is the holder of a current Gold Repatriation Health Card (EDA) issued by the Commonwealth Government; or
- e) is the holder of a current Health Care Card (including a Low Income Health Care Card) issued by the Commonwealth Government; and/or
- f) is a recipient of the South Australian Government Energy Concession; or

- g) falls within a class of persons who are experiencing hardship determined or approved by the Commission for the purposes of these regulations.

Of the 81,217 energy efficiency activities undertaken by obligated suppliers under the REES in 2010, 32 per cent (51.1 per cent in 2009) were conducted in priority group households. In terms of greenhouse gas emission reductions (tCO<sub>2</sub>-e), 31 per cent (40.5 per cent in 2009) is attributable to activities conducted in priority group households, against the target of 35 per cent. The target for 2010 was well exceeded, with suppliers utilising 30,680 tCO<sub>2</sub>-e of available priority group excess from the 2009 year to meet 2010 priority group targets.

The 35 per cent target set under the scheme is based on the number of South Australian households which would fall within the definition of priority group household (given the likely cross-over in relation to the qualifying criteria, with a single household potentially meeting multiple criteria).

The following groups were identified through consultation for potential inclusion in the ACT Scheme:

- recipients of Energy Concessions (currently open to holders of Centrelink Pensioner Concession Cards, Centrelink Low Income Health Care Cards and Veteran's Affairs Pensioner Concession Cards);
- holders of a Department of Veterans' Affairs card, TPI gold repatriation health care card, war widows repatriation health care card, or the gold repatriation health care card;
- low-income home owners who do not qualify for the above Energy Concession;
- households accessing utility providers' hardship programs;
- households accessing ACAT-EW assistance;
- customers with mental health issues;
- households renting in the private rental market; and
- customers living in poor housing stock (i.e. ACT houses which have less than a two star rating).

The above list has been developed recognising that priority group households should not be narrowly defined, and should include all households where the major source of income is a pension or benefit from Centrelink. Further, identifying a wide range of customers eligible for priority group household status may improve a supplier's ability to identify and hence engage with vulnerable households.

Whilst the ESDD acknowledges the validity of including the identified groups in the priority target under the Scheme, and ensuring the definition is broad, there are practical limits set by the accurate identification and verification of these households. Particular difficulty may be encountered by suppliers, for example, in identifying and verifying low-income home owners who do not qualify for other concessions. Creating a verification mechanism for these categories may add to the cost of compliance for suppliers as well as to the overall administration of the Scheme.

A significant amount of work remains to identify groups in need in the community and it is important therefore that the Scheme maintains a degree of flexibility over these definitions so that they can be

broadened, and new groups added over time. It is proposed that the defined priority households under the Scheme legislation initially include the following groups, with the Minister having the power to expand this definition by regulation in the future as the Scheme develops.

- a recipient of an Energy Concession; or
- a holder of a Commonwealth pensioner concession card or health care card; or
- a holder of a Department of Veterans' Affairs card, TPI gold repatriation health care card, war widows repatriation health care card, or a gold repatriation health care card.

### Setting the Priority Household Target (PHT)

The establishment of a PHT, being the minimum proportion of energy savings that must be achieved in low-income or other disadvantaged households in a given year, is a key Scheme parameter.

It is important to note that modelling of the Scheme, presented from page 46, indicates the Scheme has a positive net present value, meaning that there are net economic benefits from the Scheme to be shared by all Territory households. Given the costs of the Scheme will ultimately be passed through to all energy users in the Territory, a high PHT ensures that these households will benefit disproportionately from the Scheme. Conversely, a low PHT may result in these households not being effectively targeted, resulting in them facing a disproportionate cost burden.

A review of the monthly claims for energy concessions from July 2010 to June 2011 from energy suppliers showed the maximum number of claims in any one month to be 27,395<sup>27</sup>. As the number of rateable residential properties was 136,658<sup>28</sup> at 30 June 2011, the Directorate estimates that at least 20 per cent of ACT households would be eligible for Priority Household status. This analysis indicates that a PHT set just above the proportion of households claiming energy concessions would achieve the objective of ensuring priority households are effectively targeted under the Scheme, while not otherwise distorting the Scheme in a manner that materially decreases its overall cost-effectiveness.

Specifically, a target of 25 per cent is proposed for the first period of the Scheme, reflecting the initial definition of priority group households that will apply to that period. This target is seen as the minimum level that will ensure that priority group households benefit disproportionately from the Scheme. This target and the priority group definition will be reviewed by the Directorate over the course of 2012 with a view to expanding both in future years. The additional costs associated with securing low-income household participation in the Scheme have been factored into Scheme modelling.

### Minimising impacts on competition

While the Scheme will stimulate a broad range of electricity and gas saving activities, obligations will be imposed only on electricity suppliers in relation to their electricity sales. This therefore relates a supplier's obligation to their capacity to pass-through costs through higher electricity retail prices.

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<sup>27</sup> Figure obtained from the Community Services Directorate

<sup>28</sup> Figure provided by ACT Revenue Office

While requiring gas suppliers to participate in the Scheme has some policy benefits, it has been determined that this creates unnecessary administrative and compliance burdens for both the Scheme Administrator and gas suppliers (for whom energy efficiency opportunities are comparatively limited) and thus increases the overall cost of the Scheme. The Directorate has not been made aware, through our consultations, of any material benefits that may result on extending the obligation to gas suppliers in the ACT.

In designing an energy efficiency scheme, ESDD has carefully considered possible impacts on electricity retail market competition, taking into account the unique nature of the ACT electricity retail market.

Competition issues are quite different for the ACT Scheme compared to similar schemes in Victoria, New South Wales and South Australia. The ACT electricity retail market is heavily concentrated, with a single supplier accounting for over 80 per cent of annual electricity sales. While the ACT community currently enjoys relatively low retail electricity prices and high rates of customer satisfaction, the Government recognises that over the long term a vibrant and competitive electricity market will deliver lower pricing and more innovative products.

The ACT has one large electricity supplier (Tier 1) and 18 smaller suppliers (Tier 2) licenced to retail electricity in the ACT.

The inclusion of a low participation threshold was considered during the development of the Scheme. However, based on feedback received from a number of suppliers through the consultation period, it is proposed this not be included in the final Scheme due to concerns that setting a threshold entry level would provide a competitive advantage to Tier 2 suppliers below the threshold, which in turn would disadvantage Tier 2 suppliers above the threshold and compromise competition in the ACT.

The overall impact of the Scheme's design balances:

1. the need to provide a level playing field for all market competitors;
2. the need to minimise distortions and perverse competition outcomes; and
3. the need to ensure that smaller suppliers are not prohibited, due to compliance burdens, from developing their ACT customer base – it is recognised that smaller market participants will lack economies of scale required to support efficient scheme participation.

The proposed approach to resolve these conflicting requirements is to:

- ensure an equal opportunity for all suppliers to participate in the Scheme;
- create financial liabilities under the Scheme directly proportional to each supplier's capacity to pass through costs (electricity retail market share);
- provide additional flexibility for Tier 2 suppliers to 'opt in' to a simplified obligation that limits and caps administration burdens and transaction costs at a rate that reflects the average cost of participating in the Scheme for a Tier 1 supplier.

### Differential obligation for Tier 2 suppliers

As outlined previously, Tier 2 suppliers will have the opportunity to pay an Energy Savings Contribution (ESC) in place of compliance with the Scheme through the undertaking of energy efficiency activities. These funds, estimated at approximately 15 per cent of total supplier costs, can then be used by Government to augment Scheme activities by, for example, providing further rebates, or demonstrating innovative projects.

To avoid favouring either Tier 1 or Tier 2 suppliers, the ESC rate for Tier 2 suppliers should be set at the average cost of Tier 1 compliance. This in turn must be equal to or less than the shortfall penalty rate. Marginal cost rates are discussed in *Scheme targets and Impacts* from page 44.

It is expected that this approach will provide a strong incentive for all suppliers to participate in the Scheme to the extent that implementation costs are lower than the shortfall penalty, or for Tier 2 suppliers, Energy Savings Contributions rates.

Reservation about the inclusion of a differentiated obligation under the Scheme was expressed during consultation, as it was suggested it would impose an inequitable risk to Tier 1 suppliers who must pay shortfall penalties. This position was underpinned by two observations – the recent shortage of certificates under the NSW scheme (which has modest targets and a more diversified market), and the significant experience Tier 2 suppliers in the ACT have in operating under energy efficiency schemes in other jurisdictions. However it is important to note that where ESC rates are equal to actual costs for a Tier 1 supplier, no party should be favoured. The ESC is also set by instrument and can be adjusted in the future should a substantial gap emerge between ex ante and ex post compliance costs.

This approach is supported by feedback from Tier 2 suppliers during the consultation process, who broadly supported a differential obligation in the form of an Energy Savings Contributions regime.

Tier 1 suppliers' required participation burden is also expected to be offset by a potential marketing advantage in that they will, over time, build the capacity to offer high-value services to lower a household's energy use. Community demand for such services may also lead to smaller suppliers participating more fully in the Scheme than estimated within the Scheme modelling.

The Minister is also required under the legislation to consider any competition implications when making a declaration of an activity or target under the Scheme.

### Pass-through of costs

An adjustment to the Transition Franchise Tariff (TFT) rate may be made to allow the pass through of costs from 1 January 2013 equal to the expected cost to the Tier 1 supplier of complying with the Scheme. It is expected that all suppliers will adjust their market contract rates to an equal extent to recover their costs. Future reviews of regulated electricity pricing will include an assessment of ex post costs to ActewAGL Retail and this may flow through an equalisation of the Energy Savings Contribution rate for Tier 2 Suppliers. Overall it has been determined that this approach will provide a sufficient ongoing incentive to both ActewAGL Retail and Tier 2 suppliers to reduce their costs of compliance.

In order to ensure reasonable incentive exists for Tier 1 suppliers to undertake abatement activities, rather than opting to pay a shortfall penalty, the penalty for not achieving abatement by undertaking sufficient activities will be set at \$70 per tonne CO<sub>2</sub>-e. It is intended that the shortfall penalty may be passed through to consumers through the TFT only where that is determined by the ICRC to represent the lowest cost option for ActewAGL Retail to comply with the Scheme. Should this situation arise, other policy parameters such as Scheme targets and the scope of eligible activities may be reviewed to ensure the Scheme is operating efficiently and as intended.

This approach is supported by feedback from Tier 2 suppliers during the consultation process who argued for a 'set change' in the TFT to ensure all market participants are able to recover costs.

### Priority household targets

It is essential to meeting the objectives of the Scheme that, at a minimum, Tier 1 suppliers direct energy saving activities at priority group households. If not, the Scheme creates the risk of compounding existing social inequities and sensitivities to expected future energy price rises. For this reason it is proposed that an additional shortfall penalty be set in relation to a supplier's priority household target. The rate will be set at the same rate as the shortfall penalty to send a clear message that meeting the priority household target is an essential component of the Scheme's obligations. This is the approach adopted under the South Australian REES – where suppliers have consistently exceeded their priority household targets.

## Supporting a broad range of energy saving activities

There are two main approaches to determining the abatement achieved by suppliers in order to meet their target – project based assessment or the deemed activity approach. Both of these will be able to be pursued in the Territory's Scheme.

### Project-based assessment

A project-based assessment approach would require suppliers to approach the project Administrator or Government with proposed activities and an appropriate abatement calculation methodology. To support their project ideas, energy suppliers would need to provide supporting data and information on how greenhouse gas reductions would be measured. The proposals and supporting evidence would then be reviewed on a case-by-case basis and be either approved, amended or rejected. This process would require both the supplier and Administrator to invest significant time and resources in developing these activities. The upside is that project-based approaches provide a highly flexible and potentially low-cost way of generating required abatement. Projects may include large-scale projects such as high-density residential base-building upgrades, or broad-based behaviour change programs that are accompanied by smart meters or other incentives for households.

### Deemed activity approach

A deemed activity approach allows suppliers to generate abatement from a predetermined list of prescribed 'eligible activities'. The level of abatement for each activity is deemed in advance and published online. The benefits of this approach are the reduced costs for suppliers that may be associated with developing abatement project measurement methodologies, as well as providing a high degree of certainty for planning purposes.



An important consideration in the design of the Scheme is its compatibility with other jurisdictions' energy efficiency schemes – as this will provide simplicity for suppliers and facilitate a transition to a national scheme. Specifically, the measures developed under the proposed Scheme for the ACT reflect closely the prescribed measures under the VEET. This is due to the extensive and comprehensive work that has been undertaken by Victoria and the recognised success of the Victorian scheme in developing a comprehensive set of measures that have relatively low transaction costs. In addition, the ACT will be able to piggy-back off the extension of the VEET scheme to SMEs in Victoria in 2012.

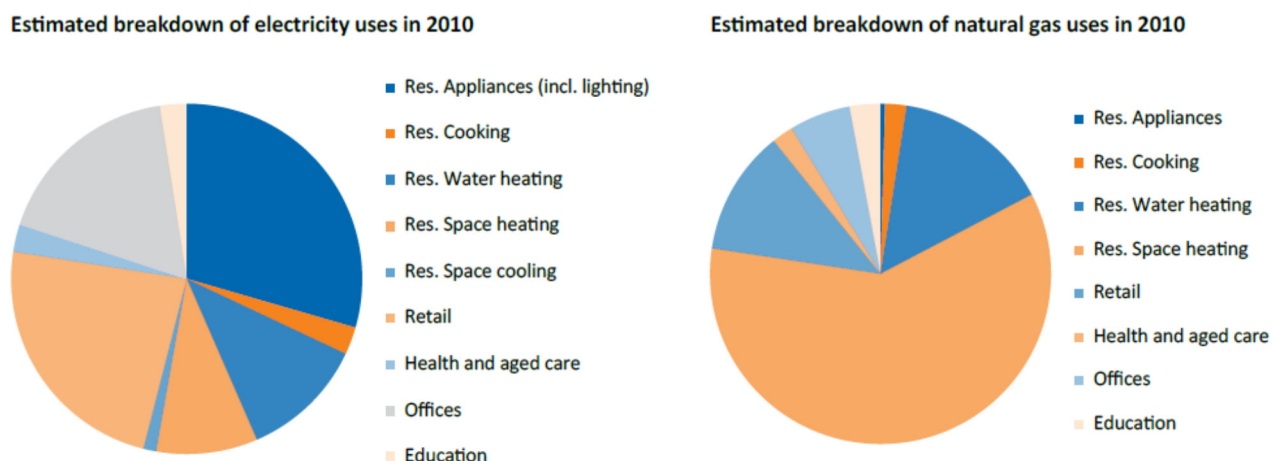
Abatement values for the ACT Scheme have been recalculated to correspond to a better understanding of likely abatement against the ACT's 'business as usual' emissions trajectory, climatic differences and the lower emissions intensity of electricity supplied to the ACT compared to Victoria. The ACT's abatement factors also take into account projected decreasing emissions factors, compared to Victoria, which uses a static emissions factor. A comparison of ACT and Victorian abatement factors is provided in Table 5.

### Comparison of measures

A detailed summary of the abatement measures included in the model is listed in *Appendix A – Summary of Eligible Activities*.

This set of measures concentrates on where the greatest potential benefit can be gained – for example, in areas such as space heating and cooling, water heating and lighting. Figure 8 illustrates the major uses for energy in the Territory, including the high proportion of both electricity and gas used for space heating, and the large proportion of electricity used for domestic appliances and lighting.

**Figure 8: Summary of energy consumption in the ACT by end-use category**



It should be noted that the lists of activities identified would not be permanently fixed. The emergence of new or improved information on the performance of products, or of consumer behaviour, would influence the consideration of including new activities in the Scheme – including a capacity for suppliers to propose project-based measures if this proves to be cost-effective for them.

While the ACT builds on Victoria's measures assessment methodology, the ACT will also have the flexibility to adopt measures based on its own assessment processes.

**Table 5: Comparison of ACT and VIC lifetime abatement achieved by measure**

Measure Name	ACT average program lifetime abatement factor (tCO <sub>2</sub> -e/unit)*	VIC average program lifetime abatement factor (tCO <sub>2</sub> -e/unit)
Install insulation onto an uninsulated ceiling	0.136	0.219
Install insulation into an uninsulated external wall cavity	0.097	0.103
Weather proofing and air sealing	4.290	3.198
Replace SG window with new DG window	0.288	0.335
Install window film to SG window	0.081	0.060
Retrofit DG to an existing SG window	0.193	0.181
Replace central electric resistive heating with HE central ducted gas	95.471	158.600
Install new HE room reverse-cycle air conditioner	1.147	3.200
Replace & upgrade ducting for existing gas ducted heater	11.758	14.246
HE gas ducted replaces existing gas ducted heating	10.272	9.502
Replace an existing shower rose with a low flow shower rose	1.869	2.070
Electric storage HW replaced with gas storage HW	17.756	34.058
Electric storage HW replaced with gas instantaneous HW	18.482	34.058
Electric storage replaced with solar gas-boosted	25.374	14.858 (class 1 bldg) 51.416 (class 2 bldg)
Solar retrofit to existing electric storage	10.923	19.996
Electric storage replaced with heat pump	12.506	n/a
Existing gas storage WH replaced with solar gas-boosted	12.235	8.775
Install a solar pre-heater on a mains gas HW heater	5.289	3.510
Replace incandescent with CFL equivalent	0.154	0.215
Replace 50W QH with LED equivalent (direct replacement)	0.238	n/a
Replace 50W QH with CFL equivalent (direct replacement)	0.210	0.263
Replace 50W QH with CFL equivalent (fitting change)	0.205	0.375
Retirement of Pre-96 refrigerators	1.908	2.490
Installation of standby power controller	1.299	1.980
HE freezer purchase	1.250	n/a

Measure Name	ACT average program lifetime abatement factor (tCO <sub>2</sub> -e/unit)*	VIC average program lifetime abatement factor (tCO <sub>2</sub> -e/unit)
HE refrigerator purchase	1.258	1.905
HE heat pump clothes dryer purchase	1.574	2.552
Installation of HE gas clothes dryer	1.695	3.026
HE television purchase	1.196	2.208
HE dishwasher purchase	0.131	0.200
HE clothes washer purchase	0.805	1.228
HE pool pump	2.847	3.932
Installation of in-home display	1.091	n/a
Top up insulation in a poorly insulated ceiling	n/a	2.770
Install underfloor insulation to uninsulated floor	n/a	12.398
HE gas ducted new home	n/a	4.007
HE gas ducted replaces existing central electric	n/a	158.611
HE ducted RAC replaces existing central electric	n/a	126.233
HE ducted RAC replaces existing ducted RAC	n/a	6.607
HE gas room heater replaces existing gas heater	n/a	1.646
Ducted evaporative replaces room AC	n/a	5.730
Ducted evaporative replaces ducted AC	n/a	11.048
Electric storage WH replaced with solar electric-boosted WH	n/a	45.743

\* Abatement factors for measures marked n/a are subject to further assessment

## Scheme targets and Impacts

The Scheme is expected to have an impact on the following key stakeholders:

- household energy customers – will voluntarily participate in energy saving activities and absorb a proportion of pass-through costs;
- ACT businesses will absorb a proportion of pass-through costs without a corresponding ability to participate in energy saving activities, until the Scheme is expanded beyond the residential sector;
- energy suppliers – will be obliged to undertake energy saving activities under the Scheme;
- energy efficiency service providers and associated trades – the distribution of benefits created in this sector may not be even, with some small businesses and trades benefiting more from the Scheme than others, depending on how suppliers participate in the market for these services. A clear net benefit for this sector will exist, however, as a result of the Scheme;
- Commonwealth Government – faces pass-through costs without a corresponding opportunity to benefit from the Scheme; and
- ACT Government – faces pass-through costs without a corresponding opportunity to benefit from the Scheme – administers the Scheme.

Given the constraints of the information available to inform this analysis, and building on the considerable work undertaken by other jurisdictions, most notably Victoria, the impact analysis undertaken is limited to the broad impacts of the Scheme – rather than on an individual stakeholder basis.

The Scheme has been assessed based on its impact on electricity retail market competition, taking into consideration the ACT interest in developing competitive electricity and gas retail markets (see *Minimising impacts on competition* on page 37), and the costs and benefits of the Scheme to the broader ACT community in net present value (NPV) terms.

### Background to scheme impact modelling

The Scheme will operate by imposing an obligation on electricity suppliers in the Territory to undertake energy savings activities, including low-income (priority group) households. The extent of the obligation will be established through targets which set the level of energy savings that are required each year, measured in tonnes of greenhouse gas emissions abatement.

The ability of suppliers to meet their targets will be determined by the scope of activities that are permitted under the Scheme and their cost. In addition, penalties will apply for each tonne of abatement a supplier falls short of their target in a given year. This provides an underlying incentive for the suppliers to undertake activities that are cheaper than the penalty price on a dollars per tonne basis. If the target is set too high and insufficient activities are allowed, or the cost of that activity is too great, the supplier will pay the penalty price and the actual energy savings will fall short of that targeted.

Therefore the penalty price, the target and the scope of eligible activities have an important relationship. Specifically, it is important that the target does not exceed the level of abatement that is achievable at or below the penalty price. Equally, the penalty price should be decided on the basis of the specific outcomes sought, such as a desired level of abatement or a cost savings or greenhouse gas reduction objective.

In setting the penalty price and targets for the ACT Scheme, the Government has undertaken comprehensive modelling similar to that undertaken for the VEET scheme. The modelling, undertaken by Energetics Pty Ltd, builds on the pitt&sherry baseline model for the ACT including in relation to:

- Stocks of energy using equipment;
- Changes in the emission intensity of grid electricity resulting from a national price on carbon; and
- Projections for energy efficiency improvements across the Territory under business as usual conditions.

The set of eligible activities under the Scheme will be consistent with the VEET scheme and this will be added to over time. For each activity, technical and economic potentials were defined, as were their costs, benefits and NPVs. Each measure was also defined in relation to the extent of cash incentive required to trigger different levels of up-take. This was based on the cost-effectiveness of the activity as well as perceived implementation complexity and risk. The result of this work was, in effect, the development of a cost-supply curve which allowed modelling of the extent of cash incentive to trigger different levels of abatement, with each unit of growth in the cash incentive price added to the stock of activities and associated net present costs or savings.

Also taken into consideration is the potential increased difficulty of targeting priority households, with the cost to suppliers estimated at 150 per cent of normal costs. It is important to note that while this reflects the supplier making a greater contribution to the cost of an activity, this is offset by a reduction in household contributions. The net economic impact of the PHT is therefore assumed to be neutral.

By varying the cash incentive rate, different scenarios were constructed that represent different levels of activity under the Scheme. From this, energy savings targets for different scenarios can be derived. These scenarios are presented in Table 6 below. In this case the level of subsidy the supplier is willing to pay is, in theory, equal to the shortfall penalty minus administration costs.

### Energy costs savings assumptions

The modelling assumes that, for the purposes of determining the Scheme benefits, annual electricity prices are static (and not impacted by Scheme cost impacts). This has the effect of making the savings attributable to the Scheme conservative.

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 recover fixed capital costs that may not reduce as a result of reduced energy consumption. 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. This may

impact future AER distribution price determinations beyond 2013-14 and also trigger a review of the current price determination. Neither of these outcomes would adversely impact costs attributable to the Scheme.

For financial year 2012/2013 onwards a carbon cost is applied. Impacts are based on a mid-range estimated cost per tonne of CO<sub>2</sub> emissions and multiplied by the published state-specific Scope 2 and Scope 3 emissions factor for electricity generation (which varies by year based on Energetics estimates), or the Scope 1 emissions factors for natural gas (which have been kept constant over time). In line with Commonwealth Treasury modelling, it is expected that only 85% of carbon costs are passed through to electricity prices due to the operation of wholesale energy markets. This factor is kept constant through the duration of the forecast.

#### Discounting of costs and benefits due to the Energy Savings Contribution mechanism

As described in previous sections, the Scheme does not require all suppliers to participate in energy savings activities. It recognises that Tier 2 suppliers (with less than 500,000MWh sales per annum) may face unreasonably high overhead costs in establishing energy saving service delivery capacity in the ACT. Under the Scheme these suppliers can discharge their obligation through a simplified process – an Energy Savings Contribution payment. ESDD has determined that up to 15 per cent of the Scheme targets is likely to be discharged in this manner and therefore it is appropriate that the costs and benefits of the Scheme be discounted accordingly. This discounting does not apply to the calculation of pass-through costs, which will occur regardless of the manner in which the supplier chooses to discharge their obligation.

#### Modelling results – marginal costs and target scenarios

Table 6 provides a summary of the range of targets modelled. Each scenario was created by varying the maximum cash incentive rate a supplier would pay to trigger a level of abatement, and therefore the overall level of uptake of initiatives under the Scheme over a 3 year Scheme period. An administration (transaction) cost rate of 10 per cent is assumed, which results in the level of incentive provided to households being less than the full cost to suppliers. This is consistent with modelling and experiences in comparable jurisdictional schemes.

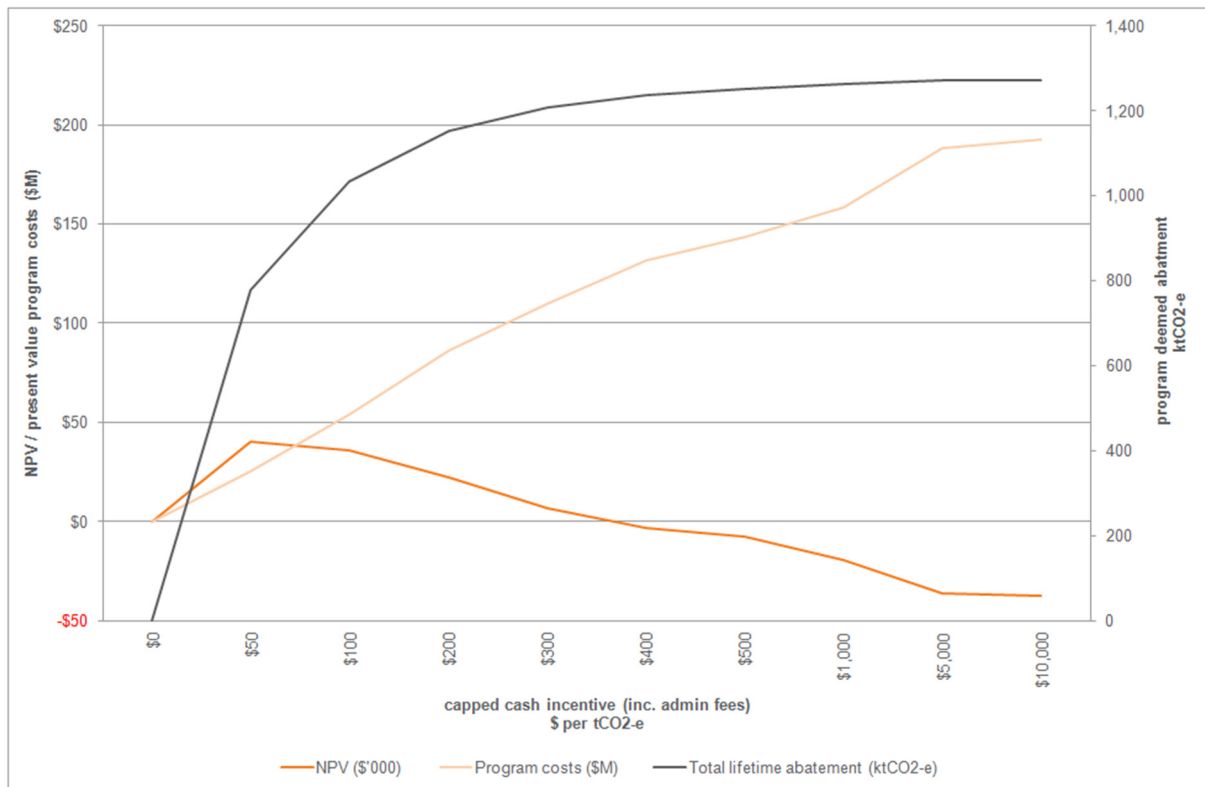
Further information of the modelling approach taken is provided at *Appendix B – Summary of Modelling Approach* from page 64.

**Table 6: Scenarios modelled including marginal cost, NPV, lifetime abatement and cost of abatement**

Scenario	Incentive price cap (\$/tCO <sub>2</sub> -e)	NPV <sup>1</sup> (\$M)	Total lifetime abatement (ktCO <sub>2</sub> -e)	Lifetime Total Bill Savings <sup>2</sup> (\$M)	Scheme household price impact 2012- 2015 <sup>2</sup> (\$)
A	\$0	\$0.0	0	\$0.0	\$0
B	\$10	-\$0.1	51	\$8.8	\$1
C	\$20	\$12.6	323	\$94.2	\$16
D	\$30	\$23.9	514	\$156.9	\$32
E	\$40	\$39.6	751	\$300.8	\$58
F	\$50	\$40.2	778	\$312.0	\$67
G	\$60	\$40.0	872	\$358.0	\$86
H	\$70	\$39.0	941	\$381.0	\$104
I	\$80	\$37.4	986	\$396.2	\$121
J	\$90	\$36.9	1026	\$419.9	\$136
K	\$100	\$36.2	1034	\$422.4	\$144
L	\$110	\$34.8	1052	\$428.0	\$155
M	\$120	\$33.4	1085	\$443.8	\$173
N	\$130	\$33.1	1098	\$450.4	\$184
O	\$140	\$32.4	1104	\$452.3	\$193
P	\$150	\$31.6	1112	\$455.4	\$199
Q	\$200	\$22.4	1153	\$469.3	\$230
R	\$300	\$6.5	1208	\$488.2	\$293
S	\$400	-\$3.4	1238	\$497.7	\$351
T	\$500	-\$7.7	1250	\$501.8	\$381
U	\$1,000	-\$19.6	1261	\$505.7	\$422
V	\$5,000	-\$36.2	1271	\$509.5	\$501
W	\$10,000	-\$37.8	1272	\$509.6	\$513

*\* It is important to note that financial and environmental benefits associated with the Scheme will differ from the modelling. While the modelling assumes a 100% participation rate by suppliers, this is discounted in estimates for the Scheme to reflect that 15% of the targets are expected to be met through Energy Savings Contributions by Tier 2 suppliers*

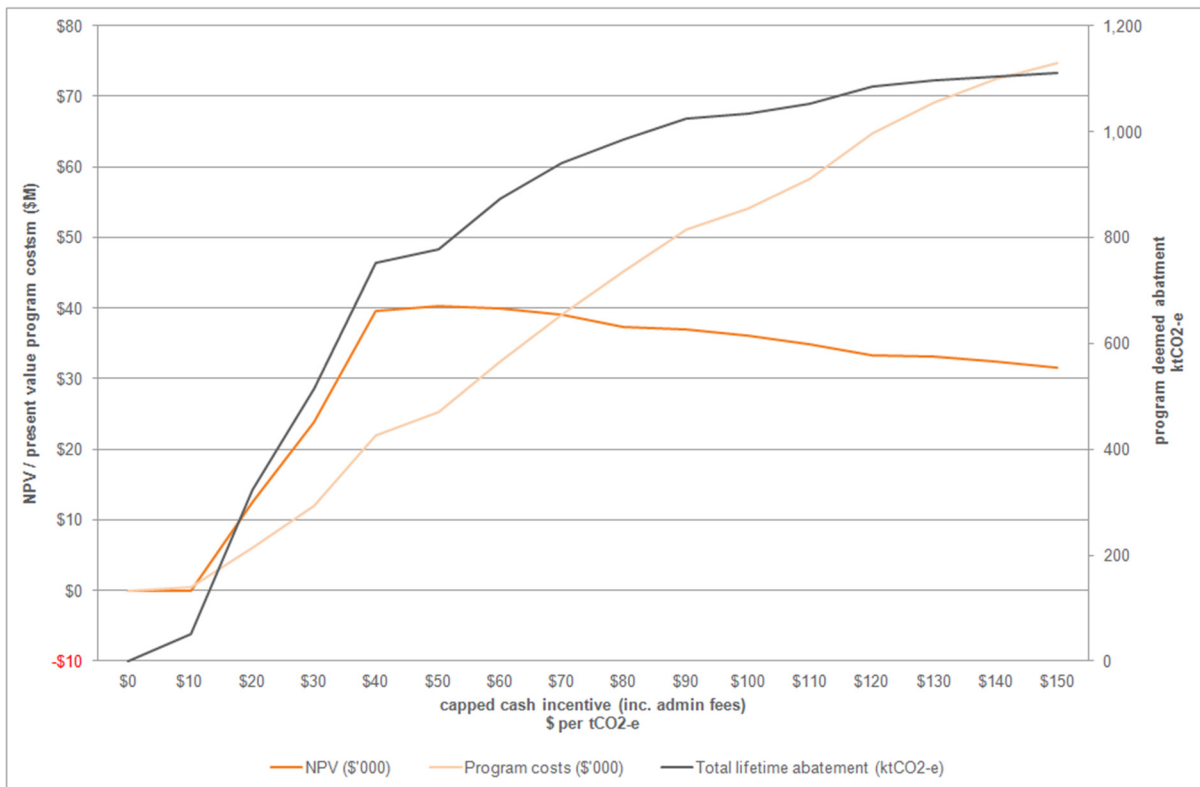
Figure 9: Scenarios modelled including high cash incentive cap range, NPV and lifetime abatement



In the range between \$40 and \$100 NPV levels peak and emissions abatement grows rapidly relative to the incremental growth in Scheme costs. The \$0 to \$150 range is shown in more detail in Figure 10.



**Figure 10: Scenarios modelled including low cash incentive cap range, NPV and lifetime abatement**



This analysis shows that the rate of growth in potential energy savings, measured in levels of greenhouse gas reductions, is subject to exponential decay to a total abatement potential of approximately 1,300 kt CO2-e. The NPV of the Scheme peaks at a cash incentive cap rate of between \$40 and \$60, at around \$40 million.

A cash incentive cap rate of around \$50 would be the rate set if the only objective of the Scheme was to achieve energy cost savings with the greatest economic returns. However, the opportunity to use the Scheme to achieve low-cost greenhouse gas emission reductions is also important and higher cash incentive cap rates have also been considered. After \$60 there is a marked decline in Scheme NPV from its optimal level while the rate in greenhouse emissions growth continues to fall. At this level greenhouse gas savings of around 742 kt CO2-e are achieved. The limit to cost effective greenhouse gas abatement lies at a capped cash incentive rate of \$400. Moving from the \$50 capped cash incentive scenario to a \$60 scenario represents a cost of \$2.50 in NPV per tonne of abatement.

It is important to note that the \$60 cash incentive represents a maximum price and that the average cost to the Tier 1 suppliers is approximately \$37 per tonne of abatement.

This analysis identifies the limits that exist in cost-effective energy savings potential in the ACT residential sector over the term of the Scheme, relative to the portfolio of eligible activities. This is further represented in Figure 11 below which shows the trade-off between economic and environmental outcomes, whilst demonstrating an optimal range that delivers substantial greenhouse gas abatement with positive economic benefits.

**Figure 11: spread of scenarios in relation to economic benefits (NPV) and greenhouse gas abatement**

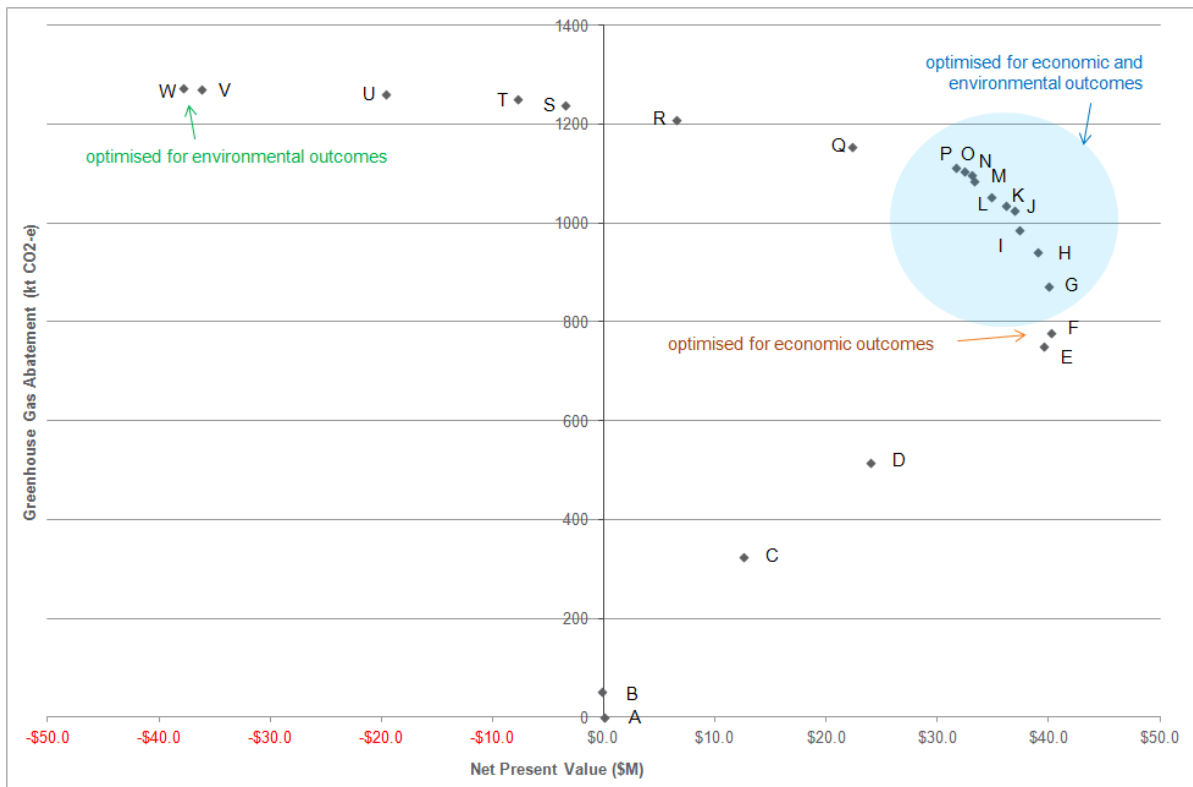


Figure 11 above shows that while a cash incentive cap rate of \$50 per tonne (Scenario F) would result in the highest net economic benefits, the difference between economic benefits and those in the \$60 to \$150 range (Scenarios G through P) is relatively low compared to the 15 per cent increase in greenhouse gas abatement over that range. Particularly, there is a significant jump in emissions abatement from Scenario F to Scenario G with only a very small reduction in NPV.

### Proposed scheme targets

The Directorate has concluded, on balance, that a marginal cost rate of \$60/t CO<sub>2</sub>-e (Scenario G), with an NPV of \$40 million and abatement of 872 kt CO<sub>2</sub>-e represents a relatively high level of ambition while still maintaining relatively strong economic returns to the community.<sup>29</sup> Moving beyond this range achieves diminishing environmental benefits and materially reduces net economic benefits. It is also important to consider the overall novelty of the Scheme in the context of the ACT. It is prudent in this context to commence in a manner which allows for expansion of the Scheme in the future based on its demonstrated efficiency and effectiveness in achieving greenhouse gas abatement. It is proposed that this targeted level of abatement and savings will be reviewed in 2014 and potentially expanded in relation to both the residential and non-residential sectors.

The modelling has been based on implementation over a three-year period from 1 January 2013 to 31 December 2015.

<sup>29</sup> Actual reductions expected from the Scheme are 742tCO<sub>2</sub>-e. This reflects that 15 per cent of the targets are expected to be met through Energy Savings Contributions by Tier 2 suppliers. See page 51 for more information. This discounting approach applies to all benefits set out in the modelling results.

The proposed targets for each period are summarised in Table 7 below. Figure 12 below illustrates proposed Energy Saving Targets expressed in terms of lifetime emissions abatement associated with activities undertaken in a period.

Roll-over provisions are provided for shortfalls of up to 10% to minimise compliance risks and ensure maximum rate of participation through the undertaking of energy saving activities as opposed to the payment of penalties.

**Table 7: Electricity emissions, required savings and proposed Energy Savings Targets for Scheme periods**

Scheme period	Period Date Range	Electricity sales-related emissions (ktCO <sub>2</sub> -e)	Lifetime abatement of eligible activities achieved (ktCO <sub>2</sub> -e)	Energy Savings Target (Not actual annual savings)	Annual pass-through costs (\$M)
Period 1	1 Jan 2013 to 31 Dec 2013	2,679	193.8	7.2%	\$7.2
Period 2	1 Jan 2014 to 31 Dec 2014	2,581	339.1	13.1%	\$12.6
Period 3	1 Jan 2015 to 31 Dec 2015	2,499	339.2	13.6%	\$12.6

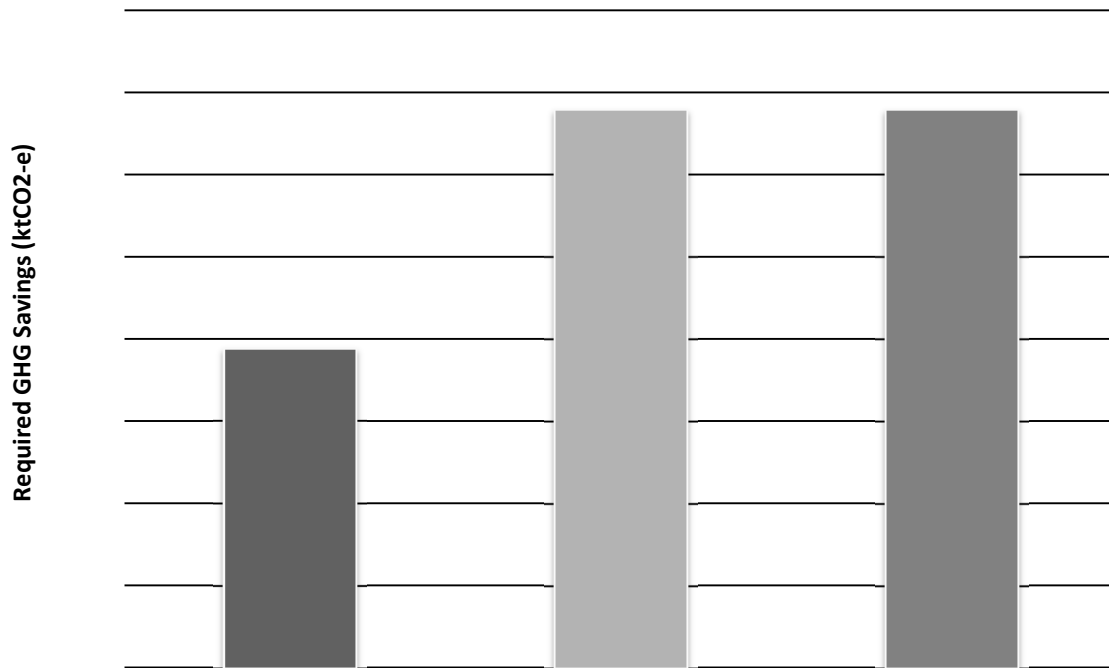
*\* It is important to note that Scheme Energy Savings Targets reflect the total life-cycle energy savings of activities undertaken in a given year (rather than actual reductions in a year) as a percentage of a supplier's own emissions (emissions associated with their own electricity sales).*

For the selected scenario, a total implementation cost of approximately \$77.6M would be associated with the Scheme – based on the installed unit cost and estimated actual total program uptake.

It is not appropriate to compare annual targets among jurisdictional schemes as different methodologies apply. For example, ESDD's modelling takes account of the reduction in emissions intensity of electricity resulting from the expanded Commonwealth Renewable Energy Target and a price on carbon. This has the effect of substantially reducing the level of emissions associated with a given activity over its lifetime. Further, Scheme targets in the ACT are applied to electricity supplier sales only, rather than electricity and gas supplier sales. This has the effect of making targets, expressed in percentage terms, higher than they would otherwise be.

While the overall the ambition of the Scheme is considered to be greater than other jurisdictional schemes, reliable benchmark data is not currently available for the purposes of making this comparison.

**Figure 12: Lifetime emissions reductions associated with activities implemented in each period**



### Shortfall penalty and Energy Savings Contribution rates

Targeting abatement at a capped cash incentive of \$60/t CO<sub>2</sub>-e results in an estimated average cost of \$37/t CO<sub>2</sub>-e for a Tier 1 supplier. This takes into account the increased cost burden of ActewAGL meeting the Priority Household Target. As a result, a contribution rate of \$37/tCO<sub>2</sub>e payable by Tier 2 suppliers is appropriate.

A penalty rate set at \$70/t CO<sub>2</sub>-e should provide a strong incentive for suppliers to comply through the delivery of energy savings activities up to that amount. However, setting the target based on a \$60 incentive cap rates means that, in principle, suppliers should not need to spend that much to achieve their energy savings obligations. It should be expected that penalty rates in the ACT would be moderate to high in proportion to the level of ambition of the Scheme. A penalty rate of \$70/t CO<sub>2</sub>-e is higher than rates in Victoria and NSW and less than rates under the South Australian REES Scheme, which includes a \$70/t CO<sub>2</sub>-e shortfall penalty in addition to a \$10,000 fixed penalty.

In addition, the penalty rate of \$70/t CO<sub>2</sub>-e will also apply to PHT shortfalls to ensure these targets are met. This compares to the additional PHT penalty rate of \$70/t CO<sub>2</sub>-e in South Australia.

### Priority Household Target (PHT)

The section *Achievement of social equity objectives* from page 35 addresses the setting of the PHT. The PHT represents the proportion of the Energy Savings Target that must be achieved in priority households. A target of 25 per cent will be set for the first year and targets for future years will be determined in relation to a review of priority household definitions, with a view to broadening the scope of this group.

**Table 8: Proposed Priority Household Target (PHT)**

Period	Priority Household Target
1 January 2013 to 31 December 2013	25%
1 January 2014 to 31 December 2014	<i>To be determined</i>
1 January 2015 to 31 December 2015	<i>To be determined</i>

### Sensitivity analysis

Sensitivity analysis has been carried out on the recommended \$60 capped cash incentive scenario. The Scheme's response to variation in the discount rate, as well as changes in the energy price has been modelled, with the results shown in Table 9 and Table 10. In all cases NPV remains positive.

**Table 9: Discount rate sensitivity analysis**

Discount rate	NPV (\$M)
3%	\$71
7%	\$40
10%	\$25

**Table 10: Energy price sensitivity analysis**

Energy price range scenario	NPV* (\$M)	Lifetime abatement (ktCO <sub>2</sub> -e)
High	\$62	896
Medium	\$40	872
Low	\$30	815

*\*7% discount rate is applied*

### Modelling results – household costs and benefits

Suppliers participating in the Scheme are expected to pass-through a significant proportion of compliance costs to government, business and residential electricity customers. For modelling purposes this proportion is assumed to be 100 per cent. Unlike the total Scheme costs, which include varying levels of household and supplier co-funding, the costs to suppliers, and therefore the pass-through costs, include only the subsidy component, plus administration costs.

It is important to note that financial and environmental benefits associated with the Scheme will differ from the modelling. While the modelling assumes a 100 per cent participation rate by suppliers, this is discounted in estimates for the Scheme to reflect that 15% of the targets are expected to be met through Energy Savings Contributions by Tier 2 suppliers. Costs however are not discounted and are expected to equal those modelled.

Scenario G (\$60 cash incentive cap) results in a total cost to suppliers and pass-through cost of \$32.4 million over the four periods of the Scheme. This will result in pass-through costs described on an annualised basis in percentage terms in **Table 11** below.

**Table 11: Nominal projected change in residential electricity retail prices**

Scheme period	Electricity price impact
Period 1	1.26%
Period 2	2.09%
Period 3	1.98%

*\*These changes are from business and usual price forecasts for each year and are not cumulative*

A summary of estimated impacts on average household electricity bills is provided at Table 12.

**Table 12: Nominal price impact on energy bills per ACT household (not discounted)**

Scheme period	Pass-through cost	Average annual bill savings
Period 1	\$19	\$66
Period 2	\$35	\$135
Period 3	\$33	\$191
Total	\$87	\$392

Total expected lifetime bill savings for activities implemented under the Scheme are expected to be \$2,227 per household, or \$358 million for the Territory as a whole.

It is expected that up to 70,000 households may participate in the Scheme.

## Business costs

The Scheme will be funded by electricity suppliers, who will pass-through their costs to all energy users on a proportional basis (much like the existing feed-in tariff program). The business and government sectors will bear the costs of the Scheme through higher electricity charges, but will not be able to participate until the set of eligible activities is expanded beyond the residential sector. This is consistent with schemes operating in South Australia and Victoria.

Estimated average costs to business are more difficult to determine due to the significant differences in energy use between different businesses. The total pass-through costs to the commercial sector are expected to be around \$20 million over the life of the Scheme. Examples of costs that may be expected for different types of businesses are shown below. Flow-through costs for electricity spends of \$1,000 and \$10,000 assumes franchise electricity contract rates apply. Flow-through costs for electricity spends of \$100,000 and \$1,000,000 assumes large electricity contract rates apply.

**Table 13: Pass-through cost impacts for a range of business energy users (not discounted)**

Business Size	Small	Medium	Medium	Large
Example	Home business	Lease of single office floor	Large retail or restaurant	Large shopping centre or supermarket
Annual electricity spend \$ p.a. >	\$1,000	\$10,000	\$100,000	\$1,000,000
Period 1	\$15	\$147	\$1,788	\$17,880
Period 2	\$26	\$257	\$3,129	\$31,293
Period 3	\$26	\$257	\$3,129	\$31,294

A recent study on a proposed expansion of the VEET scheme to include households and small and medium sized businesses suggests the net benefits under carbon pricing may be substantial. Estimates show that the net present value of benefits exceeds that of costs by a ratio of 2.7 to 3.1 for the worst and best options considered, respectively.

It is the Government's intention to allow small to medium sized businesses to participate in the Scheme following the completion of a further regulatory impact assessment in 2012. This assessment will build on final policy decisions regarding the expansion of the VEET scheme expected to be announced by early 2012. Following business inclusion in the ACT Scheme, many businesses will be able to undertake energy efficiency activities to reduce their energy use and decrease their energy bills.

### Avoided infrastructure costs

Improving energy efficiency in the ACT residential sector will also lower energy prices relative to business-as-usual where these activities lead to reductions in peak energy demand, thereby allowing investment generation in network augmentation to be deferred or avoided. These cost savings can be significant and have been a major component of the modelled benefits in other jurisdictional schemes, such in the NSW, ESS and VEET.

While these savings will occur in the ACT over the medium to long term in proportion to the achieved electricity demand reductions, national electricity market models are generally not sensitive enough to model demand reductions from small markets such as the ACT. As a result, these savings have not been included in the cost-benefit analysis of the Scheme.

### Reductions in greenhouse gas emissions

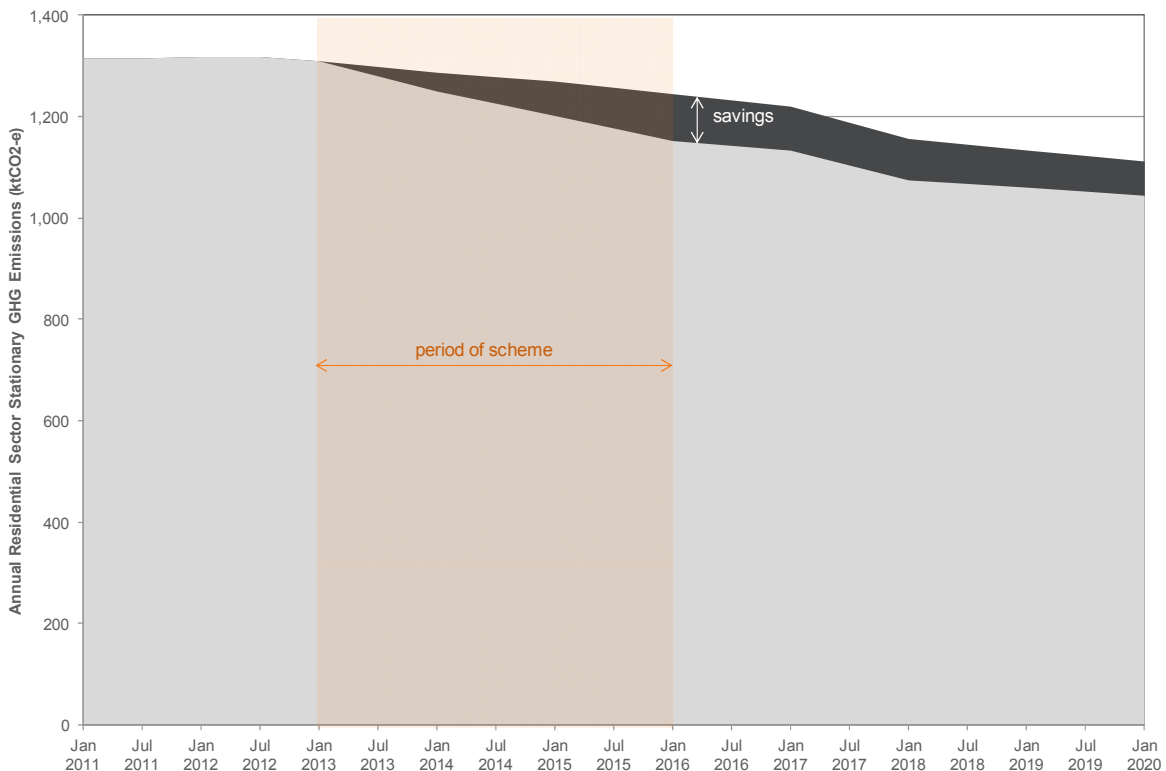
A principal objective of the Scheme is to reduce greenhouse gas emissions in the Territory.

The modelling indicates that Scenario G (\$60 cash incentive cap) will result in activities being implemented by the end of the final Scheme period that will result in total life-cycle greenhouse gas

savings of around 742 kt CO<sub>2</sub>-e or 0.6 t CO<sub>2</sub>-e per household. This constitutes a reduction in residential sector stationary energy emissions of 6.2 per cent in 2015.<sup>30</sup>

The impact of the scheme on ACT greenhouse gas emissions and our 2020 legislated greenhouse gas reduction target is shown in Figure 13 below. This chart shows that a discontinuation of the Scheme at the end of 2015 would see this level of reductions erode to around 4.7 per cent in 2020. Figure 13 also shows that business-as-usual residential sector emissions are expected to decline. This is a result from a range of pre-existing energy efficiency policies, but primarily due to reductions in the emissions intensity of electricity supplied to the ACT as a result of the national Renewable Energy Target and carbon pricing schemes.

**Figure 13: Scheme impact on residential sector stationary energy emissions**



The potential contribution of energy efficiency to the achievement of the ACT’s legislated greenhouse gas reduction targets is described, and the subject of community consultation under *Weathering the Change Action Plan 2*. This level of abatement is broadly consistent with the level of ambition for residential energy efficiency presented in Draft Action Plan 2.

<sup>30</sup> These results have been discounted in relation to the extent of supplier meeting obligations by making Energy Savings Contributions as opposed to undertaking energy saving activities (see page 51).



## Scheme administration and review

### Role of the Minister

The following will be determined by the Minister:

- The Energy Savings Target (EST);
- The Priority Household Target;
- The emissions factor attributed to the consumption of 1MWh of electricity in the ACT;
- Eligible activities intended to reduce the consumption of energy;
- The Energy Savings Contribution payable by Tier 2 electricity suppliers;
- Guidelines for the payment of amounts from the Energy Efficiency Fund; and
- Forms for the Act.

Further, under the Act the Minister must:

- appoint a public servant as Administrator for this Act; and
- commence a review of the operation of the Act in January 2014.

### Role of the Administrator

The Scheme will require an Administrator to establish the operation of the Scheme and monitor the compliance of suppliers with the Scheme's obligations. The Administrator will be a person appointed by the Minister.

As defined in the Act, the Administrator will have the following functions:

- establishing reporting and record keeping requirements for electricity suppliers;
- determining electricity suppliers' compliance with the suppliers' energy savings obligations;
- approving acquisition of abatement factors;
- approving codes of practice;
- preparing annual reports;
- reporting to the Minister, at the Minister's request, on anything relating to the operation or administration of this Act; and
- establishing and administering the Energy Efficiency Fund.

### Establishing reporting and record keeping requirements for electricity suppliers

The Administrator of the Scheme will be responsible for setting out the way in which suppliers report their compliance with the Scheme, so that the Administrator may verify the suppliers' claims in relation to meeting the SESO and SPHT. This may include the development of forms approved by the Minister and any databases or other reporting tools as necessary. This represents a similar role undertaken by scheme Administrators in other jurisdictions with energy efficiency schemes in Australia.

Provision is made under the Scheme, as exists in South Australia, for a compliance plan to be submitted by suppliers to the Scheme Administrator. The purpose of this is to ensure that suppliers are equipped to meet the obligations of the Scheme and the Administrator.

The compliance plan will include:

- how the supplier plans to achieve the supplier's energy savings obligation;
- how the supplier plans to meet health, safety and environmental requirements relating to eligible activities; and
- any other information required under an approved code of practice.

Suppliers, to the greatest extent practicable, will internalise and manage risk and compliance assurance processes on a continuous basis and report annually on compliance to the Administrator.

### Determining electricity suppliers' energy savings obligations

Under the Act, an electricity supplier must give the Administrator the following information in relation to a compliance period not later than 3 months after the end of the compliance period:

- the supplier's total electricity sales in the ACT;
- the eligible activities undertaken by the supplier in the ACT that comply with a relevant approved code of practice;
- the approved abatement factors acquired by the supplier, that comply with a relevant approved code of practice;
- the total abatement factors for the eligible activities undertaken or acquired by the supplier that comply with a relevant approved code of practice;
- for a tier 1 electricity supplier—the total abatement factors for eligible activities undertaken in, or acquired in relation to, priority households by the supplier that comply with any relevant approved code of practice;
- for a tier 2 electricity supplier—the extent to which the supplier's energy savings obligation was achieved by paying an energy savings contribution; and
- any other information required by the Administrator.

In addition to this, the Administrator may also require an independent audit of some or all of the information provided. The Administrator will also have the authority to appoint a public servant as an authorised officer with defined powers to ensure a supplier's compliance with the Scheme.

Upon receiving this information the Administrator will determine a supplier's compliance with the supplier's energy savings obligation and give the supplier notice of the outcome – including any shortfall or surplus.

The Administrator will also be responsible for approving the acquisition of an abatement factor by a supplier from another supplier, with this taken into account when the Administrator determines the supplier's compliance with the Scheme.

### Approving codes of practice

Under the Act the Administrator may approve a code of practice as a Notifiable Instrument outlining:

- consumer protection obligations;
- quality, health, safety and environmental requirements applying to eligible activities;

- record keeping requirements; and
- reporting requirements.

### Preparing annual reports

The Administrator must provide an annual report to the Minister on the operation and administration of this Act including—

- electricity supplier compliance with the Act; and
- the number and type of eligible activities undertaken under the Act.

An annual Scheme report provided to the Minister will meet all relevant reporting and quality assurance requirements.

### Estimated administration costs

The energy efficiency scheme will require a team to be established to undertake the administration role. It is proposed this team will be made up of three ACT Government officers and one executive (who will be appointed by the Minister as the Administrator). The administration role is not expected to require full-time attention, rather with the expected peaks and troughs of the program, 0.5 of each FTE is deemed appropriate.

Funding is proposed for 0.5 of four FTEs for three and a half years. This will be reviewed and possibly extended depending on the status of the Scheme after the review. Total administration costs are estimated at \$295,500 per annum for salaries plus an operating budget of \$200,000 for specialist legal and technical consulting services.

### Funds raised by the Scheme

A further important role of the Administrator will be to administer funds generated by the Scheme to be used to support initiatives and activities consistent with the Objects of the Act.

The following must be paid to the Government:

- any penalty, Energy Savings Contribution (ESC) or shortfall penalty imposed under the Scheme; and

For budgeting and modelling purposes, the ESDD has assumed that all Tier 2 suppliers will acquit their obligations using the ESC mechanism. It is also assumed that, given the shortfall roll-over provisions, no shortfall penalty payment will be received. Administration costs have been estimated and these are subject to revision following the settling of all policy details and administration arrangements (including the Minister's appointment of a Scheme Administrator).

Money not allocated to Scheme administration must be made available to support energy saving initiatives in support of the Scheme's objectives.

**Table 14:** Estimated funds raised, administration costs and activity support funding

Scheme period	Total revenue	Administration	Activity support funding
Period 1	\$1,079,126	\$495,500	\$583,626
Period 2	\$1,888,713	\$495,500	\$1,393,213
Period 3	\$1,888,713	\$495,500	\$1,393,213
Total	\$4,856,551	\$1,486,500	\$3,370,050

## Scheme review

The legislation requires that the Minister must commence a review of the operation of the Act in January 2014. The review must consider the following:

- the operation of the Act after 2015;
- any change required to improve the operation of the Act; and
- the impact of national law and policy in relation to energy efficiency on the operation of the Act.

The Minister must present a copy of the report of the review to the Legislative Assembly not later than nine months after the review commenced.

## Appendix A – Summary of Eligible Activities

Measure Name <sup>31</sup>	End use	Description
Install insulation onto an uninsulated ceiling	Space Heating & Cooling	Install ceiling insulation to dwellings which currently don't have any insulation installed.
Install insulation into an uninsulated external wall cavity	Space Heating & Cooling	Install wall insulation to dwellings which currently don't have any insulation installed.
Weather proofing and air sealing	Space Heating & Cooling	Items include weather stripping to door frame and a draught arrestor to an external door or door to high ventilation area, fit a draught proofing device (e.g. Draft Stoppa) above a ceiling exhaust fan located in a heated area, seal wall vents located in heated areas of an existing dwelling, weather stripping of windows in an existing dwelling and fitting a chimney damper to an open fireplace in an existing dwelling which has electricity or gas fuelled heating as the main form of heating.
Replace SG window with new DG window	Space Heating & Cooling	Install a new double glazed window to replace a single glazed window in an existing dwelling.
Install window film to SG window	Space Heating & Cooling	Install a clear film on an existing single glazed window to create a closed air space to convert it to a double glazed window.
Retrofit DG to an existing SG window	Space Heating & Cooling	Retrofit an additional pane of glass or other suitable clear material to an existing single glazed window in an existing dwelling to form a double glazed window.
Replace central electric resistive heating with HE central ducted gas	Space Heating & Cooling	Install a new high efficiency gas ducted heater to replace an existing central electric heater.
Install new HE room reverse-cycle air conditioner	Space Heating & Cooling	Install new high efficiency room reverse-cycle air conditioner (assuming displacing existing room RCAC)
Replace & upgrade ducting for existing gas ducted heater	Space Heating & Cooling	Remove old ductwork from an existing gas ducted heating system, and replaced with well-sealed high quality ductwork with a minimum R-value of R1.5.
HE gas ducted replaces existing gas ducted heating	Space Heating & Cooling	Install a new high efficiency gas ducted heater to replace an existing gas ducted heater. Note that this is the additional cost of a 5 star unit so the model assumes the unit will be replaced.
Replace an existing shower rose with a low flow shower rose	Water Heating	Replace an existing unrated shower rose with a low flow shower rose (3 Star Water Efficiency Rating or AAA rating).
Electric storage HW replaced with gas storage HW	Water Heating	High efficiency 5.0 or 5.5 star gas storage water heater to replace existing electric storage water heater.

<sup>31</sup> Activity definitions sourced from the Essential Services Commission Victoria (<http://www.veet.vic.gov.au/Public/Public.aspx?id=VEETActivities>)

Measure Name <sup>31</sup>	End use	Description
Electric storage HW replaced with gas instantaneous HW	Water Heating	High efficiency 5.0 or 5.5 star gas instantaneous water heater to replace existing electric storage water heater.
Electric storage replaced with solar gas-boosted	Water Heating	Solar-gas water heater replaces existing electric heater.
Solar retrofit to existing electric storage	Water Heating	Solar retrofit for existing electric water heater.
Electric storage replaced with heat pump	Water Heating	Heat pump HW for existing electric water heater.
Existing gas storage WH replaced with solar gas-boosted	Water Heating	An existing gas water heater is replaced with a gas-boosted solar water heater.
Install a solar pre-heater on a natural gas HW heater	Water Heating	An approved solar pre-heater is fitted to an existing gas water heater.
Replace incandescent with CFL equivalent	Equipment & Appliances	Replace existing incandescent lamp with low energy alternative (CFL or LED)
Replace 50W QH with LED equivalent (direct replacement)	Equipment & Appliances	Existing 50 watt extra low voltage (ELV) halogen reflector lamp is replaced with a suitable ELV low energy alternative (LED).
Replace 50W QH with CFL equivalent (direct replacement)	Equipment & Appliances	Existing 50 watt extra low voltage (ELV) halogen reflector lamp is replaced with a suitable ELV low energy alternative (CFL).
Replace 50W QH with CFL equivalent (fitting change)	Equipment & Appliances	Low energy (CFL) down light fitting is installed in an existing home.
Retirement of Pre-96 refrigerators	Equipment & Appliances	Retire operating old (>15 years) refrigerator permanently from service and recycle. Applies to 1-door or 2-door refrigerators. The old fridge may possibly be replaced at the new fridge and so the energy saving is the difference between the energy used by the old fridge and the energy used by a replacement. The cost of any new fridge is not considered in the analysis.
Installation of standby power controller	Equipment & Appliances	Installation of 'smart power board' to control standby (and possibly active) power consumption for nests of computer and home entertainment equipment.
HE freezer purchase	Equipment & Appliances	Purchase and installation of high efficiency new vertical or chest freezer, with a total volume between 100 and 700 litres.
HE refrigerator purchase	Equipment & Appliances	Purchase and installation of high efficiency new refrigerator with a total volume between 100 and 700 litres.
HE heat pump clothes dryer purchase	Equipment & Appliances	Purchase of a high efficiency electric clothes dryer (at least 5-Stars for electric dryers) rather than a market average dryer.

Measure Name <sup>31</sup>	End use	Description
Installation of HE gas clothes dryer	Equipment & Appliances	Purchase of a high efficiency gas clothes dryer rather than a market average dryer.
HE television purchase	Equipment & Appliances	Purchase of a high efficiency television (at least 4-Stars) rather than a market average television.
HE dishwasher purchase	Equipment & Appliances	Purchase of a high efficiency dishwasher rather than a market average dishwasher.
HE clothes washer purchase	Equipment & Appliances	Purchase of a high efficiency clothes washer rather than a market average clothes washer.
HE pool pump	Equipment & Appliances	Purchase of a high efficiency pool pump rather than a market average pool pump.
Installation of n-home display	Other	Installation of real-time in-home display to change consumer behaviour - this could possibly be just electricity, or could cover both electricity and gas. Products which meet the minimum functionality specification are allocated a base level of savings. Companies with products they claim generate a higher level of savings need to submit an independent test report based on Australian field trials to justify a higher level of certificates.

## Appendix B – Summary of Modelling Approach

The pitt&sherry detailed energy baseline was summarised by fuel type end use categories and compared to the high level baseline to get fuel type deviation percentages. Significant deviations were present in the LPG and wood heating and electricity water heating categories. Each detailed “end use category + fuel type” was then adjusted by the corresponding fuel type deviation percentage, so summation of the detailed baseline agreed with the high level baseline. Energetics has assumed the high level pitt&sherry energy baseline is at a sufficient level of accuracy required for the modelling.

Electricity and mains gas prices are based on the mid range franchise pricing forecast completed by Energetics and includes pricing impacts from the proposed Carbon Pricing legislation plus national Renewable Energy Target schemes. Stationary LPG price forecasts are based on Energetics transport LPG prices and wood prices are based on \$200/tonne with a 2.5% p.a. price escalation. Bill cost associated with LPG and wood consumption is relatively small and therefore the accuracy with the associated pricing assumptions has been considered acceptable.

Commonwealth equipment and appliance stock share and penetration were used to build an equipment stock model for the ACT. Any gaps in the equipment stock model were calculated by reverse engineering the pitt&sherry detailed end use category energy baseline, using the Commonwealth appliance attributes and usage parameters, as well as general assumptions. A housing stock model was also generated which provided data on total household numbers, floor areas, house star ratings and insulation characteristics.

The measures calculated and used by the Victorian Energy Efficiency Target Scheme (VEET) were replicated for the ACT to reduce time and complexity and to provide consistency across the schemes to ease the transition towards a possible future national scheme. The VEET lifetime abatement figures and costs for measures were used for the ACT modelling with adjustments made where thought to be necessary.

The equipment stock model was used to calculate the current size of each measure (opportunity). The VEET assumptions for maximum annual uptake rates (as a percentage of opportunity size) were calculated and directly applied to the size of the ACT opportunities. This provided the maximum units assumed for each measure that could be implemented on an annual basis in the ACT. The uptake rates can be considered as a function of implementation complexity, market capacity to deliver and user acceptance.

Each measure was individually analysed drawing on the VEET calculations, figures and assumptions where appropriate and adjusting for ACT climate, housing stock characteristics, appliance energy share and appliance penetration where necessary. For each measure, the energy savings against each fuel type was calculated on a per unit basis. Energy savings are typically calculated as a weighted average calculation based on the equipment stock model and detailed end use energy consumption.



A program model was developed to analyse the outputs from individual measures in the context of a residential energy efficiency abatement program. The following parameters are entered into a model to set up the modelling.

- Program start year
- Program duration (years)
- Administration costs (% of measure cost)
- Incentive cap price (\$/tCO<sub>2</sub>-e)
- Incentive cap price fee (\$/tCO<sub>2</sub>-e)
- NPV discount rate (%)
- Number of years of bill energy savings to be included in the incentive (years)
- Energy savings degradation discount (% p.a.)
- Marginal cost of abatement limit for measures to be included in program (\$/tCO<sub>2</sub>-e)
- Program abatement target (ktCO<sub>2</sub>-e)

The energy savings outputs (MJ/unit p.a.), opportunity size and maximum uptake rates for each measure are fed into the program model. The VEET uptake percentage figures were entered into the program model to determine level of uptake associated with the capital cost that is covered by the householder incentive.

The program model calculates the following annual figures for each measure from 2011 to 2060:

- **Number of units implemented** – *a function of the maximum uptake rate, uptake rate associated with the cost covered by incentive and whether the opportunity size has been reached.*
- **Energy savings against fuel type** – *discounted by energy degradation factor*
- **Abatement factors** – *over 1 to 25 year lifetimes*
- **GHG savings (non deemed)** – *fuel type energy savings x emission factor*
- **GHG savings (deemed)** – *units implemented x average abatement factor*
- **Program costs** – *units implemented x cost per unit*
- **Bill cost savings** – *fuel type energy savings x energy price*
- **Incentive** – *lifetime abatement factor x cap price + n years of first year bill savings*
- **Present values** – *for costs and savings*

Each measure is summarised by calculating the following:

- NPV (\$)
- Total abatement (ktCO<sub>2</sub>-e)
- Marginal cost of abatement (\$/tCO<sub>2</sub>-e)
- Whether included in program as per the \$/tCO<sub>2</sub>-e limit set in the program setup

The entire program is summarised for all measures included showing NPV, total abatement and marginal cost of abatement.