ICRC

independent competition and regulatory commission

Draft Report

Electricity Feed-in Renewable Energy Premium: Determination of Premium Rate

Report 1 of 2010
February 2010

The Independent Competition and Regulatory Commission (the Commission) was established by the *Independent Competition and Regulatory Commission Act 1997* to determine prices for regulated industries, advise government about industry matters, advise on access to infrastructure and determine access disputes. The Commission also has responsibilities under the Act for determining competitive neutrality complaints and providing advice about other government-regulated activities. Under the *Utilities Act 2000,* the Commission also has responsibility for licensing utility services and ensuring compliance with licence conditions.

The Commission has one part-time Senior Commissioner, Paul Baxter.

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For further information on this investigation or any other matters of concern to the Commission, please contact the Commission on 6205 0799.

Foreword

The Minister for Energy has made a reference to the Independent Competition and Regulatory Commission (the Commission) to provide advice to assist with the determination of the premium rate to be paid for electricity generated under the provisions of the *Electricity Feed-in (Renewable Energy Premium) Act 2008* (the Electricity Feed-in Act). The Minister's reference, dated 30 October 2009, has been made under sections 15 and 16 of the *Independent Competition and Regulatory Commission Act 1997* (ICRC Act).

The Electricity Feed-in Act provides for payments from electricity retailers to 'occupiers' of premises with compliant renewable (solar and wind) electricity generators installed in residential and commercial premises and connected to the electricity network. These payments are made at a price known as the 'premium rate' for generators with a capacity of less than 10 kWh, and at 80% of the premium rate for generators with between 10 kWh and 30 kWh capacity.

The Commission has been asked to develop a model for determining the premium rate. The model provides guidance on the determination of the rate for the period from 1 July 2010 to 30 June 2011 and on a mechanism for annual adjustments of the rate for the following four years.

The Commission released an issues paper in November 2009 and received 14 submissions in response from a range of individuals, businesses and government agencies, as well as the Minister for the Environment, Climate Change and Water. The Commission has taken the submissions into account in preparing its draft recommendation on the premium rate.

The Commission welcomes comments on this draft report. Comments will be taken into account in the Commission's final report, which will be provided to the Minister in March 2010.

Paul Baxter
Senior Commissioner
February 2010

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1 Introduction

1.1 The Electricity Feed-in Act

1.1.1 Background

A large amount of greenhouse gas pollution is created by the burning of fossil fuels for energy generation. This pollution can be minimised by increasing the use of renewable forms of energy.

At present, renewable energy electricity generation is a relatively expensive alternative to coal-fired generation. Feed-in tariffs, which are currently in operation in more than 40 countries, provide an incentive for the take-up of renewable energy generation.

In December 2007, the ACT Government issued a discussion paper on the possible model for and operation of a feed-in tariff arrangement for the ACT. After public consultation, the government decided to adopt a feed-in scheme and gave effect to that decision through the *Electricity Feed-in (Renewable Energy Premium) Act 2008* (incorporating amendments made to the Act in 2009).[1] The purpose of the Electricity Feed-in Act is to provide the mechanisms required to encourage the take-up of renewable energy electricity generation. Specifically, it aims to:

- promote the generation of electricity from renewable energy sources
- reduce the ACT's contribution to human-induced climate change
- diversify the ACT energy supply
- reduce the ACT's vulnerability to long-term volatility in fossil fuel prices.

1.1.2 Details of the Act

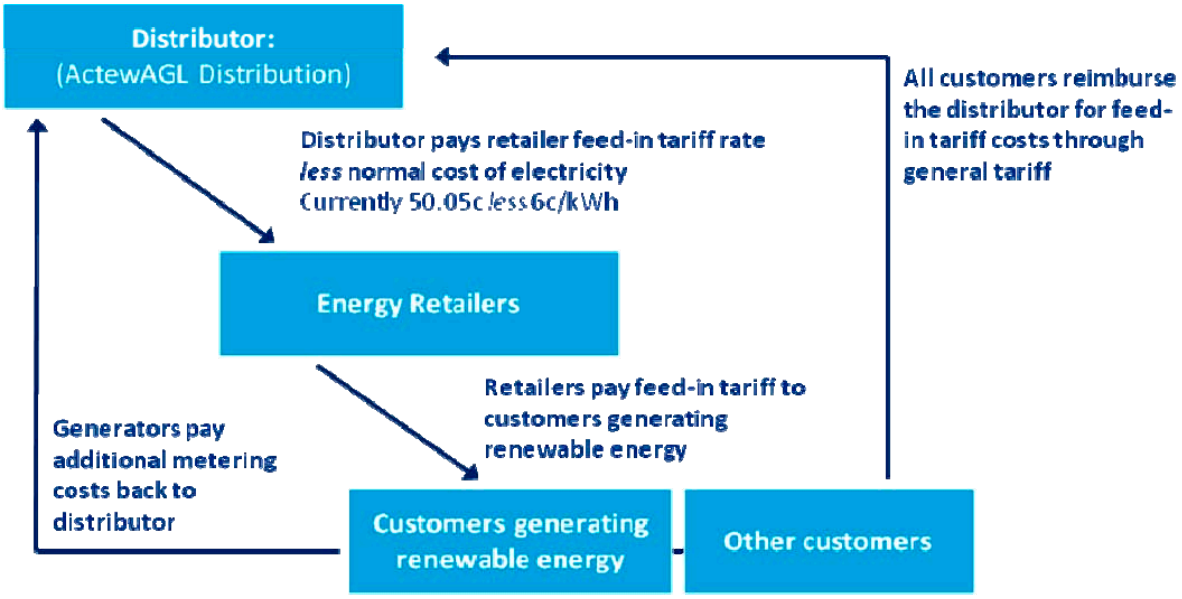
The Act provides a framework that enables capital investment in renewable energy electricity generation to be recouped by paying 'occupiers' a 'premium rate' for the gross amount of electricity they generate.[2]

The Act, which came into effect on 1 March 2009, requires electricity distributors (in the ACT, ActewAGL Distribution) to connect generators of renewable energy to the electricity network and to reimburse those generators' electricity suppliers (retailers) for the difference between the premium rate determined for renewable electricity and the normal cost of that electricity. The retailer is then required to pay the generator the premium rate (see Figure 1).

[1] The Act (as amended by the *Electricity Feed-in (Renewable Energy Premium) Amendment Act 2009)* is available at www.legislation.act.gov.au/a/2008-21/default.as.

[2] Under the legislation, payments are made to 'occupiers' of premises at which compliant renewable energy generators are installed. In most cases, the occupier will be the owner of the installation; however, to ensure consistency with the legislation, this report uses the term 'occupier' throughout.

Figure 1 Operation of the feed-in tariff scheme



The Act prescribes different rates of payment for electricity generated, according to the generator's capacity:

- generators of 10 kW or less receive 100% of the premium rate
- generators of between 10 kW and 30 kW receive 80% of the premium rate.[3]

Section 10 of the Act provides that the Minister must determine the premium rate each financial year. In February 2009, the Minister for Energy determined the premium rate to be 50.05c/kWh for the period from 1 March 2009 to 30 June 2010.[4] The Act also requires the Minister to seek the advice of the Commission to assist in the determination. The rate for 2010–11 will be determined by the Minister following receipt and consideration of the Commission's advice in this report. The rate must be determined no later than 31 March 2010.

The premium rate for the financial year that the generator is connected to the grid is payable (in nominal terms) for electricity generated by the generator for a period of 20 years after the date of connection, with payments made quarterly in arrears. Importantly, the premium rate at the time the contract was entered into will be paid for the full 20 years, regardless of any subsequent changes in the rate. Furthermore, the premium rate attaches to the occupier of the premises, and not to the original owner of the generator. Thus, if a property with a generator is sold two years after it is installed, the new occupier will be entitled to the feed-in tariff payments under the arrangements established through the Electricity Feed-in Act, but only for the remaining 18 years.

On current rates, the ACT scheme is the most generous in Australia. While the equivalent New South Wales scheme features a feed-in tariff of 60c/kWh, payments are made for only seven years, compared with 20 years in the ACT.

[3] The percentages can be varied by the Minister for Energy.
[4] Electricity Feed-in (Renewable Energy Premium) Rate Determination 2009 (No. 1) DI2009-22.

1.1.3 The Electricity Feed-in Code

The Electricity Feed-in Code, which supports the Act, was determined by the Commission in February 2009 under the *Utilities Act 2000*.[5] The code applies to electricity distributors and retailers, and sets out the practices and standards for the operation of the renewable energy feed-in scheme. The code details the obligations of electricity distributors and retailers to each other and to generators of renewable electricity under the scheme.

The code also requires distributors and retailers to report quarterly to the Commission. Distributors are required to report:

- the numbers of connection applications, new connections and total connections
- the total installed capacity and total metered output.

Retailers are required to report:

- the number of customers receiving a feed-in tariff
- the total premium tariff paid out.

1.2 Terms of reference

The Commission's full terms of reference are set out in Appendix 1. In summary, the Commission has been provided with a reference under section 15 of the ICRC Act to develop a model for determining the premium rate for the feed-in tariff to apply for the period from 1 July 2010 to 30 June 2011, and a mechanism to adjust the rate for the following four years. In doing so, the Commission is required to give priority to the following:

- the desirability of costs under the Electricity Feed-in Act impacting equitably on all electricity users
- the need to encourage the generation of electricity from renewable sources
- the need to reduce emissions from greenhouse gases
- the need to reduce the likely effects of climate change
- the desirability of occupiers being able to recoup investments in renewable energy generators within a reasonable time.

The Commission is also required to have regard to:

- the amounts payable under the Act by an electricity distributor or an electricity supplier
- additional metering costs passed on to an occupier because of the installation of the generation equipment.

The amounts payable under the Act by an electricity supplier take into account the arrangement through which the 'normal cost of electricity'—currently determined by the Minister to be 6c/kWh—is funded by retailers. That amount approximates the savings retailers are able to make by avoiding purchases of electricity from the National Electricity Market.[6]

[5] The Electricity Feed-in Code is available at www.legislation.act.gov.au/di/2009-23/default.asp.
[6] The Electricity Feed-in (Renewable Energy Premium) (Normal Cost of Electricity) Determination 2009 (No. 1) NI2009–83 is available at www.legislation.act.gov.au/ni/2009-83/default.asp.

The Commission has also been asked to identify other matters relevant to the determination of the premium rate. In doing so, the Commission has had regard to its objectives under section 20(2) of the ICRC Act. While those objectives specifically apply to price directions (rather than to references under section 15 of the Act), the Commission believes that several are particularly relevant to this review, including:

(f) the principles of ecologically sustainable development mentioned in subsection (5)

(g) the social impacts of the decision

(j) the effect on general price inflation over the medium term.

The Commission also considers that it is relevant to have regard to the nature of the gross feed-in tariff scheme that was announced on 10 November 2009 by the New South Wales Government.

1.3 Issues paper

The Commission released an issues paper on 23 November 2009. The paper included discussion of:

- the Electricity Feed-in Act and other initiatives in the ACT to reduce carbon emissions
- gross feed-in tariffs in other jurisdictions
- some of the key issues associated with the determination of the premium rate
- the model that may be used to amend the premium rate in future years.

1.4 Timeline

The Commission intends to follow the timeline below for the investigation.

Activity	Date
Release of issues paper and call for submissions	23 November 2009
Submissions closed	23 December 2009
Release of draft report with a further call for submissions	4 February 2010
Submissions close	4 March 2010
Final report to be released	15 March 2010
The Minister to provide the final report to members of the Legislative Assembly	17 March 2010
The Minister to determine the 2010–11 premium rate	31 March 2010

1.5 Making a submission on this draft report

Submissions may be mailed to the Commission at:

The Independent Competition and Regulatory Commission
GPO Box 296
CANBERRA CITY ACT 2601

Alternatively, submissions may be emailed to the Commission at icrc@act.gov.au.

Submissions should be provided by 4 March 2010.

The secretariat may be contacted at the above addresses, by telephone on 6205 0799, or by fax on 6207 5887. The Commission's website is at www.icrc.act.gov.au.

1.6 Structure of the draft report

This draft report is structured as follows:

- Chapter 2 provides an executive summary of this draft report.
- Chapter 3 provides further background to the Act and the operation of the feed-in tariff scheme to date.
- Chapter 4 provides an overview of responses to the Commission's issues paper.
- Chapter 5 discusses key issues that will affect the level of the premium rate, and the position adopted by the Commission on those issues.
- Chapter 6 outlines the results of the Commission's modelling and its recommendation regarding the feed-in tariff.
- Chapter 7 discusses the model to be used to determine the premium rate from 2011–12 to 2014–15.
- Appendix 1 reproduces the terms of reference.
- Appendix 2 lists abbreviations and acronyms.

2 Executive summary

2.1 Key issues and approach

In order to respond to its terms of reference to provide advice to the Minister on the ACT feed-in tariff in 2010–11, the Commission has, among other things:

- reviewed feed-in tariff arrangements in other jurisdictions
- considered the variety of other schemes, including those available from the Australian Government, that encourage the production and use of renewable energy
- made a number of assumptions about the costs and financial benefits of renewable generation in the ACT, based in many cases on advice from stakeholders
- modelled a number of different scenarios, including projections of price, take-up and the implications for electricity tariffs and greenhouse gas reductions.

2.2 Draft recommendation on feed-in tariff

A decision on the level of the feed-in tariff involves a trade-off between the premium rate, the level of greenhouse gas reductions and the impact on customers' electricity bills.

Having considered the matter, the Commission's draft position is that it is appropriate to set the premium rate at the minimum amount that is required to provide sufficient incentive to make the installation of renewable generation attractive against other similar risk-free investments, but which minimises the impact on the rest of the economy, including those who choose not to, or cannot, invest in renewable generation for financial or technical reasons.

This approach of not overcompensating the occupier is important because, despite the benefits of the feed-in tariff scheme, the scheme is a relatively costly way of reducing greenhouse gas emissions. As the ACT Government has noted in relation to the potential expansion of the scheme, the cost of abatement is in the range of $195 to $434 per tonne, which is significantly higher than the (untested) modelling of the Australian Government's Carbon Pollution Reduction Scheme package, which was based on $23 per tonne. It is also more expensive than directly purchasing green energy—for example, ActewAGL promotes 100% green energy for approximately 7.5c/kWh, or an abatement cost of $70 per tonne.

The Commission's calculations suggest that, based on current circumstances in the market, including available Australian Government incentives and the renewable energy certificate (REC) price, a 20-year premium rate of 50.05c/kWh provides a relatively risk-free return to investors that is higher than is necessary to attract new investment in this technology, particularly for systems with capacities of 1.5 kW or less. To demonstrate this point: the payback period for an investor in a 1.5 kW system at the current premium rate is currently around seven years, and the overall nominal rate of return on the investment is 13% per annum.

The Commission's draft view is that a premium rate of 37c/kWh in 2010–11, which is expected to result in a 10-year payback period for a typical 1.5 kW generator, is appropriate because that rate:

- enables occupiers to recoup the cost of investment in renewable energy generation capacity within a reasonable time and at a nominal rate of return commensurate with comparable investments
- provides the ability to encourage the generation of electricity from renewable sources
- minimises the impact of costs on all electricity users
- makes a contribution towards reducing emissions of greenhouse gases and the impact of climate change in the ACT, but at the same time recognises that the feed-in tariff scheme cannot by itself resolve greenhouse gas or climate change problems.

Higher premium rates, including the current rate of 50.05c/kWh, would more strongly encourage the take-up of renewable energy generation and contribute to a reduction in greenhouse gases and the likely effects of climate change. However, with the current combination of incentives for renewable energy generation, a 50.05c/kWh or higher tariff presents a rate of return that the Commission considers is higher than is needed, and which will have a relatively greater impact on electricity bills and ultimately on economic activity in the ACT.

2.3 Draft recommendation on model for determining future tariffs

The Commission believes that the model used to determine the premium rate for the period from 2011–12 to 2014–15 should represent an appropriate trade-off between flexibility and certainty. Therefore:

- In the absence of significant reductions in financial incentives provided by other government schemes, including as a result of changes in the value of RECs, the premium rate should be set at the rate that provides a 10-year nominal undiscounted payback period for a 1.5 kW system.
- Where there are significant reductions in financial incentives provided by other government schemes, the payback period should be reviewed accordingly.
- The following modelling parameters should be used to determine the premium rate for 2010–11:
  - annual maintenance costs ($100 per annum)
  - annual average output per kilowatt of installed capacity (1,050 kWh will be produced for each 1 kW of installed capacity)
  - average degradation in output capacity over time (0.5%).
- The most recent estimate of the financial costs of installing renewable generation for modelling purposes should be based on multiple and verifiable installer quotes.
- Where a value for RECs needs to be adopted, the value at 1 January prior to the financial year for which the new rate is to be applied should be used.
- The premium tariff should be announced at least three months before the start of the relevant financial year.
- The model used to calculate the premium should be made publicly available after the announcement of the premium tariff.

The model would be administered by the Commission on an annual basis, and the results from the model together with the workings of the model and all data used would be made available to the Minister by no later than 15 March of each year. The Minister would then use discretion as to whether any adjustment in the premium rate should be applied and in so doing would make available all relevant data and calculations to the Legislative Assembly and the wider community.

The Minister would not be constrained to accept the outcome from the model, especially where any adjustment in the rate is relatively minor (thereby addressing the need for certainty while maintaining the option of having flexibility where that is required). However, in the spirit of the Act's requirements, the full release of the Commission's calculations would ensure that all interested parties would be aware of the outputs from the model and the inputs that have been used in the model for the year concerned.

At the next full review point (that is, prior to 2015–16), the Commission would be tasked to review the model and price determination arrangements in detail and provide appropriate advice to the Minister on how the rate might be set, and at what level, for the next five years.

3 Key background issues

This chapter provides further background on the feed-in tariff scheme and its operation to date.

3.1 ACT energy policy and other initiatives to reduce greenhouse gas

3.1.1 Weathering the Change—the ACT's Climate Change Strategy 2007–2025

The ACT Climate Change Strategy, which was released in 2007, provides an overview of climate change science, the predicted impacts on the ACT, and the government's approach in responding to climate change. The strategy has a target of reducing the ACT's overall emissions by 60% of 2000 levels by 2050. The milestone goal is to limit greenhouse gas emissions to 2000 levels by 2025.[7]

The first action plan of the strategy (2007–11) contains 43 individual action items falling under four key objectives:

1. Being smarter with our use of resources
2. Designing and planning our city to be more sustainable
3. Adapting to current and future climate change
4. Improving our understanding of climate change.

The introduction of a feed-in tariff for renewable energy generation was one of the action items under the 'Designing and planning our city to be more sustainable' objective.

3.1.2 ACT Draft Sustainable Energy Policy

In December 2009, the ACT Government issued its Draft Sustainable Energy Policy 2010–2020, which aims to deliver tangible outcomes consistent with the overall objective of contributing to the territory's carbon neutrality. The Draft Sustainable Energy Policy proposes that by 2020 the ACT should aim to achieve the following targets (reductions are relative to 2020 business-as-usual emissions levels):

- Energy efficiency measures will aim to reduce ACT greenhouse gas emissions by at least 10%.
- Increased distributed generation will aim to reduce ACT greenhouse gas emissions by 5%.
- Transport initiatives will aim to reduce ACT greenhouse gas emissions by up to 3%, representing a 10% reduction in transport-based emissions.
- Waste initiatives will aim to reduce ACT greenhouse gas emissions by up to 1%, representing a 25% reduction in waste-based emissions.
- The ACT Government will aim to be carbon neutral, reducing ACT greenhouse gas emissions by up to 5%.

[7] Department of the Environment, Climate Change, Energy and Water website: http://www.environment.act.gov.au/climate_change/weathering_the_change

- The ACT will aim to use renewable energy for at least 25% of all electricity consumption (with an interim target of 15% by 2012).
- Customer information and choice will be significantly enhanced.
- Low-income and vulnerable energy customers will be assisted.
- Energy supply will be secure, reliable and diverse.
- Clean job growth and industry development will be promoted in a diverse low-carbon economy.

The government is seeking input on the Draft Sustainable Energy Policy 2010–2020 by March 2010. The final Sustainable Energy Policy 2010–2020 is due for release in mid-2010.

3.1.3 Legislative Assembly review of climate change

In late 2008, the ACT Legislative Assembly formed the Standing Committee on Climate Change, Environment and Water to examine matters related to climate change policy and programs, water and energy policy and programs, the provision of water and energy services, conservation, the environment and ecological sustainability. Soon afterwards, the committee received terms of reference to undertake the Inquiry into ACT Greenhouse Gas Reduction Targets.

The inquiry, which is ongoing, released an interim report in October 2009. The report contained a number of recommendations for the ACT's approach to climate change, including that a Climate Change (Greenhouse Gas Emissions Reductions Target) Bill be introduced into the Legislative Assembly by June 2010. The committee recommended that the proposed Bill contain targets, including:

- for the ACT's per capita emissions to peak in 2013
- a 5% reduction in the ACT's overall emissions by 2015
- consideration of a 40% reduction in the ACT's overall emissions by 2020
- an 80% reduction in the ACT's overall emissions by 2050
- for the ACT Government to have zero net emissions from its own operations by 2015.[8]

The ACT Government announced its response to the interim report on 17 November 2009. In that response, the government supported the introduction before June 2010 of a Bill legislating emissions reduction targets and mandating the reporting of progress against those targets. The targets include:

- a zero net emissions target for the ACT by 2060
- for the ACT's per capita emissions to peak in 2013.[9]

Interim targets are expected to be announced in 2010.

[8] Standing Committee on Climate Change, Environment and Water, interim report: http://www.legassembly.act.gov.au/downloads/reports/CCEW02%20Green%20Gas%20revised%20inclu%20errata.pdf
[9] ACT Government response to interim report: http://www.legassembly.act.gov.au/downloads/reports/7th%20CCEW02%20Greeen%20Gas.pdf

3.1.4 Carbon Pollution Reduction Scheme

The Australian Government has committed to taking action, in concert with other countries, to reduce Australian greenhouse gas emissions. The primary policy lever chosen for emissions mitigation is an emissions trading scheme, the Carbon Pollution Reduction Scheme (CPRS).

The CPRS is a comprehensive 'cap and trade' emissions trading system that is intended to cover around 70% of Australia's emissions when it is introduced in 2011. It has been designed as a market-based measure aimed at delivering the cheapest possible greenhouse gas abatement.[10]

The CPRS legislative package was passed by the House of Representatives on 4 June 2009. However, on 13 August 2009, the Senate voted against the legislation. The government reintroduced the Bills in November 2009, but they were rejected by the Senate for the second time on 2 December 2009. Uncertainty therefore remains about the political fate of the CPRS. However, it is likely that a national emissions trading scheme will be part of the Australian policy landscape within the next three years.

Following the Copenhagen climate change discussions and accord, the Australian Government has recently confirmed its position on the CPRS.[11] The government has committed to an unconditional 5% reduction in emissions, with 15% and 25% targets conditional on the extent of action by other countries.

The introduction of emissions trading at a national level would significantly change, and probably limit, the role of climate change policy at the state and territory level. The Council of Australian Governments has agreed on a 'document of shared understanding' aimed at rationalising government programs in the interests of efficiency and effectiveness from a national perspective. States and territories have agreed to review their range of programs to ensure that they are complementary to the CPRS and do not operate to distort the price signals sent by emissions trading. In particular, the Ministerial Council on Energy is currently progressing work designed to lead to greater harmonisation of jurisdictional feed-in tariff schemes, and a policy position is due to be developed for consideration by mid-2010.

Under the proposed CPRS legislation, ACT emissions savings from the installation of photovoltaic (PV) systems would have qualified for renewable energy certificates (RECs). In the absence of a finalised national emissions trading scheme, the ACT Government has made submissions to the Australian Government seeking to ensure that emissions savings arising from ACT feed-in tariffs would count as additional savings, rather than be adopted as a 'business-as-usual' factor. This matter has not yet been resolved.

3.1.5 GreenPower Scheme

The GreenPower Scheme has been designed to increase the number of customers in the ACT who take up green power and the amount of green power purchased in the territory.

The scheme requires all electricity retailers licensed in the ACT to have access to a green energy product accredited through the National GreenPower Accreditation Program. Compliance with the scheme, which has been mandatory since 1 April 2009, requires electricity retailers to offer all classes of new and reconnecting customers access to an accredited green energy product. The

[10] For more information on the CPRS see: http://www.climatechange.gov.au/government/initiatives/cprs.aspx
[11] http://www.climatechange.gov.au/~/media/Files/minister/wong/2010/media-releases/january/mr20100127.ashx

GreenPower product must have a minimum of 10% accredited greenpower, calculated and applied as the equivalent percentage of the customer's electricity usage over a billing period or in some other manner permitted under the GreenPower Program.

3.1.6 The Solar Homes and Communities Plan

The Solar Homes and Communities Plan (SHCP) was an Australian Government program that encouraged the take-up of PV technology to generate electricity by providing rebates to homeowners who installed PV power systems. Grants were also available to community organisations that installed PV power systems for educational purposes. The objectives of the program were to:

- reduce greenhouse emissions
- assist in the development of the Australian PV industry
- increase public awareness of renewable energy.

The program began in 2000, offering $4,000 rebates for the installation of PV systems. In November 2007, the maximum rebate was increased to $8,000, resulting in a substantial increase in applications and the introduction of a means test of $100,000 per household. Grants were also available for extensions to existing systems.[12]

The scale of the rebate played a substantial role in generating demand for solar installations. Before the increase in the maximum rebate, applications for rebates had been averaging 150 per week across the country. In May 2008, this had increased to 420 per week, and 6,050 applications per week were being received by May 2009. In June 2009, the Australian Government ceased receiving new applications for grants, having committed $700 million to the program (four times its original commitment). However, a number of renewable energy generators currently being installed were the subject of applications before June 2009, so installation numbers in the ACT are still being strongly influenced by the $8,000 rebate.

3.1.7 Renewable Energy Target scheme / Solar Credits

The SHCP was replaced by the Renewable Energy Target (RET) scheme, which provides a market for renewable energy generation in the form of RECs. Solar Credits are a mechanism inside the RET scheme to encourage small-scale renewable energy generation by multiplying the number of RECs received by eligible small-scale solar, wind and hydroelectric systems installed after 9 June 2009. Solar credits are applied to the first 1.5 kW of capacity of eligible systems.[13]

Owners of a solar micro generation scheme can choose to create and sell the RECs themselves, although the installer of the system will usually offer a discount on the installation of the system in exchange for the RECs. The value of that discount varies, depending on the prevailing REC price. For a 1.5 kW system at a $33 REC price (November 2009), an eligible system in the ACT would be entitled to 155 RECs, with a value of $5,115.

[12] Australian Government Department of the Environment, Water, Heritage and the Arts: http://www.environment.gov.au/settlements/renewable/pv/history.html
[13] http://www.environment.gov.au/settlements/renewable/pv/faqs.html#programs

The level of support under the Solar Credits scheme is scheduled to be phased back. The Solar Credits multiplier will be five until June 2013, after which it will decrease each year. There will be no Solar Credits multiplier from June 2015.[14]

The SHCP and the RET / Solar Credits schemes' objectives are closely aligned with the objectives of a feed-in tariff. Rebates have the effect of lowering the initial cost of installing a PV system, while the premium rate paid for the electricity generated by the system provides a return on that initial investment.

3.1.8 Green Loans

The Green Loans Program, an Australian Government initiative, provides subsidised loans for the installation of solar, water-saving and energy efficiency products. The program, which began on 1 July 2009, consists of two components:

- a Home Sustainability Assessment
- access to a Green Loans subsidy, which covers the interest on borrowings of up to $10,000 for a period of four years.

The program is means tested at $250,000 per annum, and only the actions recommended in the Home Sustainability Assessment are covered by the loan. Green Loans can be used in conjunction with other Commonwealth and state/territory incentives and therefore may be used to install renewable generation capacity that is eligible to receive the feed-in tariff.

3.1.9 ACT Greenhouse Gas Abatement Scheme

The ACT's Greenhouse Gas Abatement Scheme (GGAS), which is modelled closely on the equivalent New South Wales scheme, has been in operation since 2005. GGAS imposes mandatory greenhouse gas benchmarks on electricity retailers in the ACT, as well as on other participants. The scheme sets a greenhouse gas benchmark expressed in tonnes of carbon dioxide equivalent (t CO_2-e) per capita. The benchmark was lowered from the 2005 level of 7.96 t CO_2-e per capita to 7.27 tonnes per capita in 2007, and will remain at that level until 2020.[15]

The scheme is overseen by the Commission, which sets the total annual amount of greenhouse gas emissions allowable for the consumption of electricity in the ACT, based on the ACT's population. Retailers and other participants are each allocated a proportion of this amount, referred to as a benchmark. They are required to reduce their level of greenhouse gas emissions by offsetting any emissions in excess of the benchmark.

GGAS participants submit an audited Greenhouse Gas Benchmark Statement to the Commission in March each year, and the Commission confirms whether or not the participant has achieved its benchmark. If a participant has failed to achieve its benchmark, a penalty of $12.00/t CO_2-e is applied to the shortfall.

[14] http://www.energymatters.com.au/government-rebates/solar-credits-australia.php
[15] Commission website: http://www.icrc.act.gov.au/actgreenhousegasabatementscheme

3.1.10 National Capital to Solar Capital Discussion Paper—options for an expanded ACT Electricity Feed-in Tariff Scheme

In December 2009, the ACT Government issued a discussion paper examining whether, and on what basis, participation in the existing feed-in tariff should be opened to generators with a capacity of greater than 30 kW.[16] The discussion paper assesses the potential benefits and risks of expanding the scheme; potential expansion models; the effectiveness of the scheme as a lever to attract solar investment; and the impact of an expansion on consumers, including low-income and disadvantaged consumers.

Two key elements are highlighted in the discussion paper:

- A formally mandated cap of some form is to be embedded in legislation as an appropriate mechanism to maintain investor certainty and encourage larger scale development.
- In recognition of economies of scale, the premium rate applicable to commercial-scale facilities should be less than the current 80% rate offered for facilities with capacities between 10 kW and 30 kW.

In addition to focusing on generators greater than 30 kW, the discussion paper examines the potential for the scheme to include the following classes of non-participants:

- occupiers of rental properties (private or public)
- occupiers of properties that are unsuitable for viable renewable generation for reasons including block orientation, dwelling size, shading, aesthetic considerations or structural integrity
- government agencies and business enterprises.

The discussion paper also provides estimates of the potential employment creation effects of an expanded feed-in tariff scheme. These estimates are provided for discussion purposes, and consider both the short term and longer term effects of the feed-in tariff scheme on job creation in the ACT

Submissions on the discussion paper close on 28 February 2010.

3.2 Feed-in tariff schemes in other jurisdictions

Feed-in tariff schemes operate in Victoria, South Australia, Queensland, New South Wales and the Northern Territory; a scheme is due to commence in Western Australia on 1 July 2010.

The rate and design of feed-in tariff schemes are specific to local conditions, including the price of non-renewable energy, the cost of installing renewable energy systems and the energy output obtainable from those systems.

New South Wales and the ACT operate gross feed-in tariff models, in which generators are paid for each kilowatt of energy generated. Other Australian jurisdictions have adopted net feed-in tariff models, in which payments are based on energy generated less on-site use. Table 1 summarises jurisdictional arrangements.

[16] The discussion paper may be downloaded at http://www.environment.act.gov.au/__data/assets/pdf_file/0006/174795/Electricity_Feed-in_tariff_WEB.pdf#Discussion%20Paper

Table 1 Feed-in tariff arrangements in Australian jurisdictions

State	Current status	Nature of scheme	Rate	Duration
ACT	Commenced 1 March 2009	Gross	50.05c per kWh	20 years
NSW	Commenced 1 January 2010	Gross	60c per kWh	7 years
Vic.	Commenced 1 November 2009	Net	60c per kWh	15 years
Qld	Commenced 1 July 2008	Net	44c per kWh	20 years (subject to review)
WA	Commencing 1 July 2010	Net	To be determined (submissions closed on 20 November 2009)	To be determined
SA	Commenced 1 July 2008	Net	44c per kWh	20 years
NT	Commenced 1 July 2009 in Alice Springs only	Net	45.76c per kWh. (capped at $5 per day, then reverts to 23.11c per kWh)	To be determined

The South Australian and New South Wales schemes provide some guidance to the Commission in relation to the ACT and are useful to consider in more detail.

3.2.1 The South Australian scheme

The South Australian feed-in tariff scheme was the first in Australia. It commenced on 1 July 2008, at which time there were approximately 1,500 renewable generators in the state. The scheme provides for a net feed-in tariff of 44c/kWh, which is approximately twice the cost of energy in South Australia. Payments apply for 20 years.

The average size of renewable generators in South Australia is 1.6 kW, producing around 2000 kWh, half of which is typically net of consumption. Financial benefits to owners are therefore approximately $440 in feed-in tariff payments, plus a reduction in bills by around $200. This results in a payback period of about seven years, which, as discussed in Section 5.4 below, is similar to the current ACT payback period for small generators.

There was rapid take-up in South Australia, and in the 15 months to October 2009 an additional 7,000 generators were added to the system. Before then, in May 2009, South Australia reached 10 MW of generation capacity, which triggered a review of the feed-in scheme. Terms of reference and the formal announcement of the review were released on 31 October 2009. A report to the government was due by the end of 2009 but has not yet been released.

3.2.2 The New South Wales scheme

The New South Wales feed-in tariff scheme has some similarities with the ACT's scheme (notably, the use of a gross feed-in tariff). In November 2009, the New South Wales Government announced the introduction of the scheme, the details of which are contained in the Electricity Supply Amendment (Solar Bonus Scheme) Bill 2009, which was recently introduced into the New South Wales Legislative Council. The proposed scheme features:

- a gross feed-in rate of 60c/kWh
- a cap on generating capacity of 10 kW
- a seven-year duration, beginning on 1 January 2010 and concluding on 31 December 2016.

The New South Wales Department of Industry and Investment expects that the average generator will be paid $1,496 per annum under the scheme (based on an average generation capacity of 2,500 kWh). The most that an individual generator could receive in one year under the scheme is $10,000, based on the expected electricity generation of a 10 kW system.[17]

Initial estimates suggest that approximately 10,000 New South Wales households are likely to install solar panels in the first year of the scheme, and over 60,000 units will be installed over the full seven years.[18] However, data on actual take-up is not yet available.

3.2.3 Overseas

Gross feed-in tariff systems operate in several European countries. The systems operating in Germany and Spain are considered among the most generous. The common aim of these systems is to increase the deployment of renewable energy sources by removing price barriers to their adoption. The design of the systems varies substantially according to local energy market conditions and local opportunities for renewable energy generation.

Germany: The German feed-in tariff scheme has been in operation since 1991 and is regarded as one of the most successful in the world. In Germany, feed-in tariff rates are differentiated according to the source of the renewable energy. Separate tariffs are determined for biogas, biomass, hydroelectric, geothermal, solar and wind energy sources. The tariff paid for solar generators varies between EUR 45.7c/kWh and EUR 57.4c/kWh, depending on the capacity of the system and other design features. The tariff is greater for generators that are attached to the roof of a building or structure and greater again for generators that are attached to another part of a building. In Germany, the feed-in tariff is paid for a period of 20 years.[19]

According to the ACT Department of Climate Change, new industries have emerged in Germany and 117,000 new jobs were created between 2004 and 2008. This has been directly attributed to Germany's Renewable Energy Sources Act, of which a solar feed-in tariff is a component.[20]

Spain: In Spain, the feed-in tariff system is established under Royal Decree 1578/2008. The rate paid for building integrated installations is EUR 34c/kWh for systems up to 20 kW and EUR 31c/kWh for systems with a generation capacity greater than 20 kW but less than 2 MW. Systems which are not integrated as part of a building are paid a rate of EUR 32c/kWh up to 10 MW capacity. There are separate feed-in rates for other forms of renewable energy, including wind, geothermal, waste combustion, biomass and biogas, as well as solar thermoelectric. Spain is also a substantial manufacturer of solar technology, exporting a large proportion of its production to Germany.[21]

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[17] New South Wales Department of Industry and Investment website: http://www.industry.nsw.gov.au/energy/sustainable/renewable/solar/solar-scheme.

[18] New South Wales Government website: http://more.nsw.gov.au/articles/nsw-solar-bonus-scheme.

[19] Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (Germany), Renewable Energy Sources Act (2004), available at http://www.bmu.de/files/pdfs/allgemein/application/pdf/eeg_en.pdf .

[20] ACT Department of the Environment, Climate Change, Energy and Water, *National Capital to Solar Capital Discussion Paper*, available at http://www.environment.act.gov.au/__data/assets/pdf_file/0006/174795/Electricity_Feed-in_tariff_WEB.pdf#Discussion%20Paper.

[21] Royal decree number 1578/2008, available at http://www.glin.gov/view.action?glinID=216478.

Slovenia: Slovenia has a proposed feed-in tariff scheme, the details of which are currently being reviewed by the European Union. The proposed scheme is one of the most complex, with tariffs differentiated according to the source of the renewable energy and whether the generator is attached to a building or ground mounted, as well as by generation capacity. Proposed Slovenian tariffs differentiate between four levels of energy generation capacity:

- micro <50 kW
- small 50–1,000 kW
- medium 1–10 MW
- large 10–125 MW.

Proposed tariffs for solar generators (micro) vary between EUR 39c/kWh and EUR 47.8c/kWh, with the higher rate proposed for building-integrated systems. Contracts are proposed to last for 15 years.[22]

3.3 The ACT scheme to date

3.3.1 Take-up

Between 2000 and 2007, prior to the introduction of the feed-in tariff scheme, just 136 renewable energy generators were installed in the ACT.[23] However, following the initial announcement of the concept of a feed-in tariff for the ACT in November 2007, combined with the Commonwealth SHCP scheme, 383 new installations occurred between November 2007 and February 2009.[24] This growth has accelerated since the commencement of the feed-in tariff scheme. ActewAGL Distribution reports that there were 1280 renewable generators connected to the ACT distribution grid by the end of December 2009. The total generating capacity at 31 December 2009 was 2.73 MW, meaning that the average capacity of installed units was approximately 2.1 kW. All generators eligible to receive the feed-in tariff are solar: no wind generators have yet been installed.

Scheme take-up is summarised in Table 2 and the figures below.

[22] http://www.wind-works.org/FeedLaws/Slovenia/SloveniatoLaunchesSophisticatedSystemof%20Feed-inTariffs.html.
[23] ACT Department of the Environment, Climate Change, Energy and Water, *National Capital to Solar Capital Discussion Paper*.
[24] ibid.

Table 2 Renewable generation in the ACT

	Pre-scheme	June quarter[a]	September quarter	December quarter[b]
No. of renewable generation units[3]	568	731	905	1,280
No. of new units installed		163	191	375
No. of units receiving feed-in tariff		541	661	877
No. of applications for installation		247	187	458
Total supply capacity (W)[c]		1,559,042	1,918,647	2,731,665
Total output from renewable generation units (kWh)[c]		221,446	293,345	581,140
Total feed-in tariff premiums paid ($)		103,060	148,320	312,933
kWh generated by units receiving feed-in tariff[d]		205,914	296,344	625,241

a June quarter is for a 4-month period (1 March to 30 June 2010).

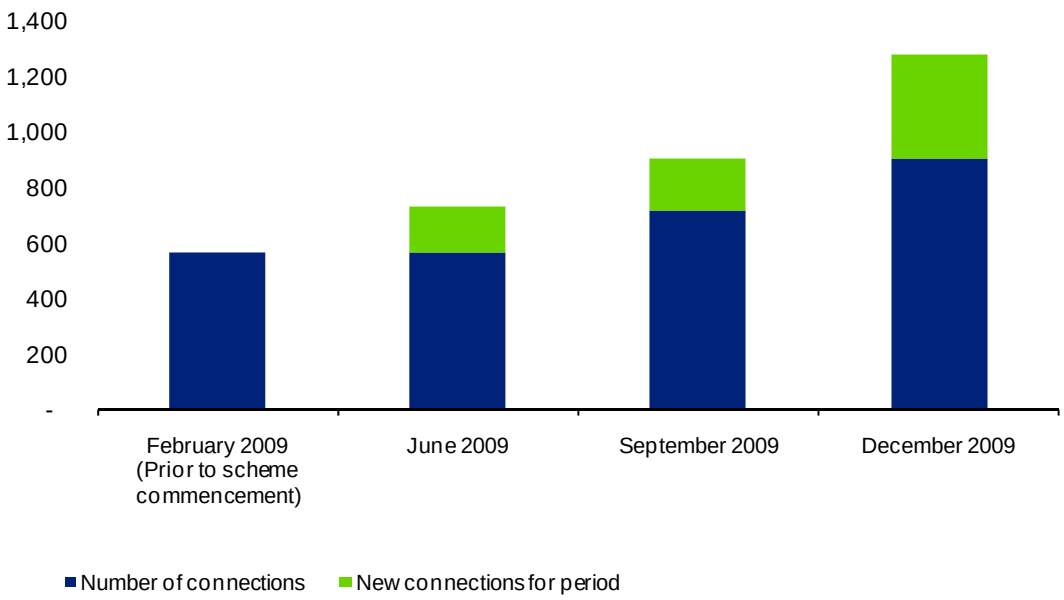
b December quarter figures for premium paid include an estimate for one retailer, as data had not been received at the time of this report.

c Includes generators in place prior to the commencement of the feed-in tariff scheme, which are not eligible to receive the feed-in tariff.

d Assumes all units are receiving 50.05c/kWh. In fact, some will only be receiving 40.04c/kWh, meaning that the figures in this row will be slightly understated. Also, it should be noted that there is a lag, associated with the billing cycle, between output and payment of the tariff.

Figure 2 illustrates growth in the number of solar installations since the scheme's commencement in March 2009. It is also clear from Table 2 that interest in installing generation units is still strong: applications for installations in the December quarter were greater than in the March and June quarters combined.

Figure 2 Number of renewable generation installations in the ACT



The total amount of electricity generated by renewable generators increased substantially in the December quarter as more units came on line and seasonal weather conditions (including the number of daylight hours) improved.

3.3.2 The effect of other incentives on take-up

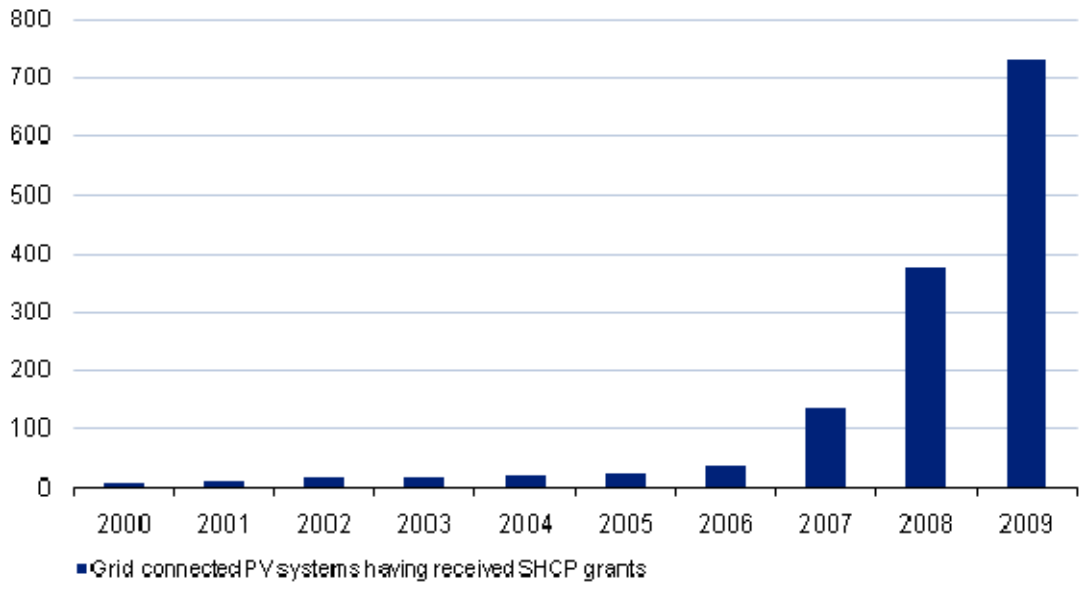
Information available to the Commission shows that the vast majority of generators installed to date have benefited from other incentive programs, such as the SHCP, Solar Credits or Green Loans programs. Therefore, not all of the recent increase in PV connections can be attributed solely to the existence of the feed-in tariff scheme.

For example, the SHCP program has clearly had a significant effect on take-up (see Figure 3). By December 2009, 930 grid-connected systems in the ACT (equivalent to 72% of total ACT connections) had received SHCP rebates.[25] SHCP grants, despite ceasing in June 2009, are still having an ongoing effect on connections: of the 375 new connections in the December quarter, just under 200 received an SHCP grant, meaning that owners had made investment decisions and applied to install units sometime prior to June 2009—and possibly before the commencement of the feed-in tariff scheme.

Installers of renewable generation units have also suggested to the Commission that there has been strong interest in the Green Loans program, which was only introduced in June 2009. The existence of this program may partly explain the strong increase in installation applications received during the December quarter.

The SHCP program's replacement with the less financially generous REC / Solar Credits programs will have an effect on future take-up, although that effect is hard to quantify.

Figure 3 ACT grid connections receiving SHCP program grants



3.4 Environmental and other impacts to date

The feed-in tariff scheme contributes to greenhouse gas emissions savings by directly substituting renewable generation for coal-based generation. Because renewable generators feed directly into

[25] SHCP program statistics: http://www.environment.gov.au/sustainability/renewable/pv/history.html.

local electricity grids, energy losses associated with transmitting energy over long distances from the generation site to the end user are also avoided.

From 1 March 2009 to 31 December 2009, 1,095,931 kWh of electricity was generated by renewable generators in the ACT (including those installed prior to commencement of the scheme). This equates to a direct reduction in greenhouse gas emissions of approximately 1,203 tonnes, using an emission coefficient of 1.076 kilograms per kWh[26] and assuming savings of 2% through avoidance of transmission line losses.

The feed-in scheme is still in its early days, so benefits to date are still modest. Savings of 1,203 tonnes are small compared with the ACT's total estimated annual greenhouse gas emissions of 4 million tonnes.[27]

In the short term, the feed-in tariff scheme will create jobs in the solar power sector. These will primarily be in the sale, supply, installation and connection of systems, although some will potentially be created in public administration; energy distribution and retail; education and training; and the component import and distribution areas. PV panels are currently imported from overseas, so there will not be any impact on manufacturing employment. The Alternative Technologies Association has provided data to suggest that if 1,000 generation units are installed per year (which is approximately the current rate) then 25–30 jobs installing the units will be created and sustained[28]. However, if households make expenditures on solar panel installations by substituting away from alternative investments on their houses or consumption of other goods and services, then the overall effect of the feed-in scheme on employment is indeterminate.

[26] As adopted in ACT Department of the Environment, Climate Change, Energy and Water, *National Capital to Solar Capital Discussion Paper*.
[27] ACT Government, *Draft Sustainable Energy Policy 2010–2020*, December 2009, p. 3.
[28] Discussions between the Alternative Technologies Association and the Commission's consultants, including correspondence provided by Craig Memery, Energy Advocate, ATA, dated 18 January 2010

4 Submissions on the issues paper

In November 2009, the Commission released an issues paper setting out some of the key matters for consideration in determining the premium rate. In response to the issues paper, the Commission received a total of 14 submissions from:

- the ACT Civil and Administrative Tribunal (ACAT), formerly the Energy and Water Consumer Council
- ActewAGL
- AGL
- the ACT Chief Minister's Department
- D G Jones
- the Department of Treasury (ACT)
- the Department of Housing and Community Services ACT
- Etienne Hingee
- G Hutchison
- K Wilkinson
- Origin Energy
- P Campbell
- R Neilson
- the Minister for the Environment, Climate Change, Energy and Water.

4.1 Issues raised in the submissions

The 14 submissions presented a diverse range of views on the matters contained in the issues paper. A high-level summary of the submissions, grouped by issue, is below. More specific discussion of some of the issues raised is set out in chapters 5 and 6. Copies of the submissions can be found on the Commission's website.

4.1.1 The applicability of overseas examples

Several submissions commented on the validity of using overseas examples to inform the determination of the premium feed-in tariff rate for the ACT. The general view was that the rate for the ACT needed to reflect conditions specific to the territory and that overseas examples were of limited value.

For example, Origin Energy stated that 'the relevance of other jurisdictions (particularly overseas jurisdictions), while instructive, is not always meaningful in the Australian energy market and solar resource context.'[29]

[29] Origin Energy, submission on issues paper, p. 1.

4.1.2 The cost of investment in renewable energy

The Commission sought comment on the cost of investment in renewable energy, in particular on whether the rate of the feed-in tariff should take into account subsidies provided by other policies. The Commission received a range of views on this matter.

The majority of submissions favoured including any other rebates (Solar Credits, RECs etc.) when assessing the overall costs to consumers of investing in renewable energy, as rebates are an important part of the investment decision.

ActewAGL drew attention to the increased purchase price for renewable energy generation due to the restructuring of Australian Government rebates and to the possible need to adjust the premium feed-in tariff to meet government objectives.[30]

AGL, in its submission, expressed the view that 'the ACT gross feed-in tariff should be the sole policy incentive for small scale renewable energy generation and eligibility of such technologies should be transitioned out of the RET scheme.'[31]

4.1.3 The payback period and the use of discount rates

The submissions received by the Commission contained a number of views on the appropriate length of the payback period and the use of discount rates in determining the premium feed-in tariff rate. Generally, the suggested payback period was around 10 years and the use of a discount rate was not favoured.

The Department of Treasury's submission favoured the use of a 20-year payback period, aligned with the length of the scheme and using a discount rate equal to the after-tax risk-free rate. Treasury stated that this rate is appropriate because:

- 'the risk-free rate means that the producer retains the risk—a higher rate would shift the cost of risk on to consumers
- the 'after-tax' rate prevents distorting investment choices as a result of different tax treatments'.[32]

4.1.4 Alignment with the New South Wales scheme

The Commission sought views on the benefits of aligning the ACT premium feed-in tariff rate with the rate in the New South Wales scheme (the only other Australian scheme with a gross tariff).

Origin Energy highlighted in its submission that this approach may not be appropriate given the difference between the periods covered by the New South Wales scheme (seven years) and the ACT scheme (20 years).[33] This view was expressed in a number of other submissions.

[30] ActewAGL, submission on issues paper, p. 2.
[31] AGL, submission on issues paper, p. 2.
[32] Department of Treasury (ACT), submission on issues paper, pp. 2–3.
[33] Origin Energy, submission on issues paper, p. 6.

4.1.5 Equity considerations

One of the most common issues raised in the submissions was the effect that an increase in electricity prices, due to the introduction of the premium feed-in tariff, would have on electricity consumers in general. A commonly expressed concern was that the well-off would be the ones most likely to invest in renewable energy generators and that the resulting electricity price increases would have a negative effect on low-income earners.

On this matter, ACAT commented that 'the feed-in tariff, in the form adopted by the ACT, is highly inequitable' and that 'the scheme design provides significant financial benefits to the wealthy investors in FIT capacity and passes the cost equally to all customers, including low income customers who have no financial capacity to make such an investment.'[34] ACAT noted that a high take-up rate for renewable energy generation would increase the inequity of the scheme and recommended that the scheme design be 'varied to exempt energy concession customers from the cost of the scheme'.[35]

G Hutchison, the occupier of premises with a PV system, also expressed a concern that the feed-in tariff scheme 'would be subsidised by those who cannot afford it'.[36]

The Department of Housing and Community Services ACT submission expressed a preference for mitigating these effects by 'maintaining the comparative value of the energy concession, through measures such as linking the concession cap to the transitional franchise tariff would assist low income households, but it would also increase the cost of concessions for the Government.'[37]

4.1.6 The level of the premium feed-in tariff rate

The Commission asked for comment on the level at which the feed-in tariff ought to be set for 2010–11. Several submissions suggested a specific rate, while others highlighted factors that ought to be taken into account in setting the rate.

Suggestions included that the tariff should be set at:

- the current rate of 50.05c/kWh[38]
- twice the retail rate (equivalent to 27.72c/kWh in 2009–10).[39]

4.1.7 The need for policy certainty

A number of the submissions raised the need for policy certainty as a specific factor that the Commission should take into account in determining the premium feed-in tariff rate.

For example, Origin Energy expressed the view that the Commission should:

- avoid significant changes to the scheme at this early stage in order to preserve certainty for customers who have already invested and those considering investment in renewable energy generation

[34] ACAT, submission on issues paper, p. 1.
[35] ACAT, submission on issues paper, p. 2.
[36] G Hutchison, submission on issues paper, p. 2.
[37] Department of Housing and Community Services ACT, submission on issues paper, p. 1.
[38] P Campbell, submission on issues paper, p. 1.
[39] G Hutchison, submission on issues paper, p. 5.

- also avoid significant changes in order to minimise the risk of 'boom and bust' cycles that some renewable energy policies have created in various Australian jurisdictions.[40]

4.2 Other issues raised

Submissions also raised a number of additional issues, including:

- the uncertainty about tax issues (in particular, GST arrangements) for occupiers with small-scale generators
- the exclusion of owners who do not occupy their properties from access to the scheme[41]
- that the REC system provided by the Commonwealth reduces the effectiveness of the feed-in tariff in its goal of reducing emissions in the ACT[42]
- that the gradual implementation of different feed-in tariff schemes in each state may be creating confusion and adding to the costs of the schemes.[43]

These matters are outside the Commission's terms of reference.

A small number of other submissions also questioned whether the feed-in scheme should proceed at all; again, this is not a matter for the Commission's consideration.

4.3 Submission from the Minister for the Environment, Climate Change, Energy and Water

The Commission received a submission on its issues paper from Simon Corbell MLA in his capacity as the Minister for the Environment, Climate Change, Energy and Water. The submission noted that:

- in contrast to the wording used in the issues paper, the current premium price of 50.05c/kWh is not a 'transitional rate' and will be the prevailing rate until a contrary rate is determined by the Minister
- if the premium price, fairly set upon economic grounds, adversely affects the financial situation of low-income or disadvantaged households, that is a separate issue which the government has other avenues for addressing, for example through the current review of the Energy Concession under the Community Service Obligation (CSO) regime.[44]

The Commission has been issued terms of reference for this inquiry by the Minister, and is required to consider matters under those terms. The terms of reference place the consideration of the premium rate in the context of the Act; accordingly, the Commission will consider the aims and objectives of the Act when formulating its advice on the premium rate. The Commission notes that it has made recommendations elsewhere[45] on the need for government subsidies to relevant households to be adjusted to reflect movements in the retail price of electricity. The government

[40] Origin Energy, submission on issues paper, p. 3.
[41] R Neilson, submission on issues paper, p. 1.
[42] ActewAGL, submission on issues paper, p. 2.
[43] Origin Energy, submission on issues paper, p. 5.
[44] Minister for the Environment, Climate Change, Energy and Water, submission on issues paper, p. 1.
[45] ICRC, *Final Decision—Retail Tariffs for Non-Contestable Electricity Customers 2009–10*.

has indicated its intention to adopt that recommendation, and it is in this context that the impact of the feed-in tariff scheme on individual households will be addressed.

In these circumstances, the Commission has considered that the Minister's submission should be treated as a further interpretation of the original terms of reference issued to the Commission and will conduct this review accordingly.

5 Issues in modelling and determining the level of the feed-in tariff

This chapter discusses a number of issues that need to be considered when modelling the feed-in tariff.

5.1 Impacts of the scheme

The feed-in tariff scheme will have three key impacts on the economy as a whole:

- The *cost of the scheme*, which is ultimately funded by electricity customers, will be determined primarily by the total output of small-scale generation schemes, multiplied by the feed-in tariff rate (other administrative and transactional costs will also be incurred).
- The *reduction in greenhouse gas emissions* will be determined by the number of systems installed and the average power output of those systems.
- The *impact on jobs in the ACT* will primarily be determined by the number of systems installed.[46]

The key to the scheme is of course the feed-in tariff rate, as in addition to directly determining the cost of the scheme, it is a key determinant of the number of systems installed and their size.

5.2 Key considerations for setting the feed-in tariff rate

In considering the premium rate, the Commission's terms of reference require it to give priority to:

- the desirability of costs under the Act impacting equitably on all electricity users
- the need to encourage the generation of electricity from renewable sources
- the need to reduce emissions from greenhouse gases
- the need to reduce the likely effects of climate change
- the desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time.

The Commission considers that there are two elements to the first point, which concerns the scheme affecting all electricity users 'equitably'. One element is in relation to the manner in which costs are passed through to electricity users. This is in effect mandated by section 8A of the Act, which requires that costs must be imposed on an electricity consumer in a way that is in proportion to the amount of electricity used by the consumer. The second element relates to the total quantum of costs imposed by the scheme (that is, by those who install renewable generation) on those electricity customers who choose not to, or are unable to, install renewable generation. Such costs would be passed on through higher electricity bills. This will ultimately depend on take-up of the

[46] The impact on the number of jobs created is subject to some conjecture especially in circumstances where any 'jobs' created in the solar energy sector may simply reflect a transfer of jobs from other sectors in the ACT as a consequence of households substituting expenditure on solar installations for other goods and services. The Commission has not sought to model this effect.

scheme, which in turn will be influenced by the premium rate. The matter of increases in bills is discussed further below.

The need to encourage the generation of electricity from renewable sources, the need to reduce emissions of greenhouse gases and the need to reduce the likely effects of climate change can be assessed jointly. The last two are consequences of the first and will be determined by the level of take-up of the scheme.

The primary driver of the level of take-up is likely to be the degree to which occupiers can recoup the cost of their investment, although it is not the only driver—other reasons for installing renewable generation include improved security of supply or a desire to improve environmental outcomes despite financial cost. The existence of small-scale generation units prior to the introduction of recent national and state-based incentive schemes is evidence of this. Furthermore, almost one million Australian customers have shown themselves willing to pay extra costs for their electricity by purchasing green energy. Nevertheless, the recent significant increase in installations of small-scale renewable generation has occurred after the introduction of programs that significantly reduce outlays and/or enable occupiers to make a positive financial return on their investments in those generation systems. The Commission therefore considers it reasonable to assume that financial considerations are a key driver in decisions to invest in renewable generation facilities.

The desirability of being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time has therefore been the focus of the Commission's modelling. It is affected by a range of factors, the most important ones being:

- the availability and value of other incentives
- the time over which the cost of the investment is recouped (the payback period)
- the average amount of electricity generated
- the cost of installing and operating renewable energy generators
- forecasts of take-up.

These and other related issues are discussed below. Some are relevant to the calculation of feed-in tariffs for 2010–11, while others are relevant to the calculation of feed-in tariffs in future years.

5.3 The feed-in tariff and other incentives for renewable generation

As discussed above, other than the feed-in tariff, the key additional incentive arrangement that currently applies in the ACT is the Australian Government's RET / Solar Credits scheme. Other schemes have previously been in place (notably, the Commonwealth's SHCP, which is still influencing new installations), and amended or new arrangements may apply in future.

In the issues paper, the Commission raised the question of whether the calculation of the premium rate should take into account other rebates and income that might accrue from having a renewable generation unit. Respondents were generally of the view that this should be the case and that ignoring other arrangements would not allow a complete picture of the impact of the scheme and consumers' decision-making frameworks to be formed.

The Commission broadly agrees that it is appropriate to have regard to the impact of other schemes as well as other relevant factors, such as the current price of RECs. Therefore, the modelling and analysis in Chapter 6 concerning the proposed 2010–11 premium rate reflects the current Commonwealth scheme, including current REC prices.

However, while it is important to take such other incentives into account, the Commission notes that in future years changes to the premium rate to compensate for changes in other schemes should not necessarily be automatic. This is discussed further in Chapter 7.

5.4 Renewable energy certificate prices

The value of RECs is determined by a combination of government policy and market forces. Demand for RECs is created by a legal obligation placed on retailers and large users of electricity. Supply of RECs is created by renewable energy generation units and is influenced by the Solar Credits scheme, which provides a multiplier effect for small-scale systems until 1 July 2015.

The Australian Government is currently reviewing aspects of the RET scheme, including whether the total RET target should be increased to reflect RECs that are created but not backed by actual generation—such as small-scale units, for which five RECs are currently created when just one REC-equivalent of generation capacity is in place.

The combination of market forces and changes and potential changes to government policy has resulted in relatively volatile movements in the value of RECs. The spot price of RECs moved in a range between $28 and $53 in 2009, and is currently around $33.[47]

The value of RECs is significant compared to the net cost a consumer faces when installing a renewable energy generator. A 1.5 kW generation system is eligible to receive 155 RECs, the value of which during 2009 would have ranged between $4,300 and $8,200.

For the purposes of determining the premium rate, this draft report has adopted a $33 REC price. This figure will be reviewed for the purposes of the final report, based on the REC value in early March 2010.

5.5 The payback period and rate of return

Another key question is the appropriate length of the payback period for the installation of renewable energy generation units. Clearly, the shorter the payback period, the higher the premium rate will need to be and the greater the attractiveness of the feed-in scheme. In simple terms (assuming no discount rate), a five-year payback period will require a tariff that is double that for a 10-year payback period.

To the extent that the payback period is shorter than the length of time for which the feed-in tariff is received (20 years), this means that occupiers will earn a positive rate of return on their initial investment. The shorter the payback period, the higher the return at the end of 20 years. The two are closely related concepts: the shorter the payback period, the larger the rate of return. Consistent with the general approach in the industry, the Commission has chosen to focus predominantly on the concept of the payback period rather than the rate of return.

The Commission is required to give priority to the desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time. The Commission also notes that the Minister for Energy indicated earlier this year that 'payback times should be competitive with other investment options so that doing right by the environment is also the right financial choice.'[48]

[47] As cited by Next Generation Energy Services; see www.nges.com.au (accessed 13 January 2010).
[48] Speech to the Informa Conference on Decentralised Energy, 9 June 2009.

5.5.1 Defining the payback period

There are a number of ways in which a payback period can be defined, including:

- the length of time it takes to recoup the initial investment (in nominal dollars), assuming no discount rate is applied to future cash flows to reflect the time value of money
- the length of time it takes to recoup the initial investment (in real dollars), assuming no discount rate is applied
- the length of time it takes to recoup the initial investment in real terms, including the application of a discount rate to future cash flows to reflect the time value of money.

Of the submissions that commented on this matter, most suggested that it was simplest to consider the payback period in terms of undiscounted and nominal cash flows. The exception was the Department of Treasury's submission, which favoured the use of a 20-year payback period, aligned with the length of the scheme and using a discount rate equal to the after-tax risk-free rate. Treasury stated that this rate is appropriate because:

- the risk-free rate means that the producer retains the risk—a higher rate would shift the cost of risk on to consumers
- the after-tax rate avoids distorting investment choices because of different tax treatments.[49]

Having considered submissions on this matter, for the purposes of the modelling in Chapter 6 of this report the Commission has used the term 'payback period' to refer to the length of time it takes to recoup the initial investment in nominal dollars, assuming no discount rate is applied. In undertaking its analysis, the Commission has also paid close regard to the rate of return that various lengths of (nominal, undiscounted) payback period imply. This means that, although the Commission's focus is on the payback period rather than returns, its approach is consistent with the framework and concepts proposed by Treasury. As discussed in Chapter 6, the Commission supports the need to ensure that returns from the feed-in tariff scheme are consistent with those from similar investments.

As discussed below, it is appropriate to ignore the impact of tax when considering the payback period, as tax will not be payable on most installations.

5.5.2 What is an appropriate payback period?

In Germany, a 20-year period was adopted, while New South Wales has announced that under its proposed scheme the payback period will be approximately eight years (although payments under its scheme are proposed to apply only for a maximum of seven years).

In addition to the Department of Treasury (cited above), other respondents to the Commission's issues paper proposed a range of payback periods:

- ACAT proposed an undiscounted payback period of 10–15 years
- P Campbell proposed a payback period of 10 years
- G Hutchison suggested 8–10 years.

[49] Department of Treasury (ACT), submission on issues paper, pp. 2–3.

The Commission also notes that, in response to the ACT Government's 2007 discussion paper, submitters who commented on the payback period suggested a range from 5 to 15 years, with 10 years the most common suggestion.[50]

While the Commission has undertaken some research on this matter, there does not appear to be a consensus view on the appropriate payback period for government schemes of this nature. Furthermore, because payments are guaranteed for 20 years in this case, comparisons with examples in other areas are of limited value if they have different payback period.

Another important issue is that for a given premium rate the payback period will be significantly different for different occupiers, depending on the size of the installation. This is due to the impact of the RET / Solar Credits scheme and the fact that large generators receive only 80% of the premium rate. This is illustrated in Table 3, which calculates payback periods for various sizes of generators based on the current premium rate.

Table 3 Payback periods at current premium rate

Size of unit	<1.5 kW	2.5 kW	5 kW	15 kW	30 kW
Payback period (years)	7	10	12	15	16

While having regard to the larger generation sizes, in Chapter 6 the Commission has focused its modelling on financial outcomes for smaller sized generation units. There are a number of reasons for this. First, the vast majority of generation units installed in the ACT are under 2.5 kW capacity (physical roof-space limitations and the size of the upfront cost are two reasons for this). Second, larger installations (for example, those over 10 kW) are likely to be installed by commercial occupiers with access to capital, who may be making investment decisions based partly on commercial grounds (for example, to promote related products or to gain a marketing edge). The Commission does not consider that the premium rate should be designed around the size of the investment made by those customers. Indeed, such a design would result in investors in small-scale schemes being significantly overcompensated. Therefore, the Commission has examined most closely the financial outcomes for 1.5 kW and 2.5 kW systems.

5.6 Average energy output

Manufacturers and installers of small-scale generators often quote the level of energy output in terms of maximum daily output or peak capacity. In fact, the level of energy produced will vary between generators according to the amount of sunlight they are exposed to. Factors such as the pitch of the roof that the panels are installed on, the direction the panels face and the level of shading will affect the amount of energy produced. Seasonal variations are strong—in winter, when the days are shorter and there is less sunshine, the panels may produce less than half of their summer energy output.

The ACT feed-in tariff scheme has been in operation for less than a year, so the average annual energy output per kilowatt of installed capacity in the ACT is difficult to estimate. For the purposes of modelling, the Commission has assumed that 1,050 kWh will be produced per kilowatt of installed capacity.

[50] A copy of the discussion paper is available from the ACT Chief Minister's Department website: www.cmd.act.gov.au/__data/assets/pdf_file/0010/2044/feed-in_tariff.pdf

Although most solar systems can be expected to last for 25 years or more, the power output gradually diminishes over time. Consistent with advice from the Alternative Technologies Association, the Commission has assumed that energy output will reduce by 0.5% per year over the 20 years that tariff payments are available.

5.7 Direct costs and benefits to occupiers of installing renewable energy generation units

5.7.1 Costs

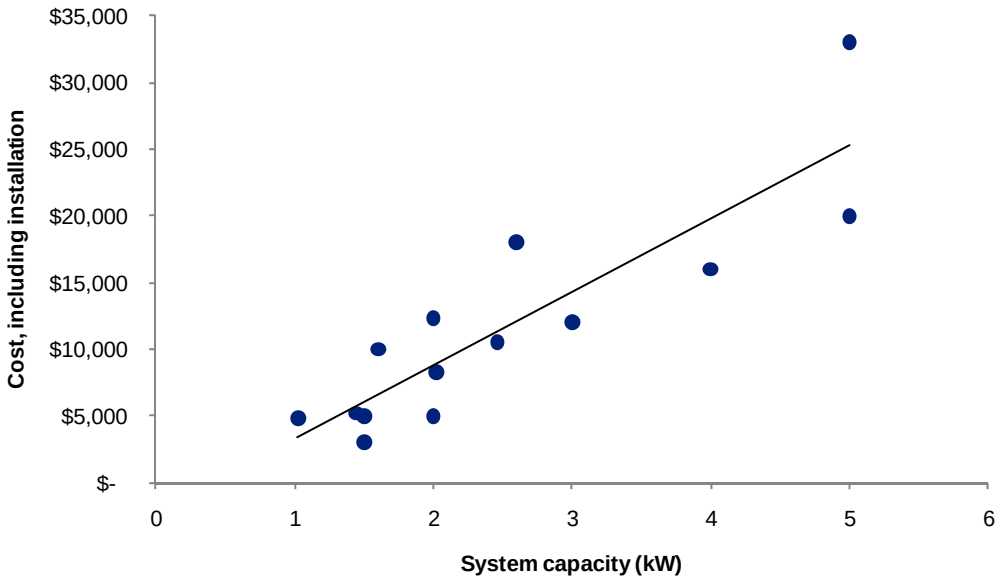
System costs

While the running costs of PV systems are low, installation costs are significant. To estimate the average cost of system installation, the Commission obtained a number of quotes from ACT installers. The quotes were augmented by evidence of actual installation costs provided by submitters. It must be noted that actual costs may vary due to location-specific factors. This is particularly the case for larger generation units.

In general, the gross costs increase relatively linearly with increased system capacity (see Figure 4). However, because Solar Credits apply only to the first 1.5 kW of capacity, systems of that size and smaller are relatively cheaper on a net per kilowatt basis than larger systems.

As no wind-generation units have yet been installed in the ACT, the Commission has focused only on the cost of PV systems.

Figure 4 Quotes for PV system costs, including installation, value of RECs and Solar Credits



The Commission's initial estimate of the average gross and net costs of various sized systems in the ACT are shown in Table 4. The larger the system, the more uncertain the costs—larger systems can exhibit economies of scale, be customised to particular users' needs, and have other site-

specific issues. The Commission would welcome feedback on its cost estimates, particularly for larger systems.

Table 4 Average PV system costs in the ACT (including $162 metering installation cost)

System capacity (kW)	Gross system cost	No. of RECs available with Solar Credits	Value of RECs	Net consumer cost (inc. meter installation)
1.5	$9,501	155	$5,115	$4,548
2.5	$17,226	176	$5,808	$11,580
5	$34,452	228	$7,524	$27,090
15	$103,356	435	$14,355	$89,163
30	$206,712	746	$24,618	$182,256

Other costs

Occupiers are also responsible for ensuring that their meter boxes are able to accommodate the new metering arrangement. Once a system is installed, relatively little maintenance is required, although occasional cleaning will be needed. Depending on access to the unit, this may require professional assistance. For the purposes of modelling, the Commission has assumed an annual operating cost of $100 per unit.

5.7.2 Benefits

Financial

The sole source of financial benefit from micro generation is the payment of the premium feed-in tariff rate for all of the electricity produced by the system at a fixed rate per kilowatt for 20 years.

Non-financial

A number of submissions cited the altruistic contribution of installing renewable generation—notably, the personal satisfaction from renewable electricity generation and the knowledge of creating an environmental benefit.

5.8 Forecasting future take-up

Actual take-up will of course vary according to the level of the premium rate; however, there are a number of difficulties in forecasting take-up, even for a continuation of the current 50.05c/kWh premium rate. The scheme has been in place for only 10 months, so data points are limited. Anecdotal feedback from the Alternative Technology Association indicates that customer awareness of the feed-in tariff scheme is still increasing. Furthermore, installation numbers are clearly being affected by changes to Australian Government incentive arrangements, plus the introduction of the Green Loans scheme in mid-2009.

Estimating take-up at alternative premium rates is an even more difficult exercise.

An average of 73 new units have been installed per month since the commencement of the scheme. Renewable generation units in the ACT have an average capacity of 2.13 kW.[51] Assuming that this

[51] This average capacity includes units installed prior to the commencement of the scheme.

rate of take-up and average size continue, there will be 5,654 units by the end of 2014 with a total capacity of around 12 MW.

It is also worth noting that the take-up of the feed-in tariff scheme in the ACT is around 0.04% of the customer base per month, which is similar to the take-up in South Australia (around 0.06% of the customer base), where there is a similar payback period for small generators. The slightly higher take-up rate for the South Australian scheme may be due to its correlation with the most generous phase of the Australian Government's SHCP scheme.

A 12 MW take-up by the end of 2014 is lower than the estimate in the government's Phase 2 discussion paper, which suggests that around 27 MW will be in place in 2014. The Commission also notes that ActewAGL's distribution price submission to the Australian Energy Regulator (AER) appears to be based on an assumption that around 38 MW will be installed by that time. This highlights the uncertainty of forecasts at this early stage of the scheme.

Rather than attempt to specifically forecast take-up, the modelling in Chapter 6 considers each of the three potential take-up outcomes outlined above.

5.9 Other modelling issues

The Commission's modelling assumes that taxation is not payable on feed-in tariff income. Although this may not be the case for larger and commercial installations, the assumption is appropriate on the basis that most occupiers are likely to be householders for whom the scheme will be of a private nature and thus for whom expenditure and income is not assessable.

The Commission's modelling also assumes that future inflation will be 2.5% per year, the mid-point of the Reserve Bank target range.

The Commission is also required to have regard to:

- the amounts payable under the Electricity Feed-in Act by an electricity distributor or an electricity supplier
- additional metering costs passed on because of the installation of the generation equipment.

'Amounts payable under the Act' refers to the current arrangement, whereby 6c/kWh of the feed-in tariff is funded by retailers (referred to in the Act as the 'normal rate'). The amounts approximate the savings that retailers are able to make through avoiding purchases of electricity from the National Electricity Market (NEM). Where the costs of obtaining electricity from the NEM—which will include direct energy purchase costs, contracting costs, losses and green energy obligations (including the potential impact of the CPRS)—are higher than the premium rate, the retailer will be able to make an additional return. Where that is not the case, the retailer will be adversely affected; if the NEM price is significantly higher than the premium rate, that may endanger the financial health of retailers in the ACT.

The price of electricity in the NEM is volatile and, as discussed in the Commission's recent technical paper on franchise tariffs in the ACT, is a complex element to determine.[52] The approach to modelling wholesale markets and wholesale energy costs has been subject to significant debate. Reflecting the significance of this element for the electricity distribution and supply industry,

[52] ICRC, *Draft Technical Paper—Model for Determining the Energy Purchase Cost Component for the TFT*, 2 November 2009.

ActewAGL has requested that the 'normal rate' be linked to the transitional franchise tariff determination. However, without oversimplifying matters, given current market conditions the Commission does not consider that the assumed 6c/kWh purchase cost is inconsistent with the efficient operation of the feed-in tariff and the establishment of the 2010–11 premium rate. However, this matter will be further considered prior to the release of the final report on the feed-in tariff premium rate in mid-March 2010.

At the same time, and noting that it is not within the Commission's terms of reference, the Commission has noted anecdotal evidence from installers of renewable equipment that smaller energy retailers are finding the additional administrative burden of the feed-in tariff scheme a discouragement to retaining customers with renewable generation units. This appears to be borne out in supply statistics provided by the retailers.

In relation to metering costs, the Commission notes that ActewAGL Distribution may pass on the additional metering costs associated with the installation and operation of generation equipment. ActewAGL Distribution has set a charge of $162 in 2009–10. This cost has also been factored into the Commission's modelling through the assumed upfront installation cost.

6 Modelling the 2010–11 feed-in tariff

This chapter models a number of alternative values for the feed-in tariff and focuses on the ability of occupiers to recoup the cost of investment in renewable energy generation capacity. It then outlines the Commission's preferred option, including the impact of that option on greenhouse gas emissions and electricity prices.

6.1 The base case—maintaining the current level of the tariff

Using the modelling assumptions described in Chapter 5, the Commission has used the current premium feed-in tariff rate of 50.05c/kWh as the base case for modelling the average payback, nominal rate of return and nominal dollar return for a range of small system sizes (see Table 5).

Table 5 Outcomes for a 50.05 cent tariff

Installation size (kW)	1.5	2.5	5	15	30
Initial net investment (after RECs)	$4,548	$11,580	$27,090	$89,163	$182,256
Energy generated in year 1	1575 kWh	2625 kWh	5250 kWh	15750 kWh	31500 kWh
Feed-in tariff received in year 1	$788	$1,314	$2,628	$6,306	$12,613
Annual maintenance costs	$100	$100	$100	$100	$100
Payback period (years)	7	10	12	15	16
Nominal rate of return on investment	13%	8%	6%	3%	3%
Nominal $ return over 20 years	$7,876	$10,872	$20,433	$28,558	$55,804

6.1.1 Features of the current scheme

Payback period

As noted in Chapter 5, the payback period for small generators under the current scheme is short—around seven years. The payback period increases for larger systems, as the upfront subsidy for those systems is a smaller proportion of the total purchase price. The short payback period and high level of returns were noted in a number of submissions.

Returns

The modelling shows that, for a 1.5 kW system installed in 2009–10, the expected average annual nominal rate of return is 13%. Over the 20-year period, an occupier with a system of this size would earn a nominal dollar return of around $7,876 above the initial purchase price. The nominal return on larger systems is greater due to their larger energy output. An occupier with a 5 kW system could expect to earn an additional $20,433 above the purchase price of the system over the life of the scheme. The rate of return, however, is less for larger systems, due to the proportionally higher initial outlays associated with those systems.

The Act guarantees the premium feed-in tariff rate for a period of 20 years, making investment in energy generation a relatively risk-free proposition compared to alternative investment options. This is not to say that investing in renewable energy is risk free—for example, returns could be affected by equipment failure or damage, unforeseen weather, technological issues and future overshadowing by trees or property development. It is also true that if the original occupier sells a

property prior to the end of the 20-year period they will not receive the full 20 years of cash flows. While, at least in theory, the purchase price for the property will include a premium to reflect the remaining feed-in payments, it remains to be seen whether the real estate market will factor in the full value of those payments.

Nevertheless, a 13% nominal rate of return on a 1.5 kW system compares very favourably with other relatively low-risk investments. As a comparison, the returns on seven-year Australian Government bonds (the same length as the payback period for a 1.5 kW system) are just under 6%. A 12-month term deposit of $10,000 with a major Australian bank (where interest receipts are subject to tax) earns around 6%.

6.2 Alternative levels for the tariff

The Commission has also modelled the expected payback period and nominal returns expected for a range of other tariff rates. The rates modelled are:

- 60c/kWh: aligning with the New South Wales feed-in tariff rate
- 23.9c/kWh: the current rate required to achieve a nominal dollar payback on a 1.5 kW system after the 20 years of the scheme
- 28c/kWh: the rate required to achieve payback on a 1.5 kW system after 15 years
- 37c/kWh: the rate required to achieve payback on a 1.5 kW system after 10 years.

6.2.1 60c/kWh—aligning with the New South Wales feed-in tariff rate

Table 6 shows the modelling outcomes for a 60c/kWh premium rate.

Table 6 Outcomes for a 60 cent tariff

Installation size (kW)	1.5	2.5	5	15	30
Initial net investment (after RECs)	$4,548	$11,580	$27,090	$89,163	$182,256
Energy generated in year 1	1575 kWh	2625 kWh	5250 kWh	15750 kWh	31500 kWh
Feed-in tariff received in year 1	$945	$1,575	$3,150	$7,560	$15,120
Annual maintenance costs	$100	$100	$100	$100	$100
Payback period (years)	6	9	10	13	13
Nominal rate of return on investment	17%	10%	9%	5%	5%
Nominal $ return over 20 years	$10,866	$15,856	$30,401	$52,481	$103,651

As expected, a 60c/kWh premium feed-in tariff is more generous to occupiers than the current 50.05c/kWh rate. A 1.5 kW system could expect to receive a nominal dollar payback on initial investment of $4,548 in six years. Over the 20-year life of the scheme, a nominal return of $10,866 above the initial investment would be received, equivalent to an annual rate of return of 17%.

6.2.2 23.9c/kWh—payback on a 1.5 kW system after 20 years

The Act provides for payment of the premium feed-in tariff rate for a period of 20 years. A payback period of 20 years means that over the full life of the scheme the initial investment will be recovered in nominal terms, but no more. For a 1.5 kW system, the premium feed-in tariff that

results in a 20-year payback is 23.9c/kWh. The expected outcomes for a tariff at this rate are presented in Table 7.

Table 7 Outcomes for a 23.9 cent tariff

Installation size (kW)	1.5	2.5	5	15	30
Initial net investment (after RECs)	$4,548	$11,580	$27,090	$89,163	$182,256
Energy generated in year 1	1575 kWh	2625 kWh	5250 kWh	15750 kWh	31500 kWh
Feed-in tariff received in year 1	$376	$626	$1,252	$3,005	$6,009
Annual maintenance costs	$100	$100	$100	$100	$100
Payback period (years)	20	–	–	–	–
Nominal rate of return on investment	0%	–2%	–2%	–4%	–4%
Nominal $ return over 20 years	$0	–$2,254	–$5,819	–$34,448	–$70,208

A payback period of 20 years for a 1.5 kW system results in zero nominal return on investment. The 23.9c/kWh rate required to achieve this would result in negative financial returns for systems larger than 1.5 kW. While some people will install renewable energy generators for reasons other than financial gain, the terms of reference require the Commission to give consideration to the desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time. A 20-year payback for a 1.5 kW system and negative returns for larger systems do not appear to meet that criterion. The ability of a 23.9c/kWh tariff to encourage the take-up of renewable energy technologies, which in turn affects the effectiveness of the premium feed-in tariff in reducing greenhouse gases and reducing the likely effects of climate change, will be less than for the other options.

6.2.3 28c/kWh—payback on a 1.5 kW system after 15 years

A premium feed-in tariff of 28c/kWh is estimated to result in a payback period of 15 years for a 1.5 kW system. As noted, submissions received, as well as public consultation undertaken in 2007, favoured a payback period of between 10 to 15 years. A payback period of 15 years would allow an occupier to recoup the cost of the investment over the first 15 years of the scheme and receive payments beyond the initial investment cost for a further five years. The outcomes for a 28c/kWh premium feed-in tariff are shown in Table 8.

Table 8 Outcomes for a 28 cent tariff

Installation size (kW)	1.5	2.5	5	15	30
Initial net investment (after RECs)	$4,548	$11,580	$27,090	$89,163	$182,256
Energy generated in year 1	1575 kWh	2625 kWh	5250 kWh	15750 kWh	31500 kWh
Feed-in tariff received in year 1	$441	$735	$1,469	$3,526	$7,053
Annual maintenance costs	$100	$100	$100	$100	$100
Payback period (years)	15	–	–	–	–
Nominal rate of return on investment	3%	0%	–1%	–3%	–3%
Nominal $ return over 20 years	$1,244	–$180	–$1,671	–$24,492	–$50,296

This rate is expected to result in a 3% nominal rate of return for a 1.5 kW system and a $1,244 nominal dollar return over the 20-year period of the scheme. Renewable generators in the 2.5 kW

range would be close to cost neutral, with a small nominal loss over the investment period; larger generators produce negative returns.

A 3% nominal rate of return could be perceived as reasonable for a low-risk investment, but it is less than the government bond rate and investors do not recoup their initial investment for 15 years. Although 1.5 kW generators are representative of the typical generator being installed in the ACT, most larger generators have negative nominal returns and would be further discouraged from investing in renewable energy generation.

6.2.4 37c/kWh—payback on a 1.5 kW system after 10 years

A premium feed-in tariff of 37c/kWh is estimated to result in a payback period of 10 years for a 1.5 kW system. This payback period is the lower bound of the range of periods provided in the submissions, as well as in the public consultation undertaken in 2007. The outcomes for the 37c/kWh premium feed-in tariff are shown in Table 9.

Table 9 Outcomes for a 37 cent tariff

Installation size (kW)	1.5	2.5	5	15	30
Initial net investment (after RECs)	$4,548	$11,580	$27,090	$89,163	$182,256
Energy generated in year 1	1575 kWh	2625 kWh	5250 kWh	15750 kWh	31500 kWh
Feed-in tariff received in year 1	$583	$971	$1,942	$4,660	$9,321
Annual maintenance costs	$100	$100	$100	$100	$100
Payback period (years)	10	15	16	–	–
Nominal rate of return on investment	7%	3%	2%	0%	0%
Nominal $ return over 20 years	$3,950	$4,329	$7,346	–$2,852	–$7,015

A 37c/kWh premium feed-in tariff rate is expected to allow a 1.5 kW renewable generator to recoup its investment cost in 10 years and earn a nominal dollar return of $3,950 on the investment over the subsequent 10 years. This equates to an expected nominal rate of return of 7%, which is broadly comparable to other lower risk investments. The expected rates of return for 2.5 kW and 5 kW systems are lower, due to the proportionally lower upfront subsidies. With a 37c/kWh premium feed-in tariff, these systems are expected to earn nominal dollar returns of $4,329 and $7,346, respectively.

A 37c/kWh premium feed-in tariff provides a financial incentive for people to invest in renewable energy generation over other similar (low-risk) investments, which in turn will promote a reduction in greenhouse gases and a reduction in the likely effects of climate change.

The payback period for generators with more than 15 kW capacity under this model is just over 20 years, with an average annual return that is slightly negative.

6.3 Other effects of the premium feed-in rate

6.3.1 The effect on household electricity bills

The costs associated with the feed-in tariff scheme are passed on to all ACT electricity users. This additional cost consists of two components:

- a fixed cost to cover costs incurred by ActewAGL for network operations, meter inspection, depreciation and return on capital on metering assets
- a variable cost equal to the amount of electricity generated under the scheme, multiplied by the premium feed-in rate less the normal cost of electricity.

Fixed costs

The fixed costs for the feed-in tariff scheme were estimated in the AER's 2009 final determination on electricity distribution tariffs in the ACT, and are approximately as shown in Table 10.

Table 10 Feed-in tariff scheme fixed costs passed through to ACT electricity customers

	2009–10	2010–11	2011–12	2012–13	2013–14
Fixed costs (nominal $m)	0.44	0.55	0.66	0.74	0.82

Section 3.3 of this report discusses take-up of the scheme to date, and Section 5.7 identifies the issues associated with forecasting take-up due to changes in Commonwealth and territory subsidies and other factors. As indicated, it is difficult to accurately estimate future take-up at the current premium rate, let alone estimate changes that would occur due to different premium rates (that is, the elasticity of demand in response to the premium rate).

Therefore, rather than attempt to directly forecast take-up at alternative premium rates, the Commission has modelled three take-up scenarios and then assessed their implications for emissions and tariffs:

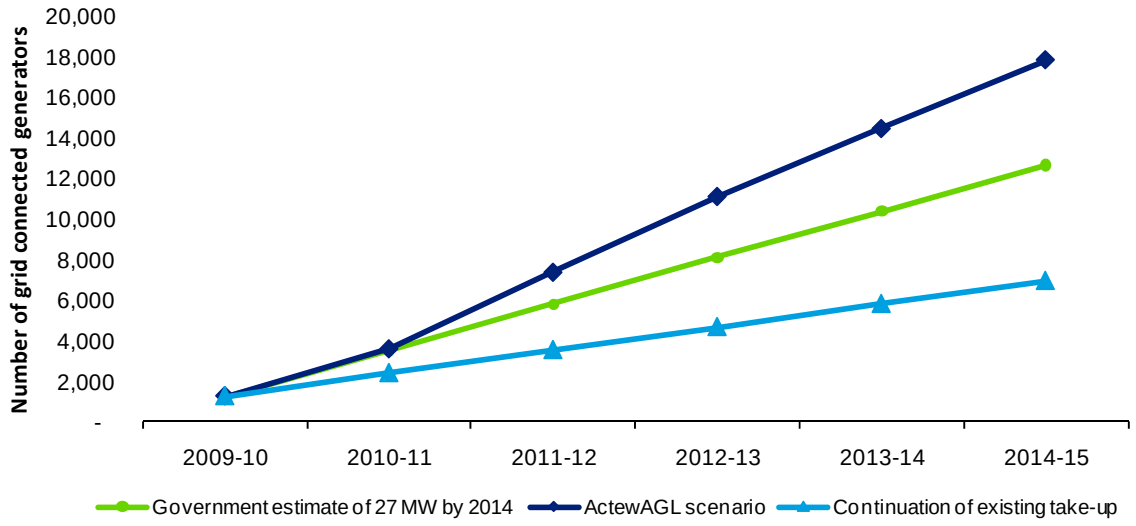
- Scenario 1—based on the ACT Government's forecast of scheme take-up, which expects a 27 MW capacity by the end of 2014[53]
- Scenario 2—broadly based on ActewAGL's submissions to the AER, which imply an estimated total generation capacity of around 38 MW in 2014
- Scenario 3—based on the number of new connections in the six months to December 2009 (566) continuing at a steady rate. The Commission has chosen this period because the first four months of the scheme are likely to be atypical due to relatively low public awareness, and because it understands that logistical problems resulted in a small backlog of installations during that time. This scenario results in installation capacity of approximately 12 MW by the end of 2014.

The estimated number of connections for each of the scenarios is shown in Figure 5. Under the three take-up scenarios, the number of grid-connected renewable energy generators moves from

[53] *National Capital to Solar Capital, Options for an expanded ACT Electricity Feed in Tariff Scheme*, http://www.environment.act.gov.au/__data/assets/pdf_file/0006/174795/Electricity_Feed-in_tariff_WEB.pdf#Discussion%20Paper

1,280 at the end of 2009–10 to 10,379, 14,461 and 5,808, respectively, by the end of 2013–14.

Figure 5 Potential feed-in tariff scheme take-up



To model the estimated effect on the average household electricity bill, the Commission has assumed that the size of the average generator remains constant at 2.13 kW and the average output remains at 1,050 kW per year per kilowatt of installed capacity. The estimated impacts of the scheme are shown for the 37c/kWh (Table 11) and 50.05c/kWh (Table 12) scenarios, assuming that the modelled rates apply to new installations for each year from 2010–11 to 2013–14. Note that in both scenarios a 50.05c/kWh premium rate applies in all years to installations made in 2009–10.

Table 11 Feed-in tariff scheme fixed costs passed through to ACT electricity customers (37c/kWh premium feed-in tariff rate)

	2009–10	2010–11	2011–12	2012–13	2013–14
Number of generators (mid-year)					
Scenario 1	1,280	3,555	5,830	8,104	10,379
Scenario 2	1,280	3,595	7,370	11,109	14,461
Scenario 3	1,280	2,412	3,544	4,676	5,808
Electricity generated (kWh)					
Scenario 1	2,867,734	7,964,187	13,060,640	18,157,094	23,253,547
Scenario 2	2,867,734	8,054,257	16,511,226	24,888,245	32,398,273
Scenario 3	2,867,734	5,403,886	7,940,038	10,476,190	13,012,342
Total scheme costs ($m)					
Scenario 1	$1.70	$3.40	$5.08	$6.74	$8.40
Scenario 2	$1.70	$3.42	$6.15	$8.82	$11.23
Scenario 3	$1.70	$2.60	$3.49	$4.36	$5.23
Increase to annual household bill ($)					
Scenario 1	$4.64	$9.32	$13.97	$18.66	$23.26
Scenario 2	$4.64	$9.39	$16.91	$24.44	$31.11
Scenario 3	$4.64	$7.14	$9.60	$12.07	$14.47
Increase to annual household bill (%)					
Scenario 1	0.33%	0.63%	0.90%	1.14%	1.36%
Scenario 2	0.33%	0.63%	1.09%	1.50%	1.82%
Scenario 3	0.33%	0.48%	0.62%	0.74%	0.85%

Table 12 Feed-in tariff scheme fixed costs passed through to ACT electricity customers (50.05c/kWh premium feed-in tariff rate)

	2009–10	2010–11	2011–12	2012–13	2013–14
Number of generators (mid-year)					
Scenario 1	1,280	3,555	5,830	8,104	10,379
Scenario 2	1,280	3,595	7,370	11,109	14,461
Scenario 3	1,280	2,412	3,544	4,676	5,808
Electricity generated (kWh)					
Scenario 1	2,867,734	7,964,187	13,060,640	18,157,094	23,253,547
Scenario 2	2,867,734	8,054,257	16,511,226	24,888,245	32,398,273
Scenario 3	2,867,734	5,403,886	7,940,038	10,476,190	13,012,342
Total scheme costs ($m)					
Scenario 1	$1.70	$4.06	$6.41	$8.74	$11.06
Scenario 2	$1.70	$4.10	$7.93	$11.70	$15.09
Scenario 3	$1.70	$2.93	$4.15	$5.35	$6.55
Increase to annual household bill ($)					
Scenario 1	$4.64	$11.14	$17.63	$24.19	$30.64
Scenario 2	$4.64	$11.25	$21.81	$32.40	$41.79
Scenario 3	$4.64	$8.05	$11.43	$14.82	$18.14
Increase to annual household bill (%)					
Scenario 1	0.33%	0.75%	1.14%	1.48%	1.79%
Scenario 2	0.33%	0.76%	1.40%	1.99%	2.44%
Scenario 3	0.33%	0.54%	0.74%	0.91%	1.06%

Under both the 50.05c/kWh and the 37c/kWh premium rates, the increase in bills by 2013–14 is relatively modest and will be in the range of 0.85–2.44%. Indeed, it is possible that if a 37c/kWh premium rate is adopted then installed generation might be even less than the 12 MW assumed in Scenario 3, which is based on the current take-up and premium rates. In that case, the impact of the scheme on bills (and greenhouse gas emissions and jobs, which are modelled below) will be more modest than is shown in the tables.

The difference between the impact on household bills under each scenario is proportional to the difference in the premium feed-in tariff.

6.3.2 The estimated effect on greenhouse gas reduction

The estimated effect on greenhouse gas reduction is a direct function of the amount of energy produced by renewable generators connected to the grid.

To calculate this reduction, the Commission has assumed that 1.076 kilograms of greenhouse gas production is avoided for every 1 kilowatt of electricity generated from renewable sources.

Table 13 Estimated effect on greenhouse gas reduction

Scenario	Greenhouse gas reductions (tonnes)				
	2009–10	2010–11	2011–12	2012–13	2013–14
Scenario 1	3,086	8,569	14,053	19,537	25,021
Scenario 2	3,086	8,666	17,766	26,780	34,861
Scenario 3	3,086	5,815	8,543	11,272	14,001

Table 13 shows total greenhouse gas reductions in 2013–14 of between 14,000 and 35,000 tonnes. Such reductions, while material, are small compared to overall ACT greenhouse gas emissions of 4 million tonnes per year. Phase 1 of the feed-in tariff scheme will necessarily be a small contributor to any territory-wide reductions in emissions.

6.3.3 The estimated effect on general price inflation and jobs

As noted in Section 3.4, and subject to households not simply substituting investment in renewable energy in place of other alternatives, the feed-in scheme will have a positive impact on jobs in the short to medium term. The Alternative Technologies Association has suggested that, if 1,000 generation units are installed per year (approximately equivalent to the current take-up rate—Scenario 3), 25–30 jobs will be created and sustained. Extrapolating, this means that under the high take-up option (Scenario 2) around 100–120 jobs will be created. These job creation figures are broadly consistent with modelling by the government of the potential impact of expanding the feed-in tariff scheme.

However, as the government's modelling indicates in its discussion paper on the possible expansion of the feed-in tariff scheme[54], in the longer term there will be an overall reduction in employment as a result of the feed-in tariff scheme due to the impact of the scheme on retail electricity tariffs. Over time, higher electricity costs will contribute to general price inflation and reduce disposable income levels, leading to diminished economic turnover, consumption and hence jobs. The government's modelling suggests that a scheme which results in a $50 increase in prices (that is, with take-up around 20% higher than the levels modelled in Scenario 3) would reduce employment by around 62 persons in the longer term (2020–2029).

6.4 Conclusions and draft recommendation on feed-in tariff

In considering a recommendation for the premium feed-in tariff rate, the Commission refers to the terms of reference, which require that priority be given to:

- the desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time
- the need to encourage the generation of electricity from renewable sources
- the desirability of costs under the Electricity Feed-in Act impacting equitably on all electricity users
- the need to reduce emissions from greenhouse gases
- the need to reduce the likely effects of climate change.

[54] ACT Department of the Environment, Climate Change, Energy and Water, *National Capital to Solar Capital Discussion Paper*.

The Commission has modelled a number of scenarios based on the outcomes of the scheme so far and on the input and information received from stakeholders. Based on that modelling and input, the Commission's consideration of the terms of reference is as set out in this section.

6.4.1 The desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time and the need to encourage the generation of electricity from renewable sources

The Commission has modelled a number of potential premium rate scenarios to ascertain the ability of occupiers to recoup the cost of their investment and therefore the level to which they are encouraged to install generation equipment. It is apparent that at the current premium rate of 50.05c/kWh, and given the current price of RECs and the Commonwealth's RET / Solar Credits scheme, installers of small generators are able to achieve a relatively early full recovery of their investment plus a rate of return on the investment that exceeds the risk-free market rate and the rate offered in other jurisdictions.

For a 1.5 kW installation, the payback period is around seven years and returns average 13% per annum over the 20 years of the scheme. This is much higher than alternative investment options with similar risk. Premium rates of more than 50.05c/kWh, such as the 60c/kWh in place in New South Wales, result in higher returns.

The Commission has also modelled a number of lower premium rates, including 37c/kWh. At that rate, there is a payback period of around 10 years and an average 7.3% annual return for 1.5 kW installations. While this rate is slightly higher than other comparative investment returns in the market, returns are lower for larger generation units (for example, 2.5% per annum for 5 kW units).

The Commission also notes that the attractiveness of investment in small renewable generation units is enhanced by the Australian Government's Green Loan scheme. While the effects of that scheme have not been explicitly modelled, it enables occupiers to reduce the impact of the relatively high upfront costs of the investment.

At tariff levels materially below 37c/kWh, returns are lower and payback periods are longer than those available through other investment options. The Commission is not convinced that a lower rate will provide sufficient incentive for an optimal level of investment in this form of renewable generation technology.

6.4.2 The desirability of costs under the Electricity Feed-in Act impacting equitably on all electricity users

As noted above, the Commission considers that there are two elements to the scheme impacting 'equitably' on all electricity users. One element is in relation to the manner in which costs are passed through to electricity users. This is in effect mandated by section 8A of the Act, which requires that costs must be imposed on an electricity consumer in a way that is in proportion to the amount of electricity used by the consumer.

The second element relates to the total quantum of costs, through higher electricity bills, imposed by the scheme (that is, by those who install renewable generation) on all electricity users, including those electricity customers who choose not to, or are unable to, install renewable generation.

In submissions made to the Commission, several respondents raised concerns about the impact that the scheme could have on electricity bills. In its issues paper, the Commission noted that it is likely that higher income households and homeowners are more likely to install the equipment and hence earn a financial reward, while lower income households and tenants are less likely to participate in the scheme and hence are likely to pay a financial penalty. This was also noted by several respondents.

Modelling of impacts on bills is difficult because overall take-up is uncertain and will continue to be heavily determined by external factors, such as the market rate of RECs and Australian Government programs. However, the Commission's modelling suggests that, based on current take-up rates, bill increases are likely to be modest (in the order of 1% of bills by 2013–14 at the current take-up and premium levels). Higher take-up rates, commensurate with those forecast by the government and ActewAGL, will increase bills by larger amounts but at this stage bill increases of more than 2.5% by 2013–14 due to the feed-in tariff appear unlikely. A 37c/kWh tariff will result in lower bill increases, particularly if a lower premium rate results in materially lower take-up levels.

Nevertheless, these relatively modest bill increases do not suggest that the feed-in tariff should be over-generous; nor do they mean it is appropriate to ignore the likely impacts of the scheme on other customers or the economy as a whole. Other emissions reduction approaches (for example, by consumers voluntarily choosing to purchase green energy) can reduce greenhouse gas output while having zero financial impact on those customers who choose not to take up those options.

The Commission notes that the government has indicated its intention to adopt a previous recommendation of the Commission—that the electricity CSO provided by the government to eligible low-income households be adjusted to take into account any changes in the retail price of electricity in future years, which will include the pass-through of the feed-in tariff costs.

6.4.3 The need to reduce emissions from greenhouse gases and the need to reduce the likely effects of climate change

The ACT Government has placed a strong policy priority on reducing emissions of greenhouse gases and the likely effects of climate change. Among other things, its Draft Sustainable Energy Policy proposes that by 2020 increased distributed generation will aim to reduce ACT greenhouse gas emissions by 5% relative to 2020 business-as-usual emissions levels. The feed-in tariff scheme will be a contributor to that target.

As with impacts on bills, at this early stage it is difficult to predict what level of reduction in greenhouse gases will occur as a result of the feed-in tariff scheme. It is even more difficult to predict the effect that a lower premium rate, such as 37c/kWh, might have on greenhouse gas emissions. The question for the Commission has been how to form a view on the elasticity of demand by consumers for zero-emissions generation technologies and systems in response to changes in the premium rate.

Using the AER's cost recovery estimates, the government has calculated that 107,402 tonnes of greenhouse gas emissions will be avoided over the first five years of the scheme, based on a 50.05c/kWh tariff.[55] Even this estimate of savings, which as discussed appears high at this time, is extremely modest compared to total annual ACT greenhouse gas emissions of 4 million tonnes.

[55] ACT Department of the Environment, Climate Change, Energy and Water, *National Capital to Solar Capital Discussion Paper*, p. 8.

Thus, as acknowledged by the government, the feed-in tariff scheme will only be a contributor to the reduction of greenhouse gases in the ACT. It cannot by itself resolve the greenhouse gas emissions problem. In this context, the government has noted that the feed-in tariff scheme is just one of a number of programs and policies which, combined, can make a material difference to ACT greenhouse gas emissions.

On the basis of current take-up rates, the contribution of the feed-in tariff scheme may be less than originally anticipated, particularly given the potential impact of changes in Australian Government programs that can directly influence consumer take-up of small zero-emissions generation systems. Therefore, the Commission is of the view that, while the reduction in the premium rate favoured in this draft report may reduce the current take-up rate for the feed-in tariff scheme, the overall impact on greenhouse gas emissions will be minor.

Thus, in meeting the overall requirements of the terms of reference, the Commission believes that the proposed reduced premium rate represents an appropriate balance of all the requirements of the Act and still results in a program that compares well with other, similar schemes across Australia. In terms of the publicly stated work plan of the Ministerial Council on Energy, on which Minister Corbell is the ACT Government's representative, the various jurisdictions across Australia are currently working towards a program that will seek to achieve greater harmony across the various jurisdictional feed-in tariff schemes that are operative. The reduced premium rate recommendation is consistent with that objective.

6.4.4 Conclusions

Ultimately, the Minister's decision on the feed-in tariff represents a trade-off between the premium rate, the level of greenhouse gas reductions and the impact on customers' electricity bills.

Having considered the matter, the Commission's draft position is that it is appropriate to set the premium rate at the minimum amount that is required to provide sufficient incentive to make the installation of renewable generation attractive against other, similar risk-free investments, but which minimises the impact on the rest of the economy, including those who choose not to, or cannot, invest in renewable generation for financial or technical reasons.

Not overcompensating the occupier is important because, despite the benefits of the feed-in tariff scheme, the scheme is a relatively costly way of reducing greenhouse gas. As the ACT Government has noted in relation to the potential expansion of the scheme, the cost of abatement is in the range of $195 to $434 per tonne, which is significantly higher than the (untested) modelling of the CPRS package, which was based on $23 per tonne. It is also more expensive than directly purchasing green energy; for example, ActewAGL promotes 100% green energy for approximately 7.5c/kWh, or an abatement cost of $70 per tonne.

The Commission's calculations suggest that, based on current circumstances in the market, including the available Australian Government incentives and the REC price, a 50.05c/kWh premium rate provides a relatively risk-free return on investment and is higher than is necessary to attract investment, particularly for 1.5 kW and smaller systems. The payback period at the current premium rate is currently around seven years.

The Commission's draft view is that a premium rate of 37c/kWh in 2010–11, which is expected to result in a 10-year payback period for a typical 1.5 kW generator, is appropriate because it:

- enables occupiers to be able to recoup the cost of investment in renewable energy generation capacity within a reasonable time
- provides the ability to encourage the generation of electricity from renewable sources
- minimises the impact of costs on all electricity users
- makes a contribution towards reducing emissions of greenhouse gases and the impact of climate change in the ACT, but at the same time recognises that the feed-in tariff scheme alone cannot resolve greenhouse gas and climate change problems.

The 37c/kWh option provides a strongly competitive investment option for those wishing to invest in renewable energy generation. A nominal rate of return of 7% is arguably slightly higher than that of other long-term, low-risk investment options. The Commission recognises that a higher return may be necessary to convince occupiers to make a significant initial capital outlay, but also that other opportunities exist for reducing the level of this outlay, including the Green Loans scheme.

Arguably, a premium feed-in tariff rate of 37c/kWh guaranteed for 20 years, although less than the current rate of 50.05c/kWh, would still result in the ACT having the most generous feed-in tariff scheme in Australia.

The Commission recognises that, given the relatively low economies of scale in small-scale solar energy production[56], combined with the incentive properties of the current RET / Solar Credits scheme and the fact that the premium rate is flat for up to 10 kW capacity, the financial incentives for the installation of units with capacity above 1.5 kW will be weaker under a 37c/kWh tariff than under a 50.05c/kWh tariff. To some extent, this is somewhat undesirable because it discourages the exploitation of whatever (small) economies of size exist. However, given the competing desire to not overcompensate occupiers with small units, relatively lower returns for larger systems are unavoidable.

Higher premium rates, including the current rate of 50.05c/kWh, would more strongly encourage the take-up of renewable energy generation and contribute to a reduction in greenhouse gases and the likely effects of climate change. However, with the current combination of incentives for renewable energy generation, a 50.05c/kWh or higher tariff would provide a rate of return to occupiers that the Commission considers is higher than is needed, and would have a relatively greater impact on electricity bills and ultimately on economic activity in the ACT.

[56] Large-scale systems, such as the proposed ACT solar power facility, will exhibit much stronger economies of scale.

7 The feed-in tariff in future periods

In Chapter 6, the Commission provided its draft view on the appropriate feed-in tariff for 2010–11. This was based on a number of assumptions about the cost of renewable generation, as well as the incentives provided by other schemes to encourage renewable generation.

The assumptions that are relevant to the calculation of the feed-in tariff in 2010–11 will change over time. For example, the cost of solar panels may fluctuate with exchange rates and technological development, and Australian Government incentive schemes may change.

In addition, after a few years the impact of the feed-in tariff scheme will become clearer. Installation trends will become clearer, as will output and the impact of the scheme on electricity prices.

Therefore, the appropriate feed-in tariff for 2010–11 is unlikely to be appropriate in future years. The Commission has been asked to provide guidance on a mechanism for annual adjustments of the premium rate for the four years following 2010–11.

7.1 Issues paper and responses

In the issues paper, the Commission suggested that any model to be used to determine the feed-in tariff in future years should:

- be, to the maximum extent possible, based on up-to-date, publicly available information that is rigorous, objective and verifiable
- be relatively simple, easy to understand and able to be audited
- be publicly available
- be consistent with the manner in which the premium rate is initially determined.

The Commission also specifically raised the question of whether the premium rate should be adjusted based on the outcomes of the feed-in tariff scheme to that time.

Several respondents made submissions in relation to the future determination of the feed-in tariff.

ACAT suggested that available data on the operation of the scheme should be considered, but with caution.

R Neilson stated that whatever model is used it should be simple and transparent and not subject to 'meddling'.

Origin Energy urged caution regarding frequent changes to the premium rate and noted that changes would add to administrative and compliance burdens. While Origin noted the flexibility of the ACT model (in being able to respond to changing market conditions), it indicated that frequent variation to the premium rate in one jurisdiction results in higher costs for national energy retailers.

7.2 Key issues

There are a number of key issues in setting the premium rate in future years, including the balance between flexibility and certainty and the need for simplicity and transparency.

7.2.1 Flexibility

Flexibility is needed to ensure that the premium rate reflects up-to-date information on such matters as the costs of renewable generation and the impact of other incentive schemes. Most respondents to the issues paper considered it essential that this be the case.

Clearly, if Australian Government incentives for renewable energy change materially and there is no change in the feed-in tariff, then potential investors in renewable generation may face either very high or very low returns from their investments. This would have the potential to create extremely high or low demand for renewable generation and could lead to a destabilising mini 'booms' or 'busts', in which markets become overheated or cold. Both outcomes are undesirable and in such circumstances it would be difficult for the Act to achieve its policy objectives, including the aim of promoting the generation of electricity from renewable energy sources. Flexibility provides greater opportunity for the scheme to achieve its objectives and avoid any unintended or unforeseen consequences.

However, a key matter is the degree of flexibility that should be provided. To take a hypothetical example, if the Australian Government were to remove the RET / Solar Credits scheme in 2011–12 the premium rate would need to approximately double to achieve the same payback period for a 1.5 kW installation. A sharp fall in value of RECs would have a similar impact. Therefore, automatically adjusting the premium rate to compensate for changes in other schemes and to achieve the same payback period would have a significant impact on electricity prices. It could also create a high level of volatility in the premium rate, which a number of submissions identified as undesirable. It would effectively mean that, in the example of the elimination of the RET / Solar Credits scheme, responsibility for funding the scheme in the ACT would transfer from the Australian Government to ACT electricity customers, which could result in significant welfare transfers.

Flexibility also increases the complexity and cost of annual tariff adjustments, and can mean that adjustment moves from being a relatively mechanistic process to one involving judgment and the need to forecast likely outcomes. The value of RECs is a case in point. While it is not possible to prevent their price fluctuating, the modelling assumption adopted may have a significant impact on the premium rate. The Commission considers that it would be useful to establish principles for determining the REC price to be used in the modelling. For example, the spot REC price at a particular date could be used as an input to the model.

7.2.2 Certainty

Certainty can take two forms. First, there is a need for certainty about the methodology and principles underlying the determination of the feed-in tariff. There is no reason why a high level of certainty about the approach for the four years should not be established. That approach should be the same as that used to set the 2010–11 premium rate. Furthermore, a number of the modelling parameters used to calculate the 2010–11 premium rate can easily be reproduced for future years.

As discussed in Chapter 6, the Commission considers that the premium rate should be determined using:

- a 10-year payback period for a 1.5 kW generation unit
- the most recent financial costs and benefits associated with renewable generation.

However, should the Minister determine that the 2010-11 premium rate should be based on a different model (for example, a different payback period), that model should become the basis for establishing the tariff in future.

Certainty about the level of the premium rate is a different matter. The Commission appreciates that, at least conceptually, it is generally undesirable for the premium rate to change rapidly from year to year. There are advantages in ensuring a relatively stable rate from both industry stakeholder and customer viewpoints. If the premium rate fluctuates significantly, customers may have little confidence in the scheme and could potentially 'speculate' by delaying or bringing forward the installation of equipment based on their view of future movements in the rate. That may then cause demand for renewable generation to fluctuate significantly, creating overcapacity or shortages in this market.

As Origin Energy has pointed out, large fluctuations in the premium rate can also impose administrative and compliance burdens on retailers as well as on distributors. The Commission is also aware that rapidly changing renewable energy policies and outcomes at all levels of government have been a source of criticism.

At the same time, a feature of the ACT feed-in scheme is that, once a generator has been installed, the premium rate for that year is guaranteed for the 20-year period. This provides investors with a high degree of certainty and does not force them into making long-term expenditure decisions in the presence of uncertainty about income. Because generation units are relatively quick and easy to install, potential investors can make decisions with relative confidence about costs and income. Should the premium rate in a particular year not prove attractive to investors, it can always be increased in the subsequent year as an incentive for investors to enter the market and install a zero-emissions generating system.

7.2.3 Simplicity and transparency

The proposed principles of simplicity and transparency are useful for stakeholders involved in the feed-in tariff process or with an interest in its outcomes. This wider group of stakeholders will include the renewable generation industry, consumer representatives, electricity retailers (including potential new entrants) and distributors, as well as general electricity consumers.

As a general rule, information on most key inputs to the calculation of the premium rate (such as the value of RECs and the cost of installing generation equipment) is relatively widely available from public sources. Therefore, it should be possible to adopt a modelling approach that is able to draw on such information and that allows all interested parties to replicate the calculation used to set the premium rate. Furthermore, in this context, any calculation of the tariff is unlikely to be over-complex.

7.2.4 Feedback loops

It is possible for the premium rate to be adjusted in future based on the outcomes of the feed-in tariff scheme to that time—for example, if it became apparent after two years of the scheme that a

10-year payback period was not proving attractive to customers and that limited generation capacity had been installed. In such a case, the payback period could be reviewed and reduced and the premium rate recalculated. Similarly, if the impact of other schemes to encourage carbon emissions reductions 'overtakes' the feed-in tariff scheme, the premium rate could be adjusted accordingly. However, the difficulty with implementing such feedback loops on an annual basis is that they introduce a much larger element of uncertainty into the decision-making process. For this reason, the Commission is of the view that no feedback loops should be contemplated, at least not over the four years following the 2010–11 premium rate determination.

It is expected that, under the provisions of the Act, the Minister would again seek the Commission's input to the setting of the premium rate for the five-year period commencing in 2015–16. At that time, the Commission could consider the need for significant changes in the model used to determine the premium rate.

7.2.5 Independent verification

The Act anticipates the Minister receiving advice from the Commission before a determination of the premium rate is made. The purpose of developing and using a model to adjust the premium rate (if required) over the four years form 2011–12 to 2014–15 is to minimise the administrative cost of running the feed-in tariff scheme. At the same time, the role of the Commission gives credibility to the determination of the premium rate, as it can be demonstrated that an independent assessment has been made of the various factors that will ultimately determine the premium rate for the next period.

Therefore, there is merit in the Commission retaining responsibility for oversighting the calculation of the premium rate on an annual basis. This need not involve an expensive public review process. In the same way that the Commission currently applies pricing determinations (for example, for water and sewerage prices) based on a five-year price path, it could administer the operation of any model to ensure that the principles outlined above are met and that the advice given to the Minister is in accord with the agreed premium rate determination mechanism. This would be consistent with the intentions of the Act, and in particular with the intentions of the Legislative Assembly when it incorporated a role for the Commission in the determination of the premium rate.

Under this arrangement, the Commission would have to have regard to the mechanism that had been set and agreed by the Minister. If any discretion is required, it could be applied by the Commission before a recommendation (along with the workings of the model for the next period) is given to the Minister and through the Minister to the Legislative Assembly. In this way, transparency and replicability would be assured, together with independent advice and administration of the premium rate determination model.

7.3 Conclusions

Having considered the matters above, the Commission believes that the model used to determine the premium rate for 2011–12 to 2014–15 should involve an appropriate trade-off between flexibility and certainty. To achieve this, the model should have the following features:

- In the absence of significant reductions in financial incentives provided by other government schemes, including as a result of changes in the value of RECs, the premium rate should be

set at that rate which provides a 10-year nominal undiscounted payback period for a 1.5 kW system.

- Where there are significant reductions in financial incentives provided by other government schemes, the payback period should be reviewed accordingly.
- The values for modelling parameters used to determine the premium rate for 2010–11 should be applied:
  - annual maintenance costs ($100 per annum)
  - annual average output per kilowatt of installed capacity (1,050 kWh will be produced for each 1 kW of installed capacity)
  - average degradation in output capacity over time (0.5%).
- Recent estimates of the financial costs of installing renewable generation, based on multiple and verifiable installer quotes, should be used for modelling purposes.
- Where a value for RECs needs to be adopted, the value at 1 January of the year in which the premium rate is to first apply should be used.
- The premium tariff announcement should be made at least three months before the commencement of the relevant financial year (as is required under the Act).
- The model used to calculate the premium rate should be made publicly available after the announcement of the premium tariff.

The model would be administered by the Commission on an annual basis, and the results from the model together with the workings of the model and all data used would be made available to the Minister by no later than 15 March of each year. The Minister would then use discretion as to whether any adjustment in the premium rate should be applied, and in so doing would make available all relevant data and calculations to the Legislative Assembly and the wider community.

The Minister would not be constrained to accept the outcome from the model, especially where any adjustment in rate is relatively minor (thereby addressing the need for certainty while maintaining the option of having flexibility where that is required). However, in the spirit of the Act's requirements, the full release of the Commission's calculations would ensure that all interested parties would be aware of the outputs from the model and the inputs that have been used in the model for the year concerned.

At the next full review point (that is, prior to 2015–16), the Commission would be tasked to review the model and price determination arrangements in detail and to provide appropriate advice to the Minister about how the rate might be set, and at what level, for the next five years.

Appendix 1 Terms of reference

Australian Capital Territory

Independent Competition and Regulatory Commission (Premium Rate—Electricity Feed-in) Terms of Reference Determination 2009

Disallowable instrument DI2009–225

made under the

***Independent Competition and Regulatory Commission Act 1997*, section 15 (Nature of industry references) and section 16 (Terms of industry references)**

Reference for investigation under Section 15

Pursuant to section 15(1) of the *Independent Competition and Regulatory Commission Act 1997* (the ICRC Act) and having regard to the provisions of section 10(3) and section 11 of the *Electricity Feed-in (Renewable Energy Premium) Act 2008 (*the Electricity Feed-in Act*)*, I refer to the Independent Competition and Regulatory Commission (the Commission) the provision of advice to assist with the determination of the premium rate to be paid for electricity that is supplied by compliant renewable energy generators to the distribution network under the provisions of the Electricity Feed-in Act.

Terms of reference for investigation under Section 16

I require that the Commission consider the following matters in relation to the conduct of the investigation:

1. The Commission is to develop a model for determining the premium rate which provides guidance on the determination of the rate for the period 1 July 2010 to 30 June 2011, and on a mechanism for annual adjustments of the rate for the following four years.

2. In developing the model and preparing its advice, the Commission must give priority to the:

    a. desirability of costs under the Electricity Feed-in Act impacting equitably on all electricity users;

b. need to encourage the generation of electricity from renewable sources;

c. need to reduce emissions from greenhouse gases;

d. need to reduce the likely effects of climate change; and

e. desirability of occupiers being able to recoup the cost of investment in renewable energy generation capacity within a reasonable time.

3. The Commission must also have regard to:

   a. the amounts payable under the Electricity Feed-in Act by an electricity distributor or an electricity supplier; and

   b. any additional metering costs passed on to an occupier because of Section 6(2)(c) of the Electricity Feed-in Act.

4. In conducting its investigation, the Commission should identify other matters relevant to the determination of the rate.

5. The Commission must produce its final report by 15 March 2010.

Simon Corbell MLA

Minister for Energy

30 October 2009

Appendix 2 Abbreviations and acronyms

ACAT	ACT Civil and Administrative Tribunal
ACT	Australian Capital Territory
AER	Australian Energy Regulator
Commission	Independent Competition and Regulatory Commission (ACT)
CPRS	Carbon Pollution Reduction Scheme
GGAS	Greenhouse Gas Abatement Scheme
kW, kWh	kilowatt, kilowatt hours
MW, MWh	megawatt, megawatt hours
NEM	National Electricity Market
NSW	New South Wales
PV	photovoltaic
REC	renewable energy certificate
RET	Renewable Energy Target
SHCP	Solar Homes and Communities Plan