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Solar Photovoltaic (PV) Feed-in Tariffs - some recent developments

Xanthe Paltridge
e-Research Brief 2010/02
January 2010

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INTRODUCTION

In July 2008, the Queensland [Solar Bonus Scheme](#) came into effect.¹ The scheme establishes a premium feed-in tariff (FIT) under which households and other small customers are paid a premium rate for the electricity that they are able to generate from rooftop solar photovoltaic panels (PVs) and export to the electricity grid.

The Solar Bonus Scheme was designed to maximise the benefits under the Commonwealth solar rebate Scheme: [Solar Homes and Communities Plan](#).² However on 9 June 2009, the Solar Homes and Communities Plan was abolished and has since been replaced with a new scheme called '[Solar Credits](#)' which now acts as one of the main policy instruments to encourage uptake of small scale solar PV installation across the nation.³ This change at the Commonwealth level may impact on uptake rates under the Solar Bonus Scheme. To help understand the likely impact, **Part 1** of this Brief will provide an outline of the Commonwealth schemes, followed by a comparison of the financial assistance available under both.

Since the commencement of the Solar Bonus Scheme, a number of inter-jurisdictional reports on FIT schemes have been published suggesting that significant uptake of solar PV installation is only likely to occur under a 'gross' FIT scheme, and much less likely to occur under a 'net' FIT scheme like the model adopted in Queensland under the Queensland Solar Bonus Scheme. The issue of 'gross' v 'net' FIT was a point of contention during Parliamentary Debates prior to the introduction of the Solar Bonus Scheme.⁴ In light of this and with reference to the observations made in the reports, **Part 2** of this Brief will, following a brief outline of the Solar Bonus Scheme, provide an overview of the benefits and drawbacks of a gross FIT versus a net FIT.

Part 3 of this Brief will then provide a brief outline of some recent developments in FIT schemes across Australia.

PART ONE

COMMONWEALTH REBATE SCHEMES

The Commonwealth first introduced a program for solar power rebates in the 1999/2000 budget.⁵ Since then, the program has changed a number of times.⁶ The most recent change occurred on 9 June 2009 when the Commonwealth Government called an end to the then existing [Solar Homes and Communities Plan](#), three weeks ahead of schedule (ABC News; Sydney Morning Herald). Under this Scheme, households with an annual taxable income of less than \$100,000 were entitled to an \$8,000 rebate for the installation of a solar PV system.⁷ This funded a significant portion of the capital costs of installation which could be around \$12,000 - \$15,000 for a standard 1kilowatt (kW) system, or similarly, around \$18,000 - \$22,500 for a 1.5kW system.⁸

In addition to the rebate, upon installation, households were entitled to create Renewable Energy Certificates (RECs) equivalent to the deemed electricity output of the system over the first 15 years of operation. RECs could be created upfront for the whole 15 year period (15 year deeming period); or consecutively at the beginning of each five year period (5 year deeming period), or each year (1 year deeming period). Each REC is equivalent to 1 megawatt hour of renewable energy generation. The method for calculating the number of RECs a system can create is set out in the Commonwealth [Office of the Renewable Energy Regulator \(ORER\)](#) publication: [SGU Owners Guide](#), and will depend on such factors as the capacity and location of a system.⁹ As an example, over a 15 year deeming period, a 1kW system installed in Brisbane could create 20 RECs; the same system located in Longreach could create 23 RECs. Similarly, a larger 1.5kW system installed in Brisbane could create 31 RECs whilst the same system in Longreach could create 34 RECs.

Once created, RECs can then be traded on the [REC Registry](#) for a price determined by the market.¹⁰ [ORER](#) does not administer or track the price of RECs, although, pricing information can be obtained from private organisations such as [The Australian Financial Markets Association](#) and [Green Energy Markets](#).

Many consumers find it more convenient to assign, at a discount, their right to create RECs for the full 15 year deeming period to the company installing the solar system (a registered agent with ORER), in exchange for a discount upon installation. The agent then creates and sells the RECs for several dollars more.

The New Solar Credits Scheme

The [Renewable Energy \(Electricity\) Act 2000 \(Cth\)](#) was amended in September 2009 to establish the new '[Solar Credits](#)' scheme.¹¹ This scheme takes effect retrospectively from 9 June 2009 (when the Solar Homes and Communities Plan ended).¹²

Under the scheme, solar credits are to be provided in the form of RECs. However, unlike its predecessor, there is no upfront capital subsidy. The unique feature of Solar Credits is the 'multiplier' which entitles applicants to claim up to 5 times the number of RECs for the same system installation than was previously

allowed (ie, before 9 June 2009). However, this multiplier is a transitional measure and will decrease over time and eventually be phased out in accordance with the schedule below:

Phasing out of the multiplier (source: [Office of the Renewable Energy Regulator](#))

Year	9 June 2009 – 30 June 2010	1 July 2010 – 30 June 2011	1 July 2011 – 30 June 2012	1 July 2012 – 30 June 2013	1 July 2013 – 30 June 2014	1 July 2014 – 30 June 2015	From 1 July 2015 onwards
Multiplier	5x	5x	5x	4x	3x	2x	No multiplier

Other features of Solar Credits are:

- non-means tested and therefore open to a broader range of applicants including schools, communities, businesses and developers;
- applies only to Small Generation Units that have no more than 100kW of system capacity, and a total annual electricity output of less than 250MWh;
- the multiplier only applies to the first 1.5kW of installed capacity (although RECs are available at a 1:1 ratio for electricity generated over this capacity limit).

A COMPARISON OF THE FINANCIAL ASSISTANCE AVAILABLE UNDER THE SOLAR HOMES AND COMMUNITIES PLAN AND THE SOLAR CREDITS SCHEME.

Below is a comparison of the financial assistance available to a consumer under the defunct Solar Homes and Communities Plan and the current Solar Credits scheme.¹³ The comparison assumes:

- a Brisbane based installation of (a) a 1kW system that creates 20 RECs over a 15 year deeming period, and (b) a 1.5kW system that creates 31 RECs over the same deeming period;
- installation before 1 July 2012, after which time the value of RECs gradually decreases in line with the phasing out of the multiplier (refer to table above);
- a REC spot¹⁴ price of \$37.08.

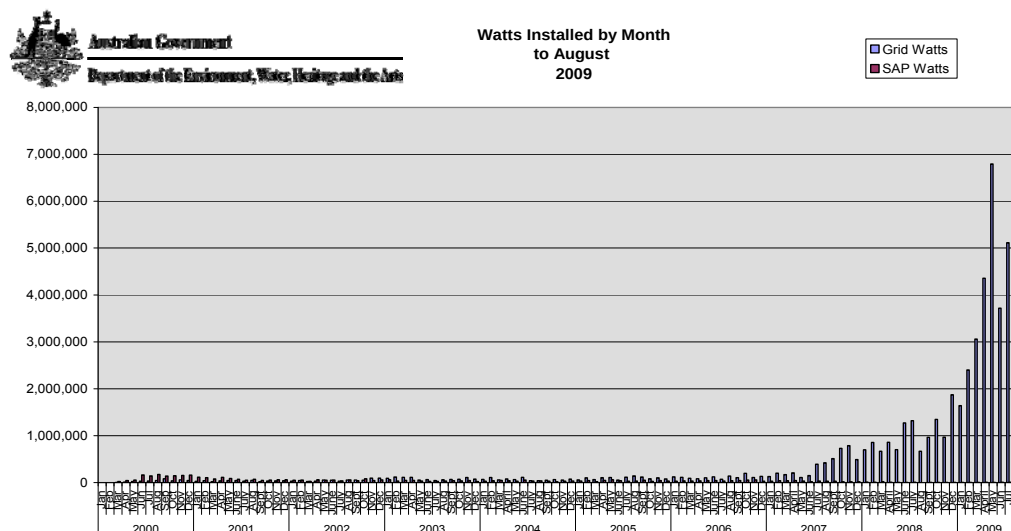
	Installed before 9 June 2009 under the Solar Homes and Communities Plan		Installed from 9 June 2009 under Solar Credits, but before 1 July 2012 (the multiplier is gradually phased out from 1 July 2012 with a corresponding reduction in the amount of RECs that can be claimed)	
	1kW	1.5kW	1kW	1.5kW
RECs worth	20 x \$37.08 = \$741.60	31 x \$37.08 = \$1,149.48	20 x 5 x \$37.08 = \$3,708.00	31 x 5 x \$37.08 = \$5,747.40
Rebate	\$8,000	\$8,000	Nil	Nil
Total subsidy	\$8,741.60	\$9,149.48	\$3,708.00	\$5,747.40

The above comparison shows that the financial assistance available under Solar Credits is less than that available under the Solar Homes and Communities Plan Scheme. RECs would need to be trading at a substantially higher price before a system installed under the Solar Credits scheme breaks even. The assistance under the Solar Credits scheme is also coupled with greater uncertainty given that the value of a REC can fluctuate over time in response to market conditions.¹⁵ However, as there is no means testing, the assistance is now available to more households and other small consumers.

A reduction in benefits under Solar Credits may adversely affect uptake of solar PV installation amongst the group of consumers who were previously eligible for the \$8,000 rebate under the Solar Homes and Community Plan (medium household income of less than \$100,000). According to Access Economics in a Paper published in November 2008, [The Economics of Feed-in Tariffs for solar PV in Australia](#),¹⁶ uptake of solar PV installation is very responsive to government subsidisation such as upfront capital rebates.¹⁷ This is evidenced by data on solar PV installation collected by the Commonwealth Department of the Environment, Water, Heritage and the Arts which shows a rapid rise in the monthly solar PV capacity additions across Australia in

response to the doubling of the Commonwealth capital rebate from \$4,000 per system to \$8,000 in May 2007; and a subsequent decline in June 2009 when the Solar Homes and Communities Plan was abolished ahead of time:

Source: [Commonwealth Department of the Environment, Water, Heritage and the Arts](#)¹⁸



Also according to Access Economics, target setting schemes such as the Commonwealth's expanded [Renewable Energy Target](#) and the proposed [Carbon Pollution Reduction Scheme](#) are expected to be insufficient drivers on their own to achieve significant growth in the solar PV industry and as such, complementary measures such as FIT programs would be necessary to bring forward investment in the industry.¹⁹

PART TWO

Part two of this Brief will now look at Queensland's FIT program and the debate between gross and net FIT schemes.

QUEENSLAND SOLAR BONUS SCHEME

The Queensland [Solar Bonus Scheme](#) became operational in July 2008 and is expected to run for 20 years winding up in 2028 (to be reviewed in 2018 or when 8 megawatts of solar systems are installed).²⁰ It represents Queensland's first solar power premium FIT program.

The objectives of the Queensland Solar Bonus Scheme are:²¹

- to make solar power more affordable;
- to boost Queensland's use of renewable energy;
- to encourage energy efficiency; and
- to stimulate the solar power industry in Queensland.

The benefits and drawbacks of FIT programs are well documented and a list with links to some recent publications on the topic is provided in **Appendix A**.²² Whilst it is not within the scope of this Brief to provide a full account of the points raised in these publications, briefly, the benefits of a FIT scheme are generally cited to be (a) the diversification and maturation of renewable energy sources, (b) improved supply reliability, (c) development of a solar PV industry and job creation, (d) correction of market failures, (e) reduction in network costs and transmission losses, and (e) abatement of greenhouse gas emissions. The drawbacks of a FIT scheme are usually said to be that it (a) is a regressive policy instrument, (b) distorts the market and (c) is an expensive and inefficient means of greenhouse gas abatement.

The Solar Bonus Scheme applies to small customers such as households and small businesses with an annual consumption of less than 100MWh per year (below the annual limit of 250MWh under Solar Credits). Central to the scheme is the premium rate paid for the solar electricity that a consumer is able to export to the electricity grid: \$0.44/kWh - almost three times the retail rate of electricity of \$0.1884/kWh.²³

However, under the scheme, not all electricity that is generated can be exported as eligible systems must be configured so that solar energy produced is first fed directly into the house for meeting household consumption. Electricity can only be exported if a household is able to generate more electricity than it uses

(thereby creating 'net' exports). According to [Choice](#), the electricity generated from the most popular sized domestic system - a 1kW system - equates to roughly 20% of the average household electricity consumption (more electricity is produced in bigger and more expensive systems):²⁴

- the average Australian household consumes about 18kW hours of electricity per day (with Queensland households consuming more); whilst
- an average 1kW system produces about 4kW hours of electricity per day.

Based on these figures, a household with a 1kW system will be able to save about 20% on electricity bills. This is in addition to the payments a household would receive in relation to the electricity that it is able to export during those times of the day that solar electricity is being generated but not consumed. The export potential of a system will vary greatly and depend on such factors as the size of the system, location, weather, and consumption patterns of the household.²⁵ For instance, whilst families that are away during the day are likely to export solar power, families that are home during the day are unlikely to produce enough electricity from a standard domestic system for this to occur.²⁶

The Queensland [Office of Clean Energy](#) estimates that under the Queensland Solar Bonus Scheme, an 'average' household operating a 1 kW system could save up to 25% on electricity bills when exports are taken into consideration.

'NET' AND 'GROSS' FIT

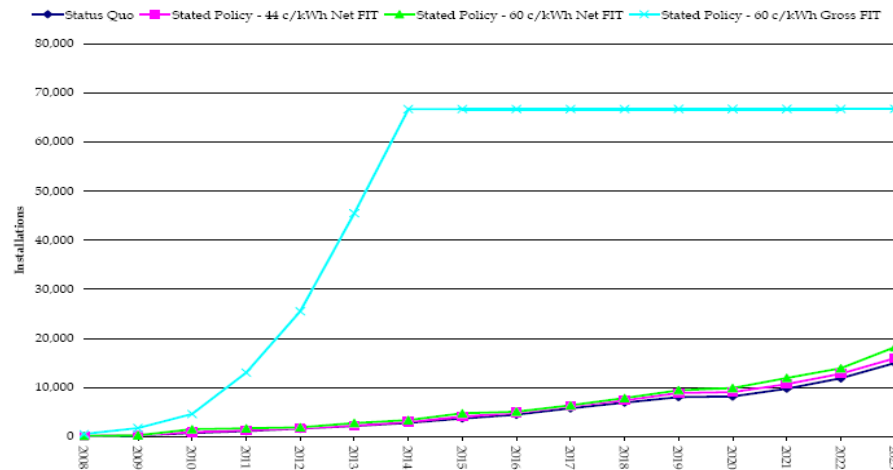
According to some recent reports that are referred to below, significant uptake of solar PV will only occur under a generous 'gross' FIT scheme rather than with a 'net' FIT scheme. A **'gross' FIT** is better for households that have installed a solar system because *all* solar electricity that a household generates is exported to the grid at the premium rate. At the same time, *all* electricity consumed by a household is imported from the grid but at the standard retail rate. Under a **'net FIT'**, only excess solar electricity is exported to the grid at the premium rate.

By allowing consumers to be paid at a premium rate for all electricity produced, a gross FIT decreases the 'payback period' – the number of years it takes a consumer to recover the capital costs of installation²⁷ (although, revenues under a net FIT can be made reasonably comparable by increasing the tariff by roughly 2-4 times²⁸). A shorter payback period makes solar PV installation a more attractive investment.²⁹ For example, one of the key messages to have come out during stakeholder consultation in preparation for the implementation of a FIT scheme in Victoria was that it was necessary to have a payback period of less than 15 years.³⁰ Similarly, in New South Wales, public submissions received by the NSW Solar PV Feed-in Tariff Taskforce in considering the implementation of a FIT scheme in that state revealed that most respondents advocated for a tariff rate that would enable the consumer to recoup the costs of installation - a 10 year payback period was the most popular time period suggested.³¹ The expected life of a solar system is estimated to be around 20 - 25 years.³² The NSW Taskforce, in its report [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, provides an analysis of payback periods modelled under various FIT scheme scenarios. The analysis of a 20 year scheme in summary form is attached as **Appendix B** and demonstrates the sensitivity of the payback period to tariff type and rate. For example a net FIT of \$0.44/kWh would have a non discounted payback period of just over 15 years, whilst a gross FIT of the same amount would have a non discounted payback period of just over 10 years.³³ Various assumptions of significance are made in the modelling and these are reproduced as **Appendix C**. Other estimated payback periods are:

- 10 years under ACT's gross FIT of between \$0.4004/kWh - \$0.5005/kWh;³⁴
- 12 years under NSW's net FIT of \$0.60/kWh.³⁵

In a recent report commissioned by the Victorian Government and prepared by McLennan Magasanik Associates, significant uptake of solar PV installation will only occur with a gross FIT of \$0.60/kWh.³⁶ The below graph is extracted from the [McLennan Magasanik Associates' Report](#) and shows a relatively large projected uptake in Victoria of over 60,000 installations by 2015 under a gross FIT of \$0.60/kWh, compared with less than 6,000 for FITs set at either the standard retail price (ie, no premium), net \$0.44/kWh or net \$0.60/kWh.³⁷

Figure 4-1 Cumulative number of installed photovoltaic systems

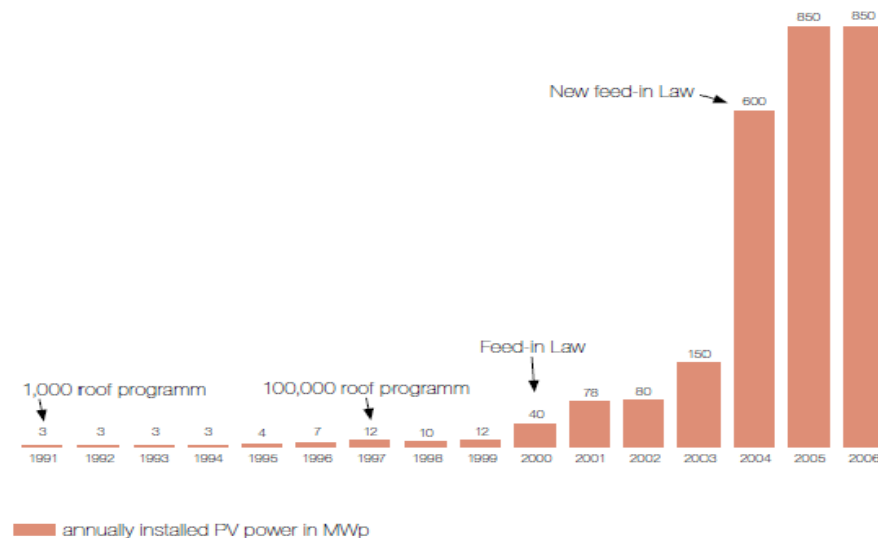


In another report commissioned by the Victorian Government by Firecone Ventures Pty Ltd, [Options to increase the uptake of small-scale solar power by Victorian households](#), April 2008, it is concluded that:³⁸

- if the dominant or sole objective is to increase investor confidence in long term demand, then Victoria should adopt a *gross* FIT of \$0.60/kWh (with a cap of 200MW);
- a *gross* FIT of \$0.40/kWh would increase uptake whilst constraining costs. This would significantly improve the financial viability of solar PV; and
- a *net* FIT of \$0.40/kWh would translate into a minor additional support leaving solar PV with a negative present value and long payback.

Germany, the world's leading country in solar PV installation, is often used to demonstrate how a favourable FIT policy can significantly enhance uptake of solar PV installation.³⁹ The below graph is extracted from the Report by Access Economics and shows an increase in annual solar PV installation in Germany in response to the introduction of favourable policy in 2000 (introduction of a gross FIT); and an even more dramatic increase in 2004 in response to a subsequent enhancement of the program.⁴⁰

FIGURE 12: RESPONSIVENESS OF SOLAR PV UPTAKE TO A FEED IN TARIFF IN GERMANY



Source: European Photovoltaic Industry Association (2007)

According to Access Economics, the prime mechanism for promoting PV installation internationally is the gross FIT, with over 46 countries, states and provinces having implemented this model by 2007.⁴¹ In a report by the Commonwealth Senate Standing Committee on Environment, Communications and the Arts, [Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#), November 2008, it is observed that according to most experts, it would appear that the benefits of a net FIT scheme are either limited or nonexistent.⁴²

However, a major obstacle associated with implementing a gross FIT is that it is a more expensive option. Most FIT schemes (net or gross), like the Solar Bonus Scheme, are cross-subsidised by the end consumer through the imposition of higher charges for electricity. Allowing households to export all electricity generated

at a premium FIT would require greater cross-subsidisation and therefore bigger electricity bills. Low income households would be worse off as they are not only less likely to be able to afford the installation of a solar PV system, but also because they spend a higher proportion of their income on energy consumption.⁴³ It is principally for this reason that a gross FIT is said to be regressive in nature.⁴⁴ **Appendix B** provides a useful costing analysis of the average annual increase in electricity bills per electricity consumer and households in NSW under various gross and net FIT scenarios (refer to **Appendix C** for the assumptions made in this analysis). Under the Solar Bonus Scheme, the Government had estimated that cross-subsidisation would result in an increase to electricity bills of less than \$1.00 per customer per year.⁴⁵ Under the more generous schemes of Victoria and NSW where a net FIT is set (or proposed to be set) at \$0.60/kWh, it has been estimated that cross-subsidisation would involve an increase of up to \$10 per year for electricity consumers in Victoria (measures are in place to ensure prices do not go above this amount)⁴⁶ and between \$2- \$9 per year per household in NSW.⁴⁷

In addition to the issue of cross-subsidisation, gross FITs may not be an efficient means to reduce greenhouse gas emissions. Firecone Ventures Pty Ltd, in its Report mentioned above, concluded that whilst significant uptake hinges on generous FIT schemes, a gross FIT of \$0.60/kWh "...would be an expensive and inefficient response to greenhouse gas abatement..."⁴⁸ and that premium FITs are likely to "...distract attention and funding from more efficient responses...with...little impact in advancing the date at which solar PV technology becomes cost effective against other generation technologies."⁴⁹ Similar views have been expressed by the New South Wales Department of Industry & Investment,⁵⁰ the Victorian Government,⁵¹ Western Australia Sustainable Energy Development Office,⁵² the ACT Independent Competition and Regulatory Commission,⁵³ Access Economics,⁵⁴ and Roger Wilkins in the *Wilkins Review*.⁵⁵

According to Firecone Ventures Pty Ltd, "Under very ambitious targets solar PV would account for 5% of energy in 2020".⁵⁶

PART THREE

DEVELOPMENTS ACROSS AUSTRALIA

Across Australia, there would appear to be widespread community support for a gross FIT. This is evident from the submissions received from a diverse range of respondents ranging from environmental and industry groups to private individuals in relation to various state and Commonwealth enquiries on the topic of FIT schemes.⁵⁷ An online petition by [Energy Matters](#) (private company selling wind and solar energy products) advocating for a national gross FIT has now over 19,000 signatories: [Petition: Let's get Australia moving on solar feed in tariffs](#).⁵⁸

Despite popular support, a Private Senator's Bill introduced into the Commonwealth Senate on 11 November 2008 to establish a national gross FIT scheme failed to gain Government and Opposition support.⁵⁹ The Bill, [Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008 \(Cth\)](#), was introduced by Senator Milne, Deputy Leader of the Australian Greens, and constituted a revised version of an earlier bill entitled the same that was introduced on 15 May 2008.⁶⁰ The earlier Bill was referred to the Senate Standing Committee on Environment, Communications and the Arts which published a report in November 2008 entitled [Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#). In this Report, the Committee concluded that:⁶¹

While strongly supporting a nationally consistent feed-in tariff framework, the committee recommends the current bill not proceed.

Instead, the Committee recommended (amongst other things) that the Council of Australian Governments (COAG) implement a national FIT framework.⁶² This recommendation has led to the publication on 29 November 2008 of COAG's [National Principles for Feed-in Tariff Schemes](#) (refer to **Appendix D** for a full version of the Principles). These principles are broad in nature and grant the States and Territories broad discretion in the design and implementation of FIT schemes such that both a net and gross FIT would be compatible.

In a further attempt to have the Commonwealth Parliament legislate for a national gross FIT scheme, on 18 August 2009 Mr Robert Oakeshott MP, Independent, introduced into the House of Representatives the [Renewable Energy Amendment \(Feed-in-Tariff for Electricity\) Bill 2009](#). On 14 September 2009, the [Second Reading](#) (pp 9495-9497) for the Bill was adjourned (click [here](#) to track the Bill's status).

INTERSTATE FIT SCHEMES

In the absence of a national FIT scheme, most jurisdictions have either implemented a FIT scheme or are in the process of doing so. South Australia and Queensland were first with both States having commenced schemes in July 2008.⁶³ The ACT followed with the implementation of a scheme in March 2009. After rigorous debate in Parliament, Victoria has recently legislated for a scheme commencing in November 2009.

Schemes have been proposed in New South Wales (proposed to commence 1 January 2010), Western Australia (proposed to commence 1 July 2010), and Tasmania (no proposed commencement date announced). No scheme has been announced for the Northern Territory, although the Solar Cities Programme has been running in Alice Springs since 2007.⁶⁴

Only the ACT has a gross FIT, with the Western Australian Government recently announcing that it would not meet its 2008 election promise to implement a gross FIT.⁶⁵ Across Australia, net FIT schemes are either in place or proposed to be in place in Queensland, Western Australia, South Australia, Victoria, New South Wales and Tasmania.

Queensland, together with South Australia, currently has one of the lowest rates in Australia with a net FIT of \$0.44/kWh. The ACT hosts the most generous scheme with a gross FIT of between \$0.4004 and \$0.5005 kWh. Victoria has, and NSW proposes to have, a net FIT of \$0.60kWh. Rates for Western Australia and Tasmania are still to be advised.

A summary of the key design elements of interstate FIT schemes is provided in **Appendix E**.

LINKS TO FURTHER READING

COMMONWEALTH

Legislation, Regulations and Bills

- [Renewable Energy \(Electricity\) Act 2000](#) (amended by [Renewable Energy \(Electricity\) \(Amendment\) Act 2009](#)); [Renewable Energy \(Electricity\) Regulations 2001](#)
- [Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#) (introduced by Senator Christine Milne, Australian Greens, 15 May 2008, discharged from Notice Paper 11 November 2008); [Explanatory Memorandum](#); Parliamentary Debates ([Second Reading](#), 15 May 2008, pp 1962-1963)
- [Renewable Energy Amendment \(Feed-in Tariff for Electricity\) Bill 2008](#) (revised version of Bill introduced on 15 May 2008. Introduced by Senator Christine Milne, Australian Greens, 11 November 2008); [Explanatory Memorandum](#); Parliamentary Debates ([Second Reading](#), 11 November 2008, pp 6537-6541; [Resumption of Second Reading Debate](#), 13 November 2008, pp 6919 - 6946)
- [Renewable Energy Amendment \(Feed-in-Tariff for Electricity\) Bill 2009](#) (introduced by Mr Oakeshott MP, Independent, 18 August 2009); Parliamentary Debates ([First Reading](#), 18 August 2009, pp 8137-8138; [Second Reading](#), 14 September 2009, pp 9495-9497)

Senate Inquiries

- Standing Committee on Environment, Communications and the Arts, [Inquiry into Save Our Solar \(Solar Rebate Protection\) Bill 2008 \[No. 2\]](#):
 - o [Report](#), August 2008
 - o [Submissions](#)
- Standing Committee on Environment, Communications and the Arts, [Inquiry into the Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#):
 - o [Report](#), November 2008
 - o [Submissions](#)

Government Publications

- Department of the Environment, Water, Heritage and the Arts:
 - o [Solar Homes and Communities Plan](#) (webpage); [Watts installed by month](#); [Systems installed by State](#)
 - o [Australia's Solar Cities](#) (webpage); [Solar Cities Programme Guidelines](#), 2005
- Department of Climate Change:
 - o [Solar Credits – Frequently Asked Questions](#) (webpage)
 - o [Small scale renewable energy systems under the RET scheme](#) (webpage)
 - o [Carbon Pollution Reduction Scheme](#) (webpage)
 - o [Renewable Energy Target](#) (webpage)
- [Office of the Renewable Energy Regulator](#):
 - o [SGU Owner's Guide](#), April 2009
 - o [RET: the Basics Fact Sheet](#), 9 September 2009

Ministerial Media Statements

- Ministerial Media Statements: [10 September 2009](#); [30 April 2009](#); [17 December 2008](#)

QUEENSLAND LEGISLATION, POLICY DOCUMENTS, OTHER PUBLICATIONS & WEBSITES

- [Electricity Act 1994](#); [Electricity Regulation 2006](#)
- [Clean Energy Bill 2008](#), (incorporating FIT scheme for PV systems into *Electricity Act 1994*); [Explanatory Notes](#); Queensland Parliamentary Debates ([Second Reading](#), 29 April 2008, pp 1239-1242, [Resumption of Second Reading](#), 13 May 2008, pp 1574-1580).
- [ClimateSmart 2050: Queensland climate change strategy 2007: a low-carbon future](#), June 2007

- Department of Employment, Economic Development and Innovation, Office of Clean Energy:
 - o [Solar Bonus Scheme](#) (webpage)
 - o [Solar Bonus Scheme Q&As](#) (undated)
 - o [How a grid-connected solar photovoltaic system works](#)

INTERSTATE LEGISLATION, POLICY DOCUMENTS, OTHER PUBLICATIONS & WEBSITES

Australian Capital Territory

- o [Electricity Feed-in \(Renewable Energy Premium\) Act 2009](#) (an Act to amend [Electricity Feed-in \(Renewable Energy Premium\) Act 2008](#)):
 - [Electricity Feed-in \(Renewable Energy Premium\) Bill 2008](#); [Explanatory Statement](#); Parliamentary Debates ([9 April 2008](#); [25 June 2008](#); [2 July 2008](#))
 - [Electricity Feed-in \(Renewable Energy Premium\) Amendment Bill 2009](#); [Explanatory Statement](#)
- o Department of the Environment, Climate Change, Energy and Water, [ACT Electricity Feed-in-Tariff Scheme](#), Fact Sheet (undated).
- o Chief Minister's Department:
 - [Feed-in Tariff Discussion Paper](#), December 2007
 - [Feed-in Tariff Discussion Paper: Report on Public Consultation](#) (undated)
- o Independent Competition and Regulatory Commission, [Feed-In Tariff Discussion Paper - Comments](#), February 2008

New South Wales

- NSW Solar Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009:
 - o [Submissions](#)
- Department of Industry and Investment (trading as Industry and Investment NSW):
 - o [Solar Bonus Scheme for NSW](#) (webpage);
 - o [NSW Solar Bonus Scheme – Frequently Asked Questions](#) (webpage);
 - o [Solar Power](#) (website)
- Ministerial Media Statement: '[Solar Bonus Scheme for NSW announced](#)', 23 June 2009

South Australia

- o [Electricity \(Feed-In Scheme - Solar Systems\) Amendment Act 2008](#) (an Act to amend the [Electricity Act 1996](#))
- o Department of the Premier and Cabinet, Sustainability and Climate Change Division:
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- "Council rebate puts solar within reach" (Brisbanetimes.com.au, 12 August 2008)
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APPENDIX A

LIST OF PUBLICATIONS PROVIDING AN ANALYSIS OF THE COSTS AND BENEFITS OF FIT SCHEMES

- Commonwealth Parliamentary Library Research Service, [*Electricity Industry Amendment \(Premium Solar Feed-In Tariff\) Bill 2009*](#), Research Brief No 2, 2009
- NSW Solar Feed-in Tariff Taskforce, [*NSW Solar Feed-in Tariff Report to Ministers*](#), February 2009 (Taskforce members: Department of Water and Energy, Department of Environment and Climate Change, Department of Premier and Cabinet, NSW Treasury)
- Access Economics Pty Limited, [*The Economics of Feed-in Tariffs for solar PV in Australia*](#), November 2008 (report for Clean Energy Council)
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- Firecone Ventures Pty Ltd, [*Options to increase the uptake of small-scale solar power by Victorian households*](#), April 2008 (Cabinet in Confidence document)
- The Senate Standing Committee on Environment, Communications and the Arts, [*Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008*](#), November 2008
- Tasmanian Department of Infrastructure, Energy and Resources, [*Feed-in Tariffs Discussion Paper*](#), 2008
- Western Australian Photovoltaic Working Group of the Sustainable Energy Development Office, [*Report to the Minister for Energy*](#), February 2008
- Ross Garnaut, [*The Garnaut Climate Change Review, Final Report, Network Infrastructure, Chapter 19*](#), 2008
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APPENDIX B

FINANCIAL ANALYSIS: PAYBACK PERIODS UNDER VARIOUS FIT SCENARIOS - 20 YEAR SCHEME DURATION

(Source: NSW Solar Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, p 29) See Appendix C for assumptions used.

Table 5 - Financial analysis of scenarios – 20 year Scheme duration

Tariff rate and tariff type		Low and high scenarios (participants)	Total Scheme cost (2009 \$m)	Total Scheme cost (NPV \$m) ¹	Average annual Scheme cost (2009 \$m)	Average annual increase in electricity bills per electricity consumer (2009 \$) ²	Average annual increase in electricity bills per household (2009 \$) ³	Scheme cost per household in year 3 (2009 \$)	Annual customer benefit (2009 \$) ⁴	Payback period	
										Simple payback (years)	Discounted payback (years)
Scenario 1	Net 22c/kWh	42,900	\$131.1	\$70.8	\$6.6	\$2.06	\$0.76	\$0.28	\$449	24.7	Never
		202,900	\$591.9	\$314.2	\$29.6	\$9.32	\$3.44	\$1.05			
Scenario 2	Net 44c/kWh	42,900	\$262.2	\$141.5	\$13.1	\$4.13	\$1.53	\$0.57	\$723	15.3	Never
		202,900	\$1,183.7	\$628.4	\$59.2	\$18.64	\$6.89	\$2.10			
Scenario 3	Net 60c/kWh	42,900	\$357.5	\$193.0	\$17.9	\$5.63	\$2.08	\$0.77	\$923	12	18.8
		202,900	\$1,614.2	\$856.9	\$80.7	\$25.42	\$9.40	\$2.86			
Scenario 4	Gross 22c/kWh	42,900	\$262.2	\$141.5	\$13.1	\$4.13	\$1.53	\$0.57	\$549	20.2	Never
		202,900	\$1,183.7	\$628.4	\$59.2	\$18.64	\$6.89	\$2.10			
Scenario 5	Gross 35c/kWh	42,900	\$417.1	\$225.2	\$20.9	\$6.57	\$2.43	\$0.90	\$873	12.7	20.6
		202,900	\$1,883.2	\$999.8	\$94.2	\$29.65	\$10.96	\$3.34			
Scenario 6	Gross 44c/kWh	42,900	\$524.4	\$283.1	\$26.2	\$8.26	\$3.05	\$1.14	\$1,097	10.1	14.4
		202,900	\$2,367.5	\$1,256.8	\$118.4	\$37.28	\$13.78	\$4.20			

¹ NPV = Net present value, calculated with a discount rate of 5%.

² This is an average across all electricity consumers, including households, businesses, schools and hospitals. Care should be taken in applying it to individual cases.

³ Households represented 31% of all electricity consumption in NSW in 2007.

⁴ Under a gross scheme, the total benefit equals the tariff payment. Under a net scheme, PV-generated electricity consumed by the owner displaces some electricity that would otherwise be purchased off the grid. Hence the owner receives the benefit of the tariff payment plus the value of the avoided electricity from the grid.

APPENDIX C

ASSUMPTIONS USED IN THE APPENDIX B FINANCIAL ANALYSIS – 20 YEAR SCHEME DURATION

(Source: NSW Solar Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, pp 52-54)

Assumption	Value	Units	Methodology / Source
Solar radiation on north facing surface at 34° tilt in Sydney	5.06 1,847	kWh/m ² /d kWh/m ² /yr	University of NSW solar data at Kensington over period of 8 years.
Average annual household electricity use	7,500	kWh/yr	ESAA publication "Electricity Gas Australia 2008" – NSW and ACT 2007 data.
Size of PV system	1.5	kWpk	Average size of installed Solar PV system. Data supplied from Solar Homes and Communities Plan, Commonwealth Government. http://www.environment.gov.au/settlements/renewable/pv/index.html
PV system output	2,770	kWh/yr	Calculated from solar radiation data integrated to equivalent number of hours at 1kW/m ² multiplied by the PV system peak power rating (which is the output of a PV panel exposed to solar radiation of 1kW/m ²).
PV output minus 10% inverter and wiring losses	2,493	kWh/yr	Assumed 10% loss as an annual average. Does not take into account a failure rate or maintenance down time.
PV system installed cost rate	12.5	\$/Wpk	Typical installed cost of a residential PV system (also used by MMA in its modelling report to the Dept of Climate Change (page 8).
PV system installed cost	18,750	\$	= (Size of PV System) X (PV System Cost Rate)
Commonwealth rebate of zero	0	\$	Commonwealth Solar Homes and Communities Plan rebate of \$8 per watt peak up to \$8,000 will no longer be available from July 2009. Commonwealth proposes to replace this with the Solar Credits Scheme which will provide for PV systems to receive 5 x RECs.
REC spot price at 15 Dec 08	48.70	\$	Next Generation Energy Solutions Pty Ltd "The Green Room" publication 15 Dec 08
MRET zone 3 rating	1.382		Renewable Energy (Electricity) Regulations 2001 (16 December 2006 compilation), Schedule 5 zone rating for postcodes 1001 to 2356

Assumption	Value	Units	Methodology / Source
5 x Up front value of RECs for 15yrs	7,673	\$	= (Size of PV System) X (Zone 3 Rating) X (REC Spot Price) X (15 Years) X (5x RECs given by Fed Govt) Renewable Energy (Electricity) Regulations 2001 (16 December 2006 compilation), Subdivision 2.3.3 paragraph 20 (1) (b), and paragraphs 7 and 8
Remaining capital cost	11,077	\$	= (PV system installed cost) – (Upfront value of RECS)
Domestic electricity tariff	14	c/kWh	Average residential tariff offered by NSW retailers.
Annual cost of 7500kWh at domestic rate	1,050	\$p.a.	= (Domestic Electricity Tariff) X (Average Annual Household Usage)
Discount rate	5%		This figure is based on a real weighted average cost of capital set at 5% above the risk free long-term bond rate.
Net export rate to grid	50%		South Australia provided data
Lifetime of Solar System	20 to 25	years	Solar PV warranty
Increase in retail tariffs with time			Not applied in the spreadsheet calculations.
PV system capital cost decline factor			Not applied in the simple spreadsheet calculations.
Rate of uptake	Linear		Used for simplicity and in the absence of complex modelling of likely uptake. Does not take into account that some factors are likely to encourage high levels of early participation – e.g. Commonwealth policy settings (ending of rebates, introduction and phased digression of RECs multiplier), plus a general incentive for a fixed terms FiT to maximise income from early participation.
Existing grid-connected solar PV systems in NSW	2900		Systems installed by State under the Commonwealth's Solar Homes and Communities Plan, as at December 2008.

Assumption	Value	Units	Methodology / Source
			http://www.environment.gov.au/settlements/renewable/pw/pubs/installedbystate-dec08.xls
Number of electricity consumers in NSW	3 175 229		ESAA, <i>Electricity Gas Australia 2008</i> ACTEWAGL, <i>Annual and Sustainability Report 2008</i>
Number of households in NSW	2 679 407 (31% of electricity consumption)		ESAA, <i>Electricity Gas Australia 2008</i>
Voluntary Feed-in Payments made by NSW electricity retailers			These were not taken into account in the spreadsheet calculations. Only payments under a NSW Solar PV FIT Scheme were calculated.

APPENDIX D

COUNCIL OF AUSTRALIAN GOVERNMENTS: NATIONAL PRINCIPLES FOR FEED-IN TARIFF SCHEMES, 29 NOVEMBER 2008¹

Micro renewable generation to receive fair and reasonable value for exported energy

1. That Governments agree that residential and small business consumers with small renewables (small renewable consumers) should have the right to export energy to the electricity grid and require market participants to provide payment for that export which is at least equal to the value of that energy in the relevant electricity market and the relevant electricity network it feeds in to, taking into account the time of day during which energy is exported.

Any premium rate to be jurisdictionally determined, transitional and considered for public funding

2. That any jurisdictional or cooperative decisions to legislate rights for small renewable consumers to receive more than the value of their energy must:
 - a) be a transitional measure (noting that a national emissions trading system will provide increasing support for low emissions technologies), with clearly defined time limits and review thresholds;
 - b) for any new measures, or during any reviews of existing measures, undertake analysis to establish the benefits and costs of any subsidy against the objectives of that subsidy (taking into account other complementary measures in place to support small renewable consumers);
 - c) give explicit consideration to compensation from public funds or specific levies rather than cross-subsidised by energy distributors or retailers; and
 - d) not impose a disproportionate burden on other energy consumers without small renewable generation.

¹ This document is available at http://www.coag.gov.au/coag_meeting_outcomes/2008-11-29/docs/20081129_national_principles_fits.rtf. The COAG Communiqué for 29 November 2008 is available at http://www.coag.gov.au/coag_meeting_outcomes/2008-11-29/index.cfm#tabs.

MCE to continue to advance fair treatment of small renewables

3. That the Ministerial Council on Energy (MCE) should continue to implement the regulatory arrangements for small renewable customers, consistent with the objectives of the relevant electricity legislation, whereby the:
 - a) terms and conditions for PV customers should be incorporated into the regulation of the minimum terms and conditions for retail contracts such that they are no less favourable than the terms and conditions for customers without small renewables;
 - b) connection arrangements for small renewables customers should be standardised and simplified to recognise the market power imbalance between small renewable customers and networks; and
 - c) assignment of tariffs to small renewable consumers should be on the basis that they are treated no less favourably than customers without small renewables but with a similar load on the network.

FiT policy to be consistent with previous COAG agreements (particularly the Australian Energy Market Agreement)

4. That the arrangements for PV consumers by the MCE and jurisdictions:
 - a) should not deter competition for their business from electricity retailers in jurisdictions where there is full retail contestability and innovation in the tariff offerings available to PV customers;
 - b) in relation to jurisdictions in the National Electricity Market, should not interfere with the regulation of distribution tariffs or operation of the national electricity market under the National Electricity Law or duplicate the regulatory arrangements that are part of that Law;
 - c) should be subject to independent regulatory oversight according to clear principles; and
 - d) should be consistent with implementation of other intergovernmental agreements relating to energy, competition policy or climate change.

APPENDIX E

SUMMARY OF KEY DESIGN ELEMENTS OF INTERSTATE FIT SCHEMES²

State	Start	Tariff type and amount (cents/kWh)	Duration in years	Sector limitations	Capacity limitations ³
QLD	1 July 2008	Net \$0.44 (over 2x standard retail rate)	20	Small customers (eg household, small businesses) with annual energy consumption of less than 100 MWh/yr (average home uses about 7.6MWh/yr) ⁴	≤10kVA -single phase ≤30kVA - three phase
SA	1 July 2008	Net \$0.44 (approx 2x standard retail rate)	20	Small customers (eg household, commercial, churches, schools) with annual energy consumption of less than 160MWh/yr	≤10kVA- single phase ≤30kVA - three phase
ACT	1 March 2009	Gross \$0.5005 ≤ 10kW (approx 3.88 x standard rate) \$0.4004 10≤ 30kW	20	No restrictions on class of consumer except non-education government agencies (premium rate paid to any consumer up to first 10kWh installed capacity).	≤ 10kW (premium rate) 10 ≤ 30kW (80% of premium rate)
VIC	1 November 2009	Net \$0.60kWh (approx over 3x standard rate)	15	Small customers (eg household, small businesses, community organisations) with annual energy consumption of less than 100MWh/yr.	≤5kW Available only for the first 100MW of statewide installed capacity (up to 100,000 households)
NSW	Proposed to start 1 January 2010	Proposed net \$0.60kWh (approx 4 times standard retail price)	20	Small customers (eg household, commercial, churches, schools) with annual energy consumption of less than 160MWh/yr.	≤10kW
WA	Proposed to start 1 July 2010	Proposed net. Rate TBA	TBA	TBA	TBA
TAS	TBA	TBA	TBA	TBA	TBA

² See, eg, Senate Standing Committee on Environment, Communications and the Arts, Renewable Energy (Electricity) Amendment (Feed-in Tariff) Bill 2008, [Report](#), p 5; Choice, [Solar panels buying guide](#); Energy Matters, [Feed-in tariff for grid-connected solar systems](#), Access Economics, [The Economics of Feed-in Tariffs for Solar PV in Australia](#), p 17; Victorian Parliamentary Library Research Service, *Electricity Industry Amendment (Premium Solar Feed-In Tariff) Bill 2009*, [Research Brief](#) No 2, 2009, p 12; New South Wales, Ministerial Media Statement: [‘Solar Bonus Scheme for NSW announced’](#), 23 June 2009.

³ Note that the Solar Credits ‘REC multiplier’ only applies to the first 1.5kW of installed capacity. Three phase power means there are three separate alternating currents and the voltages vary sequentially. Single phase power means that the alternating current has one phase. VA are volt-amperes.

⁴ Queensland Government Office of Clean Energy, [Solar Bonus Scheme Q&As](#), p 1.

ENDNOTES

- ¹ The [Clean Energy Bill 2008](#) amended the [Electricity Act 1994](#) to implement the Solar Bonus Scheme. The Solar Bonus Scheme is a component of Queensland Government's 2007 climate change strategy, [ClimateSmart 2050](#) (p viii), which sets out Queensland's long-term goals in combating climate change by lowering the State's carbon footprint.
- ² [ClimateSmart 2050](#), p viii.
- ³ Other Commonwealth policies encouraging uptake of solar PV installation are the [National Solar Schools Program](#) (currently suspended to new claims in 2009-10, effective 15 October 2009), [Green Loans Scheme](#); [Solar Cities](#), the extended [Renewable Energy Target](#) and the [Carbon Pollution Reduction Scheme](#) (proposed to commence 1 July 2011).
- ⁴ For example, see Queensland Parliamentary Debates ([Resumption of Second Reading](#), 13 May 2008, pp 1574-1580)
- ⁵ Commonwealth Senate Standing Committee on Environment, Communications and the Arts, *Save our Solar (Solar Rebate Protection) Bill 2008 [No. 2]*, [Report](#), August 2008, p 3.
- ⁶ For an outline of the history of the program see *Save our Solar (Solar Rebate Protection) Bill 2008 [No. 2]*, [Report](#), August 2008, pp 3-4.
- ⁷ A doubling of the maximum subsidy in May 2007 from \$4,000 to \$8,000 resulted in a substantial increase in applicants: Access Economics, [The Economics of Feed-in Tariffs for Solar PV in Australia](#), November 2008, p 14. Industry and climate groups have acknowledged that, due to its popularity, the scheme was not sustainable: *Courier Mail* (10 June 2009), *Age* (10 June 2009).
- ⁸ NSW Solar Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, p 52 (an installed PV system is costed at \$12,500 per each kW). See also Choice, [Solar panels buying guide](#), updated 10 July 2009 (installed 1kW system is costed at around \$10,000 per each kW).
- ⁹ [SGU Owners Guide: RET Process for Owners of Small Generation Units \(SGUs\)](#), pp 5, 13-15, last updated October 2009. Systems in locations with less sunlight are accorded lower values.
- ¹⁰ For an overview, see the article '[How are RECs priced?](#)' on the [Green Energy Trading](#) website. Electricity retailers and large electricity users buy RECs to meet their obligations to purchase a certain proportion of their electricity from renewable sources.
- ¹¹ Amended by the [Renewable Energy \(Electricity\) \(Amendment\) Act 2009 \(Cth\)](#).
- ¹² Commonwealth Department of the Environment, Water, Heritage and the Arts, [Solar Homes and Community Plan – Latest News](#) (webpage).
- ¹³ The calculations have been made by the author of the e-Research Brief.
- ¹⁴ In commodities trading, the 'spot price' refers to the price agreed on for immediate (ie on the spot) settlement (ie payment and delivery) of a commodity: see *The Compact Macquarie Dictionary*, 1994 edn, p 964; Official Nebraska Government website, '[Glossary of Energy Terms](#)'. (On the Green Energy Trading website, the timeframe for 'spot' settlement where RECs are traded on the wholesale market is given as a week: see '[How are RECs priced?](#)') Buyers' and sellers' willingness to enter into a transaction at a given point in time, based on their views of short to medium term demand and supply, determines wholesale spot REC prices: see '[How are RECs priced?](#)'
- ¹⁵ For example, see the [Green Energy Markets](#) website, and the [Green Energy Trading](#) website together with its blog, [Talking Green Energy](#) at <http://www.greenenergytrading.com.au/blog.html> on which the fluctuations in the REC market are regularly discussed. See, for instance, 'REC market shows extreme volatility' <http://www.greenenergytrading.com.au/news-talking-green-energy/market-shows-extreme-volatility.html>, 23 November 2009; 'REC prices increase' <http://www.greenenergytrading.com.au/news-talking-green-energy/rec-prices-increase.html>, 9 November 2009 and 'REC prices continue to plummet' <http://www.greenenergytrading.com.au/news-talking-green-energy/rec-prices-continue-to-plummet.html>,

9 October 2009. These blog entries are also available from the Queensland Parliamentary Library's Online Collections under 'Research Briefs, Reports, Articles, Policies, Transcripts', 'Documents and Articles 2001+'.

16 This Report was compiled for the [Clean Energy Council](#) (industry association with over 300 member companies representing the clean energy and energy efficiency sectors).

17 pp 1 & 8. See also McLennan Magasanik Associates, [Final Report to Victorian Department of Primary Industries: Benefits and Costs of the Victorian FIT Scheme, Revised Report](#), 17 November 2008, p 30.

18 For a breakdown of installation by jurisdiction see: Commonwealth Department of the Environment, Water, Heritage and the Arts, [Systems Installed by State](#).

19 [The Economics of Feed-in Tariffs for solar PV in Australia](#), pp 2, 28.

20 Queensland Office of Clean Energy, [Solar Bonus Scheme Q&As](#), p 2.

21 Office of Clean Energy, [Solar Bonus Scheme](#) (website).

22 For a list of countries, states and provinces that have adopted a FIT scheme up to 2009, refer to: Renewable Energy Policy Network for the 21st Century (REN21), [Renewables Global Status Report](#) (2009 update), p 26 (table R10).

23 [Solar Bonus Scheme Q&As](#), p 1.

24 Choice, [Solar panels buying guide](#), updated 10 July 2009. See also, [Premature end to solar rebate](#), *Courier Mail*, 13 June 2009.

25 See for example, NSW Solar Feed-in Tariff Taskforce in its Report, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, p 11.

26 McLennan Magasanik Associates, [Final Report to Victorian Department of Primary Industries: Benefits and Costs of the Victorian FIT Scheme, Revised Report](#), p 5. The Executive Director of the Queensland Housing Industry Association, Warwick Temby, has criticised the Solar Bonus Scheme on the basis that a 1kW system would not generate enough electricity to export: *Brisbanetimes.com.au* (16 October 2008). For other negative media reports concerning household export potential under the Solar Bonus Scheme see *Sunday Mail* (13 April 2008), *Sunday Mail* (24 August 2008).

27 Access Economics, [The Economics of Feed-in Tariffs for Solar PV in Australia](#), November 2008, p 13.

28 Firecone Ventures Pty Ltd, [Options to increase the uptake of small-scale solar power by Victorian households](#), April 2008, p v. The NSW Solar PV Feed-in Tariff Taskforce estimates that a net FIT of \$0.88/kWh, assuming a 25% export rate, will produce the same payments as a gross FIT of \$0.22/kWh (without taking into consideration savings on electricity bills under a net FIT): [NSW Solar Feed-in Tariff Report to Ministers](#), pp 11-12.

29 The NSW Solar PV Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), 2009, p 6.

30 Department of Parliamentary Services, Parliamentary Library Research Service, [Electricity Industry Amendment \(Premium Solar Feed-In Tariff\) Bill 2009](#), Research Brief No 2, 2009, p 5 citing Victoria Department of Primary Industries, Summary of Key Outcomes from DPS Stakeholder Forum, 2007.

31 The NSW Solar PV Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), p 45.

32 The NSW Solar PV Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), p 53. See also Choice, [Solar panels buying guide](#), p 2, updated 10 July 2009 (expected life should be at least 25 years).

A non discounted payback is a reference to the payback of the original capital outlay without assuming a rate of return on the capital outlay: The NSW Solar PV Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), pp 27-28.

ACT Parliamentary Debates to the Electricity Feed-In (Renewable Energy Premium) Bill 2008 ([2 July 2008](#), p 2579 and ACT Department of the Environment, Climate Change, Energy and Water, 'ACT Electricity Feed-in Tariff Scheme', Fact Sheet, p 1). See also, [Electricity Feed-In \(Renewable Energy Premium\) Bill 2008 \(ACT\)](#) and [Explanatory Statement](#), p 2.

Ministerial Media Statement; [Solar bonus scheme for NSW announced](#), 23 June 2009.

[Final Report to Victorian Department of Primary Industries: Benefits and Costs of the Victorian FIT Scheme, Revised Report](#), November 2008, p 21.

p 21.

pp 25-26.

In 2007, Germany accounted for just over half of global PV installations (followed by Japan, Spain and the United States); and since 2004, has had the highest rate of PV installation in the world: Access Economics, [The Economics of Feed-in Tariffs for Solar PV in Australia](#), pp 19-20. In 2007, about 3.5% of Germany's total renewable energy (itself 14.3% of total grid electricity) was generated from solar PVs: [The Economics of Feed-in Tariffs for Solar PV in Australia](#), p 20.

Access Economics, [The Economics of Feed-in Tariffs for solar PV in Australia](#), pp 20 - 21.

[The Economics of Feed-in Tariffs for solar PV in Australia](#), pp 3 & 19. Global demand for solar PV grew 62% from 2006 to 2007 (Germany, Spain, Japan and US accounted for 86% of world capacity): [The Economics of Feed-in Tariffs for solar PV in Australia](#), p 2.

p 22. See also the comments by the Wilderness Society, WWF Australia and the Queensland Conservation suggesting that Queensland's 'net' FIT scheme would have "...little impact on investment": [Paradise lost?: A review of Queensland Labor Government environmental policies 1998-2008](#), p 5.

The NSW Solar PV Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), p 38; Victorian Government Department of Primary Industries, [Feed-in tariffs in Victoria – Frequently Asked Questions](#), March 2009. See also commentary by the Commonwealth Senate Standing Committee on Environment, [Communications and the Arts, Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#), November 2008, pp 10 - 11; other factors can increase the cost of implementing a FIT scheme such as the duration of the premium FIT, the number of eligible applicants, uptake rates and the size and capacity of installed PV systems.

See for example, Mr Roger Wilkins AO, [Strategic Review of Australian Government Climate Change Programs](#) (the Wilkins Review), 31 July 2008, p 143 (released with the Commonwealth Budget in May 2009).

[Explanatory Notes](#) to the Clean Energy Bill 2008, p 4.

Victorian Government Department of Primary Industries, [Feed-in tariffs in Victoria – Frequently Asked Questions](#).

NSW Solar Feed-in Tariff Taskforce, [NSW Solar Feed-in Tariff Report to Ministers](#), February 2009, p 29.

[Options to increase the uptake of small-scale solar power by Victorian households](#), p 25.

[Options to increase the uptake of small-scale solar power by Victorian households](#), p 26. See also [Australian Financial Review](#) (27 October 2009).

[Solar Power](#) (website).

See for example, *Age* (2 June 2009).

Photovoltaic Working Group of the Sustainable Energy Development Office, [Report to the Western Australian Minister for Energy](#), February 2008, p 17.

Independent Competition and Regulatory Commission, [Feed-In Tariff Discussion Paper – Comments](#), February 2008, pp 2 & 4.

[The Economics of Feed-in Tariffs for solar PV in Australia](#), pp 28-30.

[Strategic Review of Australian Government Climate Change Programs](#), 31 July 2008, p 143.

[Options to increase the uptake of small-scale solar power by Victorian households](#), p iii.

For example see: [submissions](#) to the NSW Solar Feed-in Tariff Taskforce [NSW Solar Feed-in Tariff Report to Ministers](#) (refer also to p 44 of the same report where these submissions are summarised); [submissions](#) to the Senate Standing Committee on Environment, Communications and the Arts, [Renewable Energy \(Electricity\) Amendment \(Feed-in-Tariff\) Bill 2008](#), November 2008 (refer also to p 22 of the same report where a strong stakeholder preference for a gross FIT is noted. See also the Report by the Standing Committee on Environment, Communications and the Arts, [Save our Solar \(Solar Rebate Protection\) Bill 2008 \[No. 2\]](#), August 2008, pp 15-18, where it is observed that support for a national gross FIT came from a range of submissions.

Petition tabled in the Commonwealth Senate by the Australian Greens. See also the petition by the ClimateMovement.org.au (hub for climate action groups) campaigning for a NSW gross FIT: [NSW Solar Feed-in Tariff Cyberaction](#).

Senate Parliamentary Debates, ([Second Reading](#), 13 November 2008, pp 6919-6946).

Both Bills proposed to amend the [Renewable Energy \(Electricity\) Act 2000](#).

Recommendation 6, p 40.

Recommendation 1, p vii.

The South Australian system is currently under review: [South Australia's Solar Feed-in Scheme](#) (website).

Part of the Commonwealth Government's Solar Cities Program to encourage community awareness and uptake of energy efficiency measures such as solar PV generation: [Alice Solar City](#) – Fact Sheet (undated). Other solar cities are located in Adelaide, Blacktown (NSW), Central Victoria, Moreland (VIC), Perth and Townsville.

Western Australia [Sustainable Energy Development Office](#): [A Feed-in Tariff for Renewable Energy Systems](#) (website); Ministerial Media Statement, [State Budget 2009-10: Electricity services](#), 14 May 2009.