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Re: Renewable Energy (Electricity) Amendment (Feed-In Tariff) Bill 2008

This submission concerns a proposal for federal legislation to encourage renewable electricity generators to feed-in their production to electricity distribution networks.

The submission is written on the basis of 18 months of intensive research and review of the international literature and empirical evidence concerning the operation of laws to encourage deployment of renewable energy, conducted at the ANU Centre for Climate Law and Policy. I am a lecturer in environmental law at the Australian National University's College of Law, and also hold an legal practitioner's unrestricted practising certificate in the ACT. I have specialised in environmental, planning and natural resources law since 1991.

It builds upon a conference paper entitled "Legislation to Encourage Renewable Energy Deployment: A Comparative Review" presented to the National Environmental Law Association National Conference, "The Law of Climate Change" held 27-28 March 2008 in Fremantle WA. It also develops points made in presentations I made as an invited speaker at three community forums regarding the Electricity Feed-in (Solar Premium) Bill 2007 (the precursor to the ACT *Electricity Feed-in (Renewable Energy Premium) Act 2008*) in January, February and March 2008 in Canberra.

My submission generally supports the enactment of Senator Milne's Bill, primarily because the weight of international evidence and practical results suggests that Feed-in Tariffs are a superior method by which to offer incentives for the deployment of renewable energy. However some detailed suggestions for amendment based on the international models are made.

I am available to elaborate on this submission by making a verbal presentation to the Committee.

Yours sincerely

James Prest

Executive Summary

"Feed-in" laws require electricity network operators (distributors) to pay independent generators of renewable electricity a premium price over a guaranteed time period for any electricity they feed into the grid.

Although relatively novel in Australia, these laws are in fact the most prevalent model of renewable energy incentive laws worldwide. They have been enacted in more than 41 jurisdictions. They have driven a massive increase in investment in renewables in countries such as Germany and Spain. Germany's feed-in law, introduced in 1990 has led to a massive boom in investment. There was a 3025% increase in its solar capacity from 64 million kWh in 2000 to 2 billion kWh in 2006.

Without a federal feed-in law, Australia is likely to miss out on much of the possible share of rewards from growth industries such as solar photovoltaics - where global grid connected capacity grew by 52% just between 2006 and 2007.

Feed in legislation is necessary if Australia is to produce a more diversified range of clean electricity, reducing our reliance on coal-fired electricity. It would also provide a stimulus for local investment and innovation in renewable technologies. As Sir Nicholas Stern noted "innovation in the power generation sector is the key to decarbonising the global economy."

A purely market-driven approach will ignore technologies that could ultimately deliver huge cost savings in the long term. By not funding alternatives, we will "lock in" high carbon electricity generating capital stock for decades.

We must ensure that a strong, well-designed feed in law is enacted, one which takes account of international best practice.

The following are the key characteristics of international best practice identified in a 2006 survey of 25 EU jurisdictions by the Fraunhofer Institute in Germany:

- FIT's need to be designed to provide continuity and encourage long term investment policy;
- Technology-specific tariff levels should be applied;
- Design should include a purchase obligation;
- Tariff degression should be included to provide incentives for cost reductions; and
- The option of payment of a premium on wholesale market prices rather than a fixed price should be included.

Passage of a national feed in law that builds upon the features of the strongest Australian feed-in law yet enacted, in the ACT, would assist the Federal Parliament in demonstrating leadership on global warming. When we look at the other jurisdictions which have enacted far weaker FIT laws, such as SA, Victoria and Queensland, it seems that some interests are concerned scared that renewable energy feed-in legislation might work *too well*.

The FIT law should provide a guarantee of return to investors over a 20 year period, high enough tariffs to provide an attractive incentive (ie a relatively brief payback period on capital investment), and should apply across a broader range of technologies and contexts than just residential solar PV installations.

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I. INTRODUCTION

Feed-in tariffs (FiT, Feed-in Laws or Solar Premiums) are laws that create an incentive for the deployment and generation of renewable energy by obliging electricity grid operators to purchase renewably generated electricity at premium, above market rates, usually over a guaranteed time period.¹ They are described as 'feed-in' laws as they encourage renewable generators, including small generators, to feed excess electricity into the grid. The legislation seeks to create incentives for generation by small and medium sized generators, as opposed to the emphasis on large projects given by tradeable certificates legislation – in Australia known as the MRET law. Thus it places a high value on building a more diversified generation network. Feed-in laws provide that for each kWh of electricity from RE technologies, the producer receives a premium price, above the market rate or standard retail tariff. The premium prices are fixed by Government, and may be revised on an annual basis in such a way that the new rate applies to new RE installations after that date. The additional expense associated with feed-in laws is passed on by distributors or grid operators across all electricity consumers via a very slight increase in billing proportional to consumption.²

The structure of this submission is as follows: Section II provides information about the prevalence of feed-in legislation worldwide and briefly sets out the German experience as an example of the results that can be achieved via this form of renewable support legislation. Section III makes a comparative evaluation of feed-in laws as a policy instrument when compared to the alternative of quantity based regulation in the form of tradeable certificate laws. Section IV traverses the arguments surrounding the interaction of emissions trading schemes with renewable energy support legislation. Section V describes existing feed-in laws in Australian state and territory jurisdictions and draws attention to their key features. This discussion is elaborated upon in an Appendix. Section VI provides a detailed discussion of pros and cons of the various possible design features of feed-in laws, and applies this discussion to the Bill under consideration. Section VII summarises the discussion of renewable energy support legislation. It returns to the possibility of feed-in laws co-existing with the existing MRET tradeable certificate legislation.

¹ The term tariff refers to the price paid per unit, or kilowatt-hour (kWh) of electricity that is fed back into the electricity grid.

² Ragwitz, M. & Huber, C. (2005) 'Feed-in systems in Germany and Spain and a comparison', Germany: Fraunhofer Institut für Systemtechnik und Innovationsforschung at 8.

II. ABOUT FEED-IN LAWS

Varying forms of feed-in tariffs are in place in at least 48 jurisdictions across the world. Whilst there are different designs of FITs, they typically share a number of distinguishing features. First, they offer an above-market or premium price for the generation of renewable electricity. The price is set at a level and for a duration which creates a sufficiently profitable investment in renewable generation equipment at a particular site. Many pricing variations exist. For example, German legislation guarantees a fixed payment based on a system's generation cost, distinguishing between different RE technologies/ sources, whereas under FIT laws in Spain, generators can choose between a fixed payment or a fixed premium paid on top of the spot market price.³ The Spanish model of premium tariffs is also applied in the Czech Republic, Slovenia, the Netherlands and Denmark (for onshore wind energy).⁴

Secondly, feed-in tariffs also require utilities to provide renewable generators with a long-term fixed price for electricity. The importance of the long-term nature of the price guarantee is that this creates certainty for investors, as the future return from an RE project can be forecast more readily. With certainty, greater levels of investment are more likely.

Thirdly, FIT laws require utilities to connect all eligible renewable generation, so that RE can be fed into the grid. This feature addresses a significant barrier to market entry, which can be the unwillingness of grid operators to interconnect small and medium sized RE generation sources, as has been the experience in some cases under the MRET scheme, for example in South Australia.

The international prevalence of FIT laws

According to the *Renewables 2007: Global Status Report*, by the international agency REN21, 36 countries and 10 states/provinces, including 12 developing countries, have adopted feed-in tariff policies for renewable electricity, more than half of which have been enacted since 2002. The alternative model, of renewable-portfolio-standard (RPS) legislation, has been enacted in 44 countries, states, and provinces.⁵

³ Pablo del Rio & Miguel A. Gual (2007) "An integrated assessment of the feed-in tariff system in Spain" 35 *Energy Policy* 94–1012.

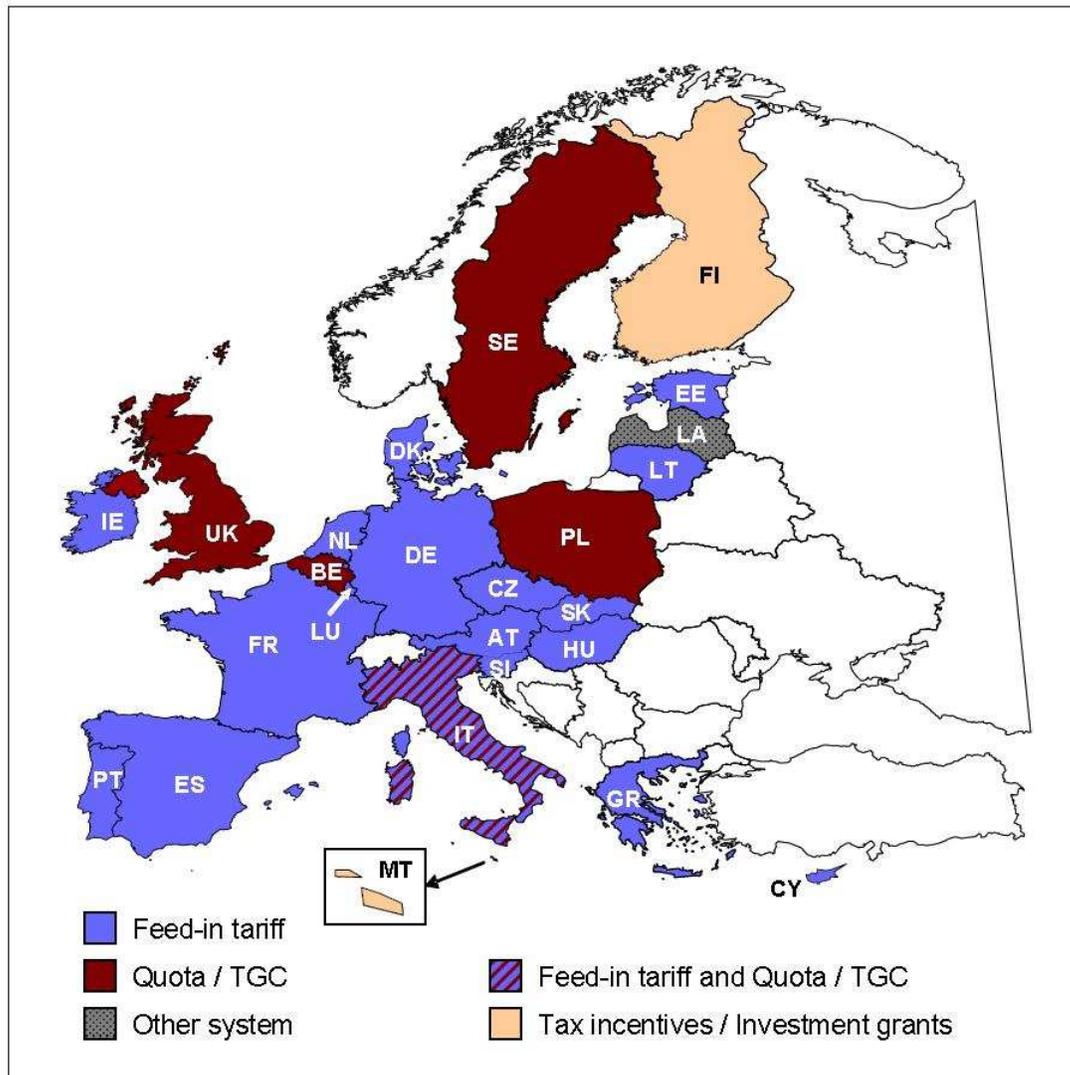
⁴ Arne Klein, Anne Held, Mario Ragwitz, Gustav Resch, Thomas Faber (2006), *Evaluation of different feed-in tariff design options - Best practice paper for the International Feed-in Cooperation*, A research project funded by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Fraunhofer Institute, Germany, p.10; (Hereafter: Klein et.al.).

⁵ REN 21(2007) *Renewables 2007: Global Status Report*, Table R10 at 43.

Countries with feed-in laws include the following: Australia, Austria, Brazil, Canada, China, Cyprus, the Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Israel, Italy, the Republic of Korea, Lithuania, Luxembourg, the Netherlands, Portugal, Singapore, Spain, Sweden, Switzerland. In the United States, Michigan, Illinois, Minnesota, Rhode Island, Washington, New Mexico, Wisconsin and California have all adopted forms of feed-in tariffs. At the US Federal level, a Feed in Bill, for the *Renewable Energy Jobs and Security Act*, by Rep. Jay Inslee is before the Congress.⁶

⁶ http://www.house.gov/apps/list/press/wa01_inslee/renewableenergypayments.shtml; Pierobon, J. , "US Rep. Inslee Introduces Renewable Energy Pricing Legislation", *Renewable Energy World*, 27 June 2008.

Figure 1: Legislation for the Support of Renewable Energy in the EU-25 countries (at Sept 06)



Source: Klein, et.al. , p.8.

Figure 1 shows that the majority of EU-25 countries have FIT laws in place, and that TGC laws are less popular as a means of incentivising RE.

Table 1 : Cumulative Number of Countries/States Enacting Feed-in Policies

Year	Cumulative Number	Countries/States/Provinces Added That Year
1978	1	United States (PURPA)
1990	2	Germany
1991	3	Switzerland
1992	4	Italy
1993	6	Denmark, India
1994	8	Spain, Greece
1997	9	Sri Lanka
1998	10	Sweden
1999	13	Portugal, Norway, Slovenia
2000	14	Thailand
2001	16	France, Latvia
2002	20	Austria, Brazil, Czech Republic, Indonesia, Lithuania
2003	27	Cyprus, Estonia, Hungary, Korea, Slovak Republic, Maharashtra (India)
2004	33	Italy, Israel, Nicaragua, Prince Edward Island (Canada), Andhra Pradesh and Madhya Pradesh (India)
2005	40	Turkey, Washington (USA), Ireland, China, India (Karnataka, Uttaranchal, Uttar Pradesh)
2006	41	Ontario (Canada), Argentina, Thailand
2007	46	South Australia (Australia), Croatia
2008	48	Australian Capital Territory, Queensland.

Source: REN 21, *Renewables 2007: Global Status Report*, plus authors additions for 2008.⁷

⁷ Retrieved from http://gsr.ren21.net/index.php?title=2006_Table_7

Likely growth of renewable industry under FIT laws

The most commonly cited example of a successful feed-in law is that of Germany, the *Erneuerbare-Energien-Gesetz* (EEG) law. Amended at least three times, this law was one of the first feed-in laws after the United States, which introduced a form of feed-in law (known as PURPA) as long ago as 1978.⁸

Germany's feed-in law, introduced in 1990, led to a massive boom in investment in RE generation capacity. Germany met its 2010 target of 12.5% renewable electricity three years ahead of schedule.⁹ The boom attributed to the FIT law was exemplified by growth in solar PV generation capacity. There was a 3025% increase in its solar capacity from 2000 to 2006; from 64 million kWh in 2000 to 2 billion kWh in 2006. The tariff is largely responsible for the doubling of share of total electricity from renewables: from 6.3 % in 2000 to 12.0 % in 2006. The legislation is estimated to have saved nearly 100m tons of CO₂ annually, and led to records being set for installed capacity across many technologies. For example, significant growth in solar generation is evident from 64 million kWh in 2000 to 2 billion kWh in 2006. In 2007 alone, Germany installed approximately 50% of annual global PV installations.¹⁰

The size of the boom in Germany is evident from the fact that € 9 billion was invested in renewables installations in 2006, and 125,000 jobs directly attributable (of a total of 215,000 in RE sector). The BMU states that the total turnover from renewable energies in Germany increased to approx. 24.6 billion euros in 2007, almost 10 % more than the previous year. As recently as 2000, the sector's total turnover was only approximately 7 billion euros.¹¹

The German Renewable Energy Law is considered the benchmark for photovoltaic (PV) policies in the EU. The German PV market experienced a 10-fold increase in four years from 1999-2003. The success of the legislation in encouraging deployment of PV and other RE technologies is commonly attributed to the long term price guarantees offered to investors (20 years). Other

⁸ The *Public Utility Regulatory Policies Act of 1978 (PURPA)*, required electricity utilities to purchase electricity from independent renewable energy generators.

⁹ Böhme, D., Dürschmidt, W., van Mark, M., Staiß, F., Linkohr, C., Musiol, F., et al. (2008). *Development of renewable energies in Germany in 2007*. Berlin, Germany: Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit.

¹⁰ European Photovoltaic Industry Association (2007) *Supporting Solar Photovoltaic Electricity: An Argument for Feed-in Tariffs*, p.1 (www.epia.org).

¹¹ Development of Renewable Energies in Germany in 2007, 12 March 2008, Data of the German Federal Environment Ministry (BMU) on the development of renewable energies in Germany in 2007 (provisional figures) on

factors include priority access to the electricity network, the generosity of the tariffs, the encouragement of small and medium sized investors, and method of attributing liability for grid upgrades.

the basis of information compiled by the Working Group on Renewable Energies – Statistics (AGEE-Stat) at 7.
http://www.bmu.de/files/pdfs/allgemein/application/pdf/ee_hintergrund2007_en.pdf

III. EFFECTIVENESS OF FEED-IN LAWS COMPARED WITH TRADEABLE QUOTAS

The answer to the question "What is the most effective type of renewable energy laws?" actually depends on the detail of the goals and criteria that have been adopted, or more likely, simply assumed. The most commonly assumed goal, at least in Australia, is of least cost generation of RE. A common theoretical assumption is that the MRET/ RPS model will induce RE production at lower cost and thus produce a result that is more economically efficient. This is said to occur due its promotion of competition between RES producers, leading to maximum RE generation at minimum aggregate social cost. There is a related - but different - goal of maximum abatement of GHG emissions at least cost. Additional goals include maximum deployment, reduced risk for investors, building a diversified portfolio of RE generating sources, increased employment, least complexity and administrative costs.

In Australia, legislators and policy makers at the Commonwealth level have shown an ideological preference for MRET/RPS approaches over other RE models. The RPS is seen as the most "market based" mechanism available to encourage RE. As Toke and Lauber have observed "'Market-based' is used by the advocates of such systems to connote a supposedly greater role for competition."¹² A similar attitude was evident in the UK, explaining the selection of the RPS model for the Renewables Obligation. Interviews showed that "Government ministers made it clear to their civil servants that any scheme promoting renewable energy had to involve a 'maximum of competition', and that FIT [feed-in tariff] systems were ruled out."¹³

Examination of the Parliamentary debates on the Bill to introduce the RPS law in Australia (MRET) (June 2000) reveals that very little, if any, of the debate concerned alternatives to the tradeable certificate model.¹⁴

There has been little if any direct debate over the relative merits of FIT and MRET approaches in Australia.¹⁵ Much of the Australian discussion that is relevant comes from submissions to various Senate Inquiries,¹⁶ to the Recent Task Force Report on Emissions Trading, the Garnaut

¹² Toke, D.; Lauber, V. (2007) "Anglo-Saxon and German approaches to neoliberalism and environmental policy: The case of financing renewable energy" 38(4) *Geoforum* 677-687 at 688.

¹³ Ibid, interview with senior civil servant at the UK Department of Trade and Industry, 23/11/1999.

¹⁴ Renewable Energy (Electricity) Bill 2000, Hansard, 22 June, 2000, p. 18030 et seq.

¹⁵ One exception is Prest, J. (2008), "Hesitancy on feed-in law adds to climate miseries", Opinion Piece, *Canberra Times*, 5 March 2008. <http://canberra.yourguide.com.au/articles/1196061.html>

¹⁶ Senate Environment, Communications, Information Technology and the Arts Committee (2005) *Lurching Forward, Looking Back - Budgetary And Environmental Implications Of The Government's Energy White Paper*, Inquiry Report, May. http://www.aph.gov.au/senate/Committee/ecita_ctte/energy_white_paper/report/index.htm

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Review, and submissions in response to State level proposals for Feed-in laws. Working from this material it is apparent that those who favour the MRET approach and least-cost greenhouse abatement, criticise feed-in tariffs as not representing an example of least cost abatement. FIT laws would also be said to breach the micro-economic taboo on 'Picking Winners'.

In Australia, the UK, and the USA, there is a distinct preference amongst environmental policy makers and bureaucrats heavily influenced by neo-liberal economic agendas for tradeable certificate renewable energy laws above feed-in tariffs. This preference is grounded in a theoretical assumption that RPS laws can provide RE generation at least cost. Associated with it is the firmly held conviction that national introduction of FIT laws is unthinkable as it would inevitably lead to less cost-efficient outcomes.¹⁷ Markets very rarely meet the ideal of perfect competition. Yet the assumption remains that even a partially competitive market will produce a more efficient use of resources compared to a fixed price system.¹⁸

Market advocates predict that certificate/quota laws will produce least cost RE generation and the cheapest way for society collectively to meet a renewable energy target. This is said to be because of more intense competition between RE generators to fill the quotas. If suppliers of RE do not offer a competitive price for RE, no-one will buy their electricity. Therefore they are forced by competitive pressures to avoid rent-seeking pricing strategies.¹⁹ The aim of the certificate market is to minimise producer surplus.

A related justification frequently advanced is that tradable green certificate laws are more "market-oriented" than feed-in tariffs. This is not accurate. As the European Commission put it in 2005, 'both instruments are equally market-based, in that the regulatory body sets either the price or the quantity and leaves the determination of the other to the market'.²⁰ Hvelplund has described this preference for TGC/quotas as representing a more thoroughly "market" mechanism than FIT laws as a "delusional" ideologically based preference.²¹ It can be said to be delusional because TGC laws still rely upon a political decision or 'intervention' – this time as to what quantity of renewable electricity is to be produced. It is also delusional because the

¹⁷ Toke & Lauber (2007) op.cit. at 677

¹⁸ Toke, D. (2006) "Renewable financial support systems and cost-effectiveness" 15 (3)*Journal of Cleaner Production* 280-287.

¹⁹ Toke & Lauber (2007) op.cit. at 680.

²⁰ European Commission, 2005b. Commission Staff Working Document. Annex to the Communication from the Commission The support for electricity from renewable energy sources, impact assessment. COM8 (2005) 627 final of 7 December, p. 54.

²¹ Hvelplund, F. (2005) "Renewable Energy: Political Prices or Political Quantities", in Volkmar, Lauber, (ed.) *Switching to Renewable Power*, Earthscan at 231.

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market in REC certificates has been artificially created as the product of government intervention.

Although arguments for quota systems are intuitively attractive, a large body of work from Europe has reviewed the evidence regarding the relative results in practice. They have come to opposite conclusions to what might have been expected - that feed-in laws have been capable of inducing/ encouraging production of greater amounts of RE more cost-effectively than quota legislation.²² The Stern Review surveyed the literature on the subject and concluded:

“Comparisons between deployment support through tradeable quotas and feed-in tariff price support suggest that feed-in mechanisms achieve larger deployment at lower costs.”²³

Prof. Volkmar Lauber of the University of Salzburg, Austria, conducted a survey published in 2006 which reviewed the evidence concerning the relative effectiveness of the two models of RE law. He concluded that:

“the stark fact is that up to now, there has been no experience in Europe with a quota/TGC system that can claim a performance with regard to cost-efficiency, innovation, or deployment, which is superior to a good REFIT system.”²⁴

So how can we explain these results in relation to cost-efficiency? The key point is that under TGC systems, investors typically perceive higher levels of uncertainty and risk (than under FIT laws). These higher levels of risk increase the cost of borrowing for investment, and in turn this acts to retard the levels of investment in deployment of RE generating capacity. The basic principle is explained by Ragwitz and Held as follows:

“The dissemination effectiveness of energy policy instruments depends significantly on the credibility of the system for potential investors. It must be guaranteed that the promotional strategy, regardless of which instrument is implemented, persists for a specified planning horizon. Otherwise the uncertainty for potential investors is too high.”²⁵

²² Lauber, V. (2006) “Tradeable Certificate Schemes and Feed-in Tariffs: Expectation versus Performance”, ch.12 in Lauber, Volkmar (ed.) (2006) *Switching to Renewable Power*, Earthscan, at 258.

²³ HM Treasury (2006) *The Stern Review*, Cambridge University Press at p. 417 (hereafter 'Stern Review') citing Butler and Neuhoff (2005), ERC(2005), Ragwitz and Huber (2005) Fouquet et al (2005); as follows: Butler, L. and K. Neuhoff (2005): 'Comparison of feed-in tariff, quota and auction mechanisms to support wind power development', Cambridge Working Papers in Economics 0503, Faculty of Economics (formerly DAE), Cambridge: University of Cambridge; Ragwitz, M. & Huber, C. (2005): 'Feed-in systems in Germany and Spain and a comparison', Germany: Fraunhofer Institut für Systemtechnik und Innovationsforschung; Fouquet D., C. Grotz, J. Sawin and N. Vassilakos (2005): 'Reflections on a possible unified eu financial support scheme for renewable energy systems (res): a comparison of minimum-price and quota systems and an analysis of market conditions'. Brussels and Washington, DC: European Renewable Energies Federation and Worldwatch Institute. ERC European Community (2005): 'The support of electricity from renewable energy sources', Communication from the Commission available from http://ec.europa.eu/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_electricity_en.pdf

²⁴ Lauber, Volkmar (2006) *Switching to Renewable Power*, Earthscan, at 260.

²⁵ Held & Ragwitz, op.cit., at 865.

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As was observed by an EU survey of RE laws in Europe in 2005, a fundamental concern regarding RE laws is

“any stop-and-go nature of a system. Any instability in the system creates high investment risks, normally taking the form of higher costs for consumers. Thus, the system needs to be regarded as stable and reliable by the market participants in the long run in order to reduce the perceived risks.”²⁶

Under RPS laws there is less medium to long range certainty for investors, for several reasons. Once a quota for RE generation has been achieved, then the target ceases to exert any incentive effect, as the quota has been filled. Without the support of the RPS law, producers of RE power again are forced to compete on an un-level playing field against climate-subsidised coal fired generation (in the absence of a strong carbon price).

This inevitability with the quota method means that there is reluctance on behalf of investors to get involved in the first place. There are market perceptions of uncertainty of duration of the system and market perceptions about the future price of RECs, and the price of electricity.

Held and Ragwitz reviewed the European data and observed:

“It is striking that Italy, the UK and Belgium, which have recently transformed their markets using quota systems as the main support instrument, are characterised by high expected levelised profits but low effectiveness...the results show that certificate systems lead to higher producer revenues than FITs, which compensates for high investment risks.” The fact that expected profitability is significantly lower for FITs is directly linked with a higher efficiency of this strategy because additional costs for consumers are lower.”²⁷

Ragwitz et al concluded that “a well-designed (dynamic) FIT system provides a certain deployment of RES-E in the shortest time and at lowest costs for society.”²⁸ They explained that under an FIT system there is lower risk, and thus the profitability demanded by investors is “much lower” and as a result, so are the additional costs finally paid by all customers in their electricity accounts.²⁹

Summary of benefits of FIT

Feed-in laws have catalysed considerable instalments of renewable electricity in those jurisdictions where major administrative, planning law or grid access barriers have not been

²⁶ European Commission (2005) “The support of electricity from renewable energy sources: Communication from the Commission, No. {SEC(2005) 1571}, Brussels, 7.12.2005, COM(2005) 627 final, at p.16

²⁷A. Held, M. Ragwitz and R. Haas (2006) “On the Success of Policy Strategies for the Promotion of Electricity from Renewable Energy Sources in the EU” 17 (6) *Energy & Environment* 849-868 at 860.

²⁸ Ibid.

²⁹ Ibid, at 865.

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erected or maintained.³⁰ Secondly, the transaction costs and administrative costs are low compared to RPS or TGC laws. Due to the guaranteed rate, they reduce risks for new investment, thus encouraging more investment. Thirdly, they allow cooperatives and companies to participate. This may possibly reduce 'NIMBY' resistance to renewable energy developments.

A fourth factor differentiating them from tradeable certificate laws is that they apply across a range of technology bands, providing differential assistance. Thus they promote technologies that are further from market competitiveness. This enables the peak power and network benefits of technologies such as solar PV to be captured.³¹ This benefit of solar energy was noted in 2004 by the Federal Government's Energy White Paper:

"As a form of distributed generation, solar energy can reduce the need for transmission and distribution infrastructure – something not fully attributed in the market. Peak output from solar energy often coincides with peaks in demand for electricity, generally hot days with high air conditioner usage. Wholesale prices for electricity in these periods can be 100 times the average. Current electricity market arrangements do not appropriately reward these benefits of solar technologies, nor do they provide appropriate price signals for energy efficiency."

FIT laws recognise the network benefits from reduced transmission losses and generation closer to the source of consumption; and the economic benefits through lowering of peak wholesale electricity prices.³² The network and transmission benefits of distributed generation are positive externalities not normally taken into account in consideration of whether feed-in laws provide 'least cost' abatement.

Effectiveness of the MRET approach

This section discusses the Australian experience with its own form of tradable renewable energy certificate law, the *Renewable Energy (Electricity) Act 2000*. The international literature suggests that one of the typical shortcomings of RPS laws are that often they lead to stop-go cycles of investment. This is because the targets in practice to set upper limits for development. This is because it is unprofitable to install beyond the quota limit. The Australian experience has

³⁰ Ragwitz, M. and C. Huber (2005) 'Feed-in systems in Germany and Spain and a comparison', Germany" Fraunhofer Institut für Systemtechnik und Innovationsforschung at 17.

³¹ Australian Business Council for Sustainable Energy, *Submission on Driving Investment in Renewable Energy in Victoria - Options for a Victorian Market-Based Measure*, January 2006

³² This is described by the German Department responsible, the BMU, as the "merit order" effect: "The fact that priority is given to the feed-in of renewables will in the short term lead to a lowering of electricity prices on the wholesale market... Because priority is given to EEG feed-in, demand for conventional electricity is reduced. In accordance with the merit order, therefore, the most expensive power plants are no longer needed to meet demand, and the market price falls accordingly. This effect is also known as the merit order effect... the calculated merit order effect for the year 2006 is in the region of 5 billion Euros." BMU, 2006, p.27. The report continues "The current best estimate of the cost of climate damage arising from this is around 70 Euros/t CO₂.... the external costs avoided in the electricity sector thanks to renewables can be estimated at 3.4 billion Euros minimum. This is considerably higher than EEG expenditure to promote renewables over the same period (3.2 billion Euros), indicating that the promotion of renewable energy sources via the EEG is worthwhile purely in terms of the avoided external costs alone." p.28.

been consistent with these international observations. Initially, in Australia, the official Howard government line was that MRET was very successful. Certainly a wind power boom took place, resulting in an additional \$3 billion in investment in RE capacity.³³ As was described by Wahlin, "the scheme was so successful that its fifteen year life span was quickly subscribed....By about 2004 there was a recognition that it was working very well, but there was going to have to be some kind of an extension to it ... to allow that growth to continue over time'.³⁴ However, despite an independent inquiry (the Tambling Inquiry) recommending that MRET be doubled (from 9500GWh to 20,000 GWh) and extended to 2020, for various spurious reasons of "economic impact" (said to involve \$5 billion in 'subsidies'), the MRET was not expanded or extended. By 2005, the 2010 MRET target for renewables had already been achieved. As a result was no longer exerting any incentive effect on investment in renewables. The wind industry faced substantial difficulty due to the Howard government's decision not to expand and extend MRET. By August 2005, key players in the wind industry in Australia had already publicly declared that they were considering whether they would take their investment dollars elsewhere. These included the Danish wind energy giant Vestas, Britain's Renewable Energy Systems, and the Belgian turbine gear box manufacturer Hansen. The Asia-Pacific president of Vestas, Thorbjørn Rasmussen said that the company felt a lack of a viable long-term policy supporting wind and renewables was leading it to look towards locating in countries that "are more supporting of renewables, such as China and the US", he said.³⁵ In May 2006, industry representatives said the decision not to extend MRET was threatening \$12 billion of proposed wind investment.³⁶ In that year, many wind projects were either postponed or cancelled. The industry soon began to stall, an impact which has been slightly lessened by the operation of Victoria's 10% RET law. With steady growth in electricity use across Australia, there has in fact been a decrease in renewables' share of total electricity produced, despite increases in wind generation.

The need for laws to create a diversified portfolio

A neglected question is whether renewables legislation should be primarily directed at encouraging the least cost renewable technologies, i.e. those which are closest to market competitiveness (e.g. wind). Alternatively, should it seek to encourage *all* renewable technology

³³ Business Council for Sustainable Energy (BCSE) and AGL "Demonstrating that the market works for renewables", *Media Release*, Canberra 27.10.06.

³⁴ Wahlin, W. (2006) "Powering up a nation: Energy security in Japan and Australia", *Aust Review of Public Affairs*, 12 November 2006 <http://www.australianreview.net/digest/2006/11/wahlin.html>

³⁵ Frew, W. "We're fast running out of puff, energy firms warn", *SMH*, August 19, 2005.

³⁶ Frew, W. "Cold air blown on wind farmers", *SMH*, May 12, 2006.

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bands, such as solar PV?³⁷ In Australia, the dominant public policy position, expressed through the REE Act is very similar to that in the UK. In that context Toke and Lauber observed:

“The Renewables Obligation (RO) is intended, primarily, to achieve ambitious targets for renewable energy deployment at a low cost and with available technologies, rather than promote the development of technologies such as wave power which require a firm commitment of subsidies for a longer time period.”³⁸

One of the key shortcomings of certificate/RPS laws, according to the international literature, is lack of diversity in renewable sources supported. Lauber reviewed the experience in the UK by comparison with Germany and concluded: “As expected there is little diversity of renewable power technologies on the market as there is little incentive to invest in technologies other than the cheapest, that is, wind power.”³⁹

The following discussion details how the Australian experience has been consistent with these international observations. As is shown below in Figure 2 (Bar Chart) the MRET scheme has also favoured the cheapest renewable technology, wind power, above other less competitive technologies such as solar PV. The Bar Chart shows that in 2007 most RECs (renewable energy certificates) were created by hydro, wind, and solar hot water (deemed). It also illustrates the point that very few RECs were created by solar PV or by small wind generation units. The results of 2007 continued earlier trends. A review of the REC market for the Office of the Renewable Energy Regulator by the consultants McLennan Magasanik published in late 2007 stated that hydro-electric, solar hot water and wind were the major contributors to meeting the REC targets over the period 2001-2006.⁴⁰

Figure 2:

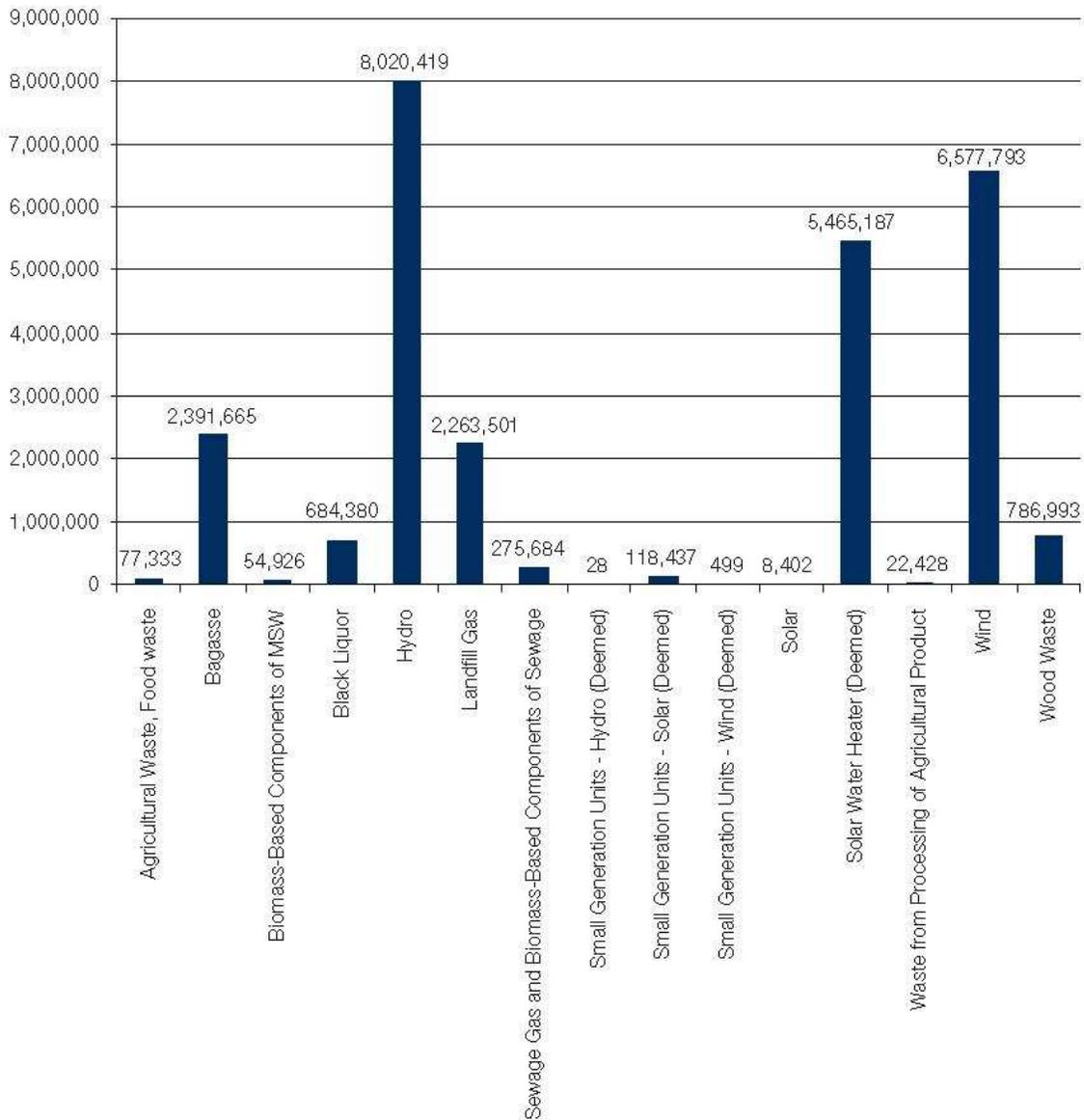
³⁷ Komor, P. (2004) *Renewable Energy Policy*, iUniverse, Inc, p.153.

³⁸ Toke and Lauber, op.cit.

³⁹ Lauber, V. (2005) “Tradeable Certificate Schemes and Feed-in Tariffs: Expectation versus Performance”, ch.12 in Lauber, V. (ed.) *Switching to Renewable Power*, Earthscan, at 258.

⁴⁰ McLennan Magasanik (MMA) Report to Office of the Renewable Energy Regulator: Review of REC Markets 9 October 2007, 40pp. at p.16. <http://www.orer.gov.au/publications/pubs/modelling-2007.pdf>

RECs Created by 31 December 2007 by Eligible Renewable Energy Sources¹

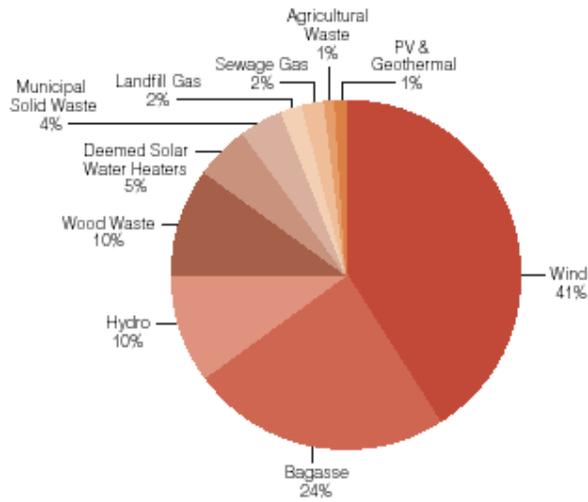


Source: Office of the Renewable Energy Regulator (2007) *Annual Report 2007*, p. 14

These trends are set to continue if we accept predictions made by the Tambling Review. This is illustrated by Figure 3, the Pie Chart from the Tambling Review Report (2003) showing the projected mix of renewable sources in 2020 if MRET were to be expanded (in accordance with setting proposed at the time). The Review projected that by 2020, under the proposed extension and expansion of MRET, that wind power would come to dominate the renewables sector, up from an 11% share in 2003, to holding 41% by 2020. The chart suggests that wind will come to dominate the renewables sector. It shows projected growth in solar from less than 1% to just 1% of renewable market share.

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Figure 3: Share of renewable generation by fuel, under Tambling Review proposed settings, 2020



Source: Tambling Review, p.xxiv.

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The explanation appears to be that under MRET/ RPS laws there is no incentive to invest in technologies other than the cheapest – which is typically either biomass or wind power. On this basis they tend to limit technological diversity, as least cost technologies such as large scale wind farms are favoured, at the expense of solar PV, for example.⁴¹ Because they favour least cost technologies, they contribute little to the early phases of renewable technology development.⁴² It seems fair to conclude that the MRET is a fairly blunt instrument as it does not differentiate between different bands of renewable technologies, particularly those technologies that are further from market competitiveness, such as solar PV.

Even if it is accepted that MRET has led to substantial wind industry growth in Australia, ignoring for a moment the investment crash in 2005-2006, the argument could also be made that the expansion of the RE industry in Australia could have been that much greater, across a far more diversified range of RE sources, had feed-in laws been enacted. This remains speculation but the overseas experience is informative and should not be discounted.

Feed-in laws differ substantially from tradeable certificate laws because they offer a range of differentiated or banded incentives to a range of renewable generation technologies. In other words, greater levels of support are offered to more expensive technologies such as solar PV, and lower levels of support are offered to wind power. In this way, FIT laws promote RE technology development “even at early stages and across a broad technological and geographical spectrum. To use harmonisation to eliminate all but RPS systems is to ignore a key requirement of a rapid transition to renewable energy. The coexistence of state-of-the-art models of both schemes is likely to be more helpful.”⁴³

It is important to explore the justification for such a policy approach. It is that a rational response to situations involving uncertainty of returns is to develop a portfolio of measures.⁴⁴ There are economic benefits in taking a portfolio approach, as there is an economic value (an “option value”) in having a range of options available to develop a spread of energy alternatives.⁴⁵ The Stern Review stated: “A diverse portfolio of investments is required, as it is uncertain which technologies will prove cheapest and constraints on individual technologies will ensure that a mix is necessary. Those technologies that are likely to be the cheapest warrant more investment and *these may not be those that are the currently the lowest cost*. This

⁴¹ Lauber, V. “REFIT and RPS: options for a harmonised Community framework”, 32(12) [Energy Policy](#) August 2004, Pages 1405-1414

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Stern Review, p.407

⁴⁵ Ibid, p.407.

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requires a reorientation of public support towards technologies that are further from widespread diffusion."⁴⁶

⁴⁶ Ibid, p.423.

IV. INTERACTION WITH EMISSIONS TRADING

With emissions trading already selected as the central tool of greenhouse mitigation policy and law in Australia and New Zealand, a key question is its future interaction with renewable energy laws. The timetable for commencement of a domestic emissions trading system in Australia has been brought forward two years, to 2010 (from the 2012 deadline set in the last days of the Howard government).⁴⁷

Opponents of renewable energy have seized upon the imminent introduction of emissions trading legislation in Australia to provide further justification for their opposition to renewable energy legislation. In 2007, the Emissions Trading Task Force report recommended the phasing out of existing renewable energy laws and suggested that no more be enacted. It bluntly stated "All Australian schemes that set mandatory targets for deployment of particular technologies should be wound up over time, and new ones forestalled".⁴⁸ The Task Force derided the Commonwealth MRET scheme for "impos[ing] significant economic costs for relatively modest abatement outcomes."⁴⁹

Since then, in August 2008, the Australian Industry Group, in its submission to the COAG paper on *Design Options for the Expanded RET scheme*, called for the scrapping of the MRET describing it as "an ill advised and risky policy proposal that is likely to significantly increase the cost of greenhouse gas abatement". In doing so it endorsed submissions made in May 2008, by the Productivity Commission to the Garnaut Review.⁵⁰ The Productivity Commission's submission asserted that the case for RE laws was "weak".⁵¹ It emphasised "an overarching objective" of the achievement of GHG targets "at least cost". It proceeded to conclude: "This necessitates the abolition of other climate change initiatives that, in the presence of an ETS, no longer contribute to additional, or lower cost, abatement."⁵²

Four main arguments were advanced by the Productivity Commission. The first was an assertion that RE legislation increases abatement costs but leaves overall GHG emissions unchanged. Observation of the German experience demonstrates the essential untruth of the

⁴⁷ Pearce sets out the record of delay on the introduction of ETS by the Howard government: see: *High and Dry*.

⁴⁸ The report continues: "This would suggest that the Australian Government's Mandatory Renewable Energy Target and the Queensland 13 per cent Gas Scheme should be wound up in line with the time frame set out in current legislation. The potential to abolish the Victorian Renewable Energy Target Scheme should be examined given that the recent commencement of the scheme means less investment has been undertaken, while the recently announced NSW, WA and SA schemes should not proceed." (p.137)

⁴⁹ ETS Task Force report, p.37.

⁵⁰ AIG Submission on National Renewable Energy Target Scheme, 18 August 2008, www.aigroup.asn.au.

⁵¹ Productivity Commission (2008) *What Role for Policies to Supplement an Emissions Trading Scheme?: Productivity Commission Submission to the Garnaut Climate Change Review*, May.

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Productivity Commission's assertions regarding impacts on overall emissions. According to the BMU : "In 2006, around 100 million tonnes of CO₂ were avoided through the use of renewable energies." This means that without their use, total CO₂ emissions (approx. 796 million tonnes) would be around 13 % higher.⁵³ FIT legislation may actually achieve more in terms of abatement than an ETS. This will be particularly the case if the price signal sent by the ETS is diluted by exemptions, compensation, international linkage, and lengthy phase-ins.

The second argument was that the case for deployment support additional to any provided by an ETS is weak on the basis of a view that there are "limited spillovers" from such support. Yet this assumption that positive externalities (spillover benefits) will be limited is unreliable. The German experience again indicates the opposite is likely, with very significant environmental and economic benefits in Germany including employment and industry development. In 2006 the BMU estimated the benefits of the German FIT law (the EEG) as including avoidance of external costs of electricity generation arising from climate change and air pollutants in the order of € 3.4 billion.⁵⁴ This was higher than EEG expenditure to promote renewables over the same period (3.2 billion Euros). Thus the promotion of renewable energy sources via the EEG was worthwhile in terms of the avoided external costs alone.⁵⁵

The third argument is that renewable energy support laws demonstrate the willingness by governments to interfere with the objective of the ETS, thereby encouraging further rent-seeking.⁵⁶ However the ultimate objective of the ETS should be environmental protection rather than limited actions selected on the basis of their least cost characteristics. In any case the Federal government has already demonstrated its willingness to interfere with the ETS by encouraging rent seeking and compensation seeking. For example, the Commonwealth Green Paper in Chapter 10 concerning so-called "strongly affected industries" advocates direct assistance to coal fired generators.⁵⁷ A particular objective is to "underpin the investment environment in the sector" by providing so-called 'compensation' to coal fired generators.⁵⁸ Reimbursement of this sector will dilute the impact of the ETS and will also increase the emissions reduction burden elsewhere in the economy.

⁵² Ibid, p.xx.

⁵³ BMU - Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2007) *Renewable energy sources in figures – national and international development - June 2007*, p.19. www.bmu.de/english

⁵⁴ BMU - Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2007) *Renewable energy sources in figures – national and international development - June 2007*, p.29. www.bmu.de/english

⁵⁵ Ibid, p.28.

⁵⁶ Productivity Commission, op.cit., p. xxii.

⁵⁷ Australian Government (2008) *Carbon Pollution Reduction Scheme: Green Paper*, July 2008, hereafter: "Green Paper", at pp. 363-370.

⁵⁸ Green Paper, p.370.

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A fourth argument presented by the Commission is that renewable energy laws, particularly at the State level, should be repealed because otherwise we will be left "in the invidious position" of having a "disjointed patchwork of policies", a "distortionary cocktail".⁵⁹ Such arguments have largely motivated the review of the interaction of climate change policies being considered by the Wilkins Strategic Review of Climate Change Programs, with the assistance of the Department of Finance and Deregulation.⁶⁰

It is important to realise that in Europe, many nations are successfully implementing renewable energy feed-in laws at the same time as participating in the EU wide emissions trading scheme. So for Australia to have measures to complement the operation of the ETS is not unprecedented. It may well be the case that in Europe an important component of emissions reductions to date are attributable to the operation of renewable energy and FIT laws rather than due to the ETS.

A core argument of opponents of RE laws is that once a carbon price has been created via an emissions trading system, then it should be left to that carbon market to decide which energy technologies to support, i.e. to decide the lowest cost means for achieving emissions reductions. Thus renewable energy support legislation is said to run counter to that approach. A related argument is that we must avoid muddying the waters of the emissions trading system, to ensure "clear carbon price signals".⁶¹ In the popular press, this narrow approach emphasising economic efficiency was emulated by Alan Wood of *the Australian*, who made the additional argument that "to run such schemes in conjunction with an emissions trading scheme amounts to double, or even triple, taxation of energy consumers...."⁶²

In response, the following points can be made. Firstly, renewable energy laws should at least run until an emissions trading system is fully operational. At this stage there are two years to run until the scheme is even scheduled to commence in 2010. Even with an emissions trading scheme in operation, it may be necessary to retain RE support legislation, because it is unlikely, particularly in the early phases of operation of the carbon market that the price signal will be of sufficient magnitude to offer a sufficiently attractive incentive for early and high levels of RE investment and deployment in Australia.⁶³ The dramatic crash in the price of permits under the

⁵⁹ Productivity Commission, *op.cit.*, p. 27.

⁶⁰ Senator Wong and Minister for Finance and Deregulation, *Media Release*, 27th February 2008

⁶¹ ETS Task Force 2007, p.136.

⁶² Alan Wood, "Renewable energy pledges off target", *The Australian*, November 14, 2007.

⁶³ Climate Institute etc *Making the Switch*, at p.24 states: "Unless carbon prices are high, clean energy sources will not see early deployment in Australia."

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European ETS in 2007, partially due to poor system design and to poor data transparency, bears witness to the teething problems that are all too likely to be encountered.⁶⁴

One of the key reasons for enactment of legislation to create incentives for renewable energy generation is because the national emissions trading system may still not be sufficiently effective by 2025 to send a strong and clear price signal for a switch away from fossil powered generation. This will specially be the case if international linkage of the Australian emissions trading system causes dilution of the carbon price. If Australia relies solely on emissions trading (and particularly an internationally linked emissions trading system) to send a credible price signal and policy message to reduce the carbon intensity of electricity generation, it runs the risk of being unable to meet scientifically based targets for deep cuts of 80-90% of 1990 emission levels by 2050.

Lack of certainty over the future pricing of carbon will reduce the incentive to innovate in terms of zero carbon electricity generation technologies.⁶⁵ If carbon markets lack credibility, and investors have expectations of a low carbon price over the medium to long term, then investments in low carbon technologies will be discouraged.⁶⁶

If domestic lobbying by coal fired generators results in the allocation of substantial quantities of free permits (i.e. grandfathering) and/or other forms of compensation during the establishment of the emissions trading scheme, then there is a strong likelihood that emissions trading will not set a high carbon price. If so, the ETS will only send a very weak signal to investors in renewable energy. Recent media reports provide evidence that industry and supportive politicians in NSW are clamouring to ensure that emissions trading permits are granted free to these generators. The reason apart from protection of the position of the coal fired generators, is to ensure that the value of assets in the NSW power privatisation is not written down.⁶⁷ Mr. John Boshier of the National Generators Forum (representing 21 electricity producers), that otherwise the cost of permits "is going to run into hundreds of millions of dollars, probably over a billion."⁶⁸

⁶⁴ Dr Felix Matthes, Oeko-Institut, Germany, Lecture: "Emissions Trading for Australia: Lessons from Europe", ANU, 17 March 2008.

⁶⁵ Stern Review, p.399.

⁶⁶ Stern Review, p.399.

⁶⁷ Marian Wilkinson, "Power stations want [free] permits to pollute" SMH, March 6, 2008. See further, generally on this topic: Green Paper, Chapter 10.

⁶⁸ Ibid.

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Even without such distortion of the ETS, the Stern review concluded that ETS price signals are unlikely to be sufficient to reduce emissions on the scale and pace required.⁶⁹ It also suggested that the price signal delivered by an emissions trading regime is also unlikely to be sufficient to encourage non-fossil technologies to be widely adopted in the short to medium term. This is due to a number of additional market failures elsewhere – that is, in electricity markets, lock-in to existing technologies, and failures in the innovation market such as the collective action problems associated with the cost-reductions of learning effects.⁷⁰ The Stern Review suggested that there were substantial reasons for, and benefits likely to accrue from supporting RE:

“The uncertainties and risks both of climate change, and the development and deployment of the technologies to address it, are of such scale and urgency that the economics of risk points to policies to support the development and use of a portfolio of low-carbon technology options....The positive externalities of efforts to develop them will be appreciable, and the time periods and uncertainties are such that there can be major difficulties in financing through capital markets.”⁷¹

RE laws will remain necessary because governments are unlikely to have the political will to remove fossil fuel subsidies. It is politically difficult to internalise the economic cost of damage caused by carbon dioxide/greenhouse gas emissions because the effects are both global and long-term. This experience has been established in countries that have sought to internalise the external costs of emissions of radioactive materials from nuclear power plants.⁷²

The need for RE support legislation has been underlined by increased competition in Australian markets for electricity, where as a side effect of that competition, there is evidence that some power producers and retailers are being squeezed and are tending to turn to the cheapest supplies of electricity (i.e. typically coal fired generation), regardless of the environmental impacts.⁷³

It is likely that the ETS on its own will not deliver the emissions reductions on the scale and pace required to ensure that Australia plays its part in preventing dangerous climate change. The Stern Review noted that, “The urgency of the problem means that technology development may not be able to wait for robust global carbon pricing. Without appropriate incentives private firms and capital markets are less likely to invest in developing low-emission technologies.”⁷⁴ In other words, if making deep and drastic cuts to carbon emissions requires “double” taxation of

⁶⁹ Stern Review, Chapter 16.

⁷⁰ Stern Review, p.397

⁷¹ Stern Review, p.347.

⁷² Käberger T. (2002) “Swedish Nuclear Power And Economic Rationalities” 13(2) *Energy & Environment* 191-206.

⁷³ Fredric C. Menz, Stephan Vachon (2006) “The effectiveness of different policy regimes for promoting wind power: Experiences from the states”, 34 *Energy Policy* 1786–1796 at 1794.

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energy consumers, then so be it, especially if adding two measures is necessary when neither of them alone would be of sufficient magnitude to induce any significant fuel switching response from the electricity market. Some of the revenue from emissions trading (e.g. fees levied on over-emitters) could be used to finance the support of low emissions technologies.

The approach of operating ETS and RE laws in tandem is accepted as sensible by the Federal Department of Climate Change which has stated that the expanded MRET is only to be “phased out between 2020 and 2030 as emissions trading matures and prices become sufficient to ensure that an MRET is no longer required to drive deployment of renewable generation technologies.”⁷⁵

Renewable energy deployment laws are best seen as a complement to, rather than a substitute for, an emission trading scheme.⁷⁶ This is because there are market failures with the process of technological change itself,⁷⁷ and because RE laws seek to address a number of objectives other than least-cost abatement. One of these is diversity of low emission energy supplies. There is a need to create a portfolio of energy generation capabilities that will be available over the long term.⁷⁸

If any Federal legislation is to make a serious contribution to reducing GHG emissions from the electricity sector, the question of coal fired generation must be addressed. An ETS alone will be insufficient. It is notable that in legislation for an emissions trading system in New Zealand contains provisions for a moratorium on the construction of coal fired/ thermal generation. Part 2 of the *Climate Change (Emissions Trading and Renewable Preference) Bill 2007* proposes the amendment of the Electricity Act 1992 to create a preference for renewable electricity generation via moratorium on new fossil-fuelled thermal electricity generation, except to the extent necessary to ensure the security of NZ’s electricity supply.

⁷⁴ Stern Review, p.400.

⁷⁵ Department of Climate Change website <http://www.greenhouse.gov.au/renewabletarget/index.html> , accessed 12.3.08.

⁷⁶ McLennan Magasanik Associates (MMA), (2007), *Increasing Australia’s Low Emission Electricity Generation – An Analysis of Emissions Trading and a Complementary Measure: Report to Renewable Generators of Australia*, (Internet publication), 73pp, at p.4.

⁷⁷ Ibid, p.4.

⁷⁸ Stern Review, p.111.

V. EXISTING FIT LAWS AND PROPOSALS – AUSTRALIA

The Australian experience with FIT Feed in laws has begun but is still relatively limited to date. Feed-in laws have been enacted in South Australia⁷⁹, Queensland, the ACT. By international standards, the Queensland and SA Act are a limited form of FIT law because of their emphasis on small scale PV generation by householders and because of their net export payment method. Limited feed-in provisions, if not a feed-in law, have also been enacted in Victoria.⁸⁰ A previous private members Bill containing feed in provisions was introduced to the Commonwealth Parliament in 2006 but was not enacted.⁸¹ In Queensland, feed-in provisions were enacted in 2008 applying to small grid-connected photovoltaic installations.⁸² (*The detail of existing State and Territory feed-in legislation is set out in Appendix One.*)

The new Federal government, along with the States, agreed at a Council of Australian Governments (COAG) meeting in December 2007, to work cooperatively to harmonise and merge existing State and Federal renewable energy targets into a single national expanded target Renewable Energy Target or MRET scheme by 2009.⁸³ This process is being pursued through COAG which is due to report by September 2008 with final MRET design and proposals for a streamlined set of complementary policies across jurisdictions.⁸⁴ As explained above, this will involve a legislated target of 45,000 GWH of renewable electricity in 2020, so that 20 per cent of Australia's electricity supply will be sourced from renewables by 2020.

In the context of this proliferation of state legislation, the new Federal government has set out a stated policy objective of the harmonisation of State feed-in tariffs. This forms part of a broader objective of the harmonisation of all renewable energy laws. To that end, the Council of Australian Government's COAG Working Group on Climate Change and Water, comprised of officials from all Australian Governments, chaired by Senator Wong, federal Minister for Climate Change is preparing an options paper for COAG on a nationally consistent approach to feed-in tariffs.

⁷⁹ *Electricity (Feed-in Scheme – Residential Solar Systems) Amendment Act 2008 (SA)*, passed the Legislative Assembly on 14.2.08.

⁸⁰ ALP (2006) *Tackling climate change : helping families play their part*, West Melbourne, Vic., 14pp. Policy Statement for the 2006 Victorian election.

⁸¹ Climate Action Bill 2006 (PMB, Sen. Milne), Second Reading Speech, 22.3.07.

⁸² Government of Queensland (2007) *Climate Smart 2050: Queensland Climate Change Strategy*, p.viii.

⁸³ Dept of Climate Change website, Renewable Energy page, viewed 22.2.08.

⁸⁴ <http://www.greenhouse.gov.au/markets/mret/index.html>

⁸⁴ COAG Communique,, 20th December 2007. <http://www.alp.org.au/media/1207/mspm200.php>

In considering the implementation of the proposal for a nationally uniform FIT scheme, there are a number of options. In terms of the mechanism, they can be summarised as:

- a) Override state legislation with a Federal FIT law which is expressed to cover the field (s.109 inconsistency).
- b) Cajole all states to agree to a uniform FIT law (mirror legislation).

In terms of the substance, the options include either:

- a) 'Dumb down' all FIT regimes (eg ACT) to the level of the SA Act; or
- b) Improve all FIT regimes to emulate the ACT law; or
- c) To reach an agreement for repeal of all FIT laws in all jurisdictions and then rely solely on MRET legislation (the REE Act).

Introduction of a federal FIT law raises the question of whether the Commonwealth would intend to cover the field to the exclusion of existing State and Territory feed-in laws. This Bill appears not to express such an intention. This leaves it open to the critique that it will not achieve the objective of national uniformity by allowing a diversity of state based regimes to persist.

It is alleged by some critics that a piecemeal approach to renewables is going to be too slow to meet aggressive targets. A proliferation of different incentive schemes may be to some extent undesirable, but it cannot be accurately described as fatal to investment. For a long time in Australia, State level action was required due to the reluctance of the Federal government to Act.

However statements made in the ALP's pre-election policy document on renewables regarding the need to abolish 'red tape' in terms of a proliferation of FIT laws are misplaced, as incentive schemes, as opposed to regulatory requirements, do not create barriers to investment. This is particularly the case for small scale investors in renewable generation who are unlikely to be setting up projects in several jurisdictions simultaneously.

This suggests that it is feasible for both Commonwealth and State incentive schemes to co-exist. This has been the case for the MRET and the Victorian RET scheme. In Canada, national FIT tariffs were adopted in 2007, in addition to FIT laws in Ontario.⁸⁵

⁸⁵ REN 21 (2007) *Renewables 2007: Global Status Report*, "At the national level, Canada adopted the equivalent of a feed-in tariff premium, which will provide CAD 1 cent/kWh to almost all types of renewables power projects constructed through 2011 and which is expected to cover an additional 4 GW of capacity."

VI. DESIGN DETAILS OF PROPOSED FEED-IN LAW

Cohabitation of MRET and FIT provisions

There are organisational and conceptual issues raised by the intent of the Bill to co-locate two different forms of economic instrument, namely feed-in tariff and tradeable certificates, in the same legislation. At a minimum it will be necessary for the terminology and mechanisms involved in the FIT section of the REE Act to be consistent with the existing provisions.

The international evidence presented above suggests that the ideal outcome would be to replace the existing REE Act based on tradeable certificates, with a national feed-in tariff. However, it is highly unlikely in the present political context that the MRET/certificate model is to be completely abandoned in favour of a feed-in law. On that basis, it is most logical to proceed towards a limited hybrid or cohabitation model.

A review of the international context suggests it is viable for Australia to envisage the operation of hybrid legislation incorporating FIT provisions alongside the existing MRET mechanism. This will be most successful if designed so that the MRET provisions apply for the end of the renewable energy and technology market closest to price-competitiveness and FIT provisions are applicable to the further-from market technologies.

This is already the case in Italy where FIT laws coexist with Renewable Portfolio Standard legislation. The FIT law only applies to solar PV, and such plants are exempt from the provisions of the RPS scheme.⁸⁶ There is further evidence – from the United States - that it is possible to introduce fixed price elements into RPS laws. Sawin gives provides an analysis of 'hybrid' instruments in the US. There are fixed price offers in place in five US states which already have RPS laws, in Wisconsin, Vermont, New Mexico, Minnesota, and Washington State.⁸⁷ This suggests that the hybrid approach – where fixed price incentives operate in tandem with, or within, RPS regimes, is viable.

Rather than seeing them as mutually exclusive, it is wiser to see feed-in tariff provisions and tradeable certificate laws as potentially complementary. If feed-in tariffs provide an additional tool that assists in the achievement of national renewable energy targets in the quickest

⁸⁶ Glorioso, C.; Lionetti, M. and Presicce, F. of Italian Ministry for the Environment Land and Sea (2007) *Mediterranean and National Strategies for Sustainable Development Priority Field of Action 2: Energy and Climate Change Energy Efficiency and Renewable Energy: Italy - National study*, published Plan Bleu Regional Activity Centre, Sophia Antipolis, March 2007, at pp.18-19.

⁸⁷ Rickerson, Wilson H., Sawin, Janet L., Grace, Robert C (2007) "If the Shoe FITs: Using Feed-in Tariffs to Meet U.S. Renewable Electricity Targets" 20(4) *The Electricity Journal* 73-86.

possible time, then surely this is of benefit.⁸⁸ The key point is that in the hybrid/co-habitation scenario, feed-in tariffs are aimed at renewable energy technologies and models of ownership that would not be 'incentivised' by the operation of the tradeable certificate (REC) market. As Sawin has pointed out in the US context, fixed price incentives can be deliberately limited in their scope. In other words they are only aimed at policy goals "that generally would not be competitive in the high-risk, price-competitive environment of RPS, such as emerging technologies (e.g., PV and biogas), residential and community ownership, and in-state manufacturing."⁸⁹ Rickerson et al suggest that in this application FIT laws can be targeted at only small renewable generators (e.g. under 20 MW) that might not otherwise successfully compete in RPS markets.⁹⁰

As the European Photovoltaic Industry Association has pointed out in relation to tradeable certificate laws,

"Operators need to be active on 2 different markets. The electricity is sold on the electricity market and the certificates are traded on a separate market. Due to the complexity and transaction costs of the support scheme, centralized production of electricity is favored and therefore [certificate laws] prevents the emergence of small scale decentralized electricity production."

It must be noted that under the existing federal *REE Act*, small generation units are entitled to claim deemed numbers of renewable energy certificates to simplify their applications. They can also assign their right to create certificates to an agent who may act on their behalf thus reducing transaction costs. Small generators are not required to become accredited as power stations, and instead are eligible for registration as deemed small generation units. Small generators are typically micro hydro, wind or photovoltaic (PV) generators who produce under twenty five certificates and are under 10kW capacity. Recent amendments mean that PV generators under 100kW in capacity and who produce under two hundred and fifty certificates per year are now eligible to be registered as SGUs.⁹¹ However, none of this changes the fact that small generation units in wind, solar, and hydro represented less than 1% of the total REC production to 2007.

The EPIA suggested a solution for MRET/certificate models:

"In order not to exclude emerging technologies from TGC, technology specific quotas (or even application specific quotas – large scale versus roof top PV systems) would

⁸⁸ Rickerson, W., Grace, R. C. (2007) "The Debate over Fixed Price Incentives for Renewable Electricity in Europe and the United States: Fallout and Future Directions", Washington, p.14.

⁸⁹ Rickerson, Sawin, Grace, (2007), op.cit. (If the Shoe FITs).

⁹⁰ Rickerson & Grace (2007), *Fallout and Future Directions*, p.15.

⁹¹ Rossiter & Singh (2006) *Australia's Renewable Energy Certificate System*, May 2006, ORER.

need to be set. However, this would increase even more its complexity and liquidity would be low.”⁹²

By limiting the scope of application of a Feed-in law when applied in the context of an existing tradeable certificate law, concerns about the overall cost of having two concurrent policy measures in operation are addressed.⁹³

The Garnaut Review endorsed the introduction of feed-in tariffs, stating: “There is a case for special feed-in tariffs for household electricity generation and co-generation. The case can be quantified by reference to timing and transmission considerations.”⁹⁴ The economic benefits associated with encouraging embedded and distributed generation such as solar PV are discussed further below at *Gross v Net Metering*.

In closing this section, it is worthwhile observing that RPS policies in the United States show signs of converging with some of the design characteristics often associated with feed-in tariffs. Rickerson, Bennhold, and Bradbury have noted that there has been a trend towards technology differentiation, and towards long-term contracts or other mechanisms to protect investors from tradeable renewable energy certificate (REC) market volatility.⁹⁵ With an increasing recognition of the importance of technology differentiation and benefits from RE portfolio diversification combined with recognition of the rewards available from addressing investor security concerns inherent in REC markets, it should become more acceptable to incorporate some of the elements of feed-in legislation into tradeable certificate laws.⁹⁶

Breadth of coverage of FIT law

For an FIT law to encourage the maximum RE investment, an offer of meaningful incentives to as broad as possible a range of RE industry sectors should be made. This principle should be subject to the following limits:

- (1) FIT not available for large scale hydro generation, and
- (2) a ‘double dipping’ exemption – to prevent FIT projects from simultaneously accessing MRET certificate incentives.

⁹² European Photovoltaic Industry Association (2007) *Supporting Solar Photovoltaic Electricity: An Argument for Feed-in Tariffs*, p.11.

⁹³ Rickerson & Grace, *Fallout and Future Directions*, p.15.

⁹⁴ Garnaut Review, Chapter 17 at p.427.

⁹⁵ Wilson Rickerson, Florian Bennhold, and James Bradbury “Feed-in Tariffs and Renewable Energy in the USA – a Policy Update”, By May 2008, <http://www.boell.org/docs> (citing Wisser and Barbose, 2008).

⁹⁶ Rickerson and Grace, *Fallout and Future Directions*, p.15.

The Milne Bill for a Feed-in Tariff appears to encourage a broad spectrum of RE technologies – as it adopts the definition of renewables in the existing Act for MRET (the REE Act). The Bill approaches the definition of ‘qualifying generator’, s.5 by stating that all RE generation sources listed in the existing REE Act (s.17) are defined as an eligible renewable energy source if they generate electricity from a source listed in section 17 as an eligible renewable energy source.

On that basis it is consistent with international best practice. However it is too early to determine whether the Bill would provide adequate incentives for each particular industry sector as the Bill does not propose particular tariff rates.

International comparisons reveal that most FIT laws have an extremely broad coverage.

Table 2: Application of Feed-in Offer across renewable energy sectors

Sectors that can access FIT payments	Germany	Spain	South Australia	Milne Bill
Biogas	Yes	Yes	No	Yes
Photovoltaic	Yes	Yes	Yes	Yes
Solar Thermal	No	Yes	No	Yes
Structurally integrated photovoltaic systems	Yes	No (only differentiation by plant size)	No additional tariff offered, same as for rooftop PV.	No additional tariff offered
Wind (onshore)	Yes	Yes	No	Yes
Offshore wind	Yes	Yes	No	No additional tariff offered
Geothermal	Yes	Yes	No	Yes
Sea energy (wave and tidal energy)	No	Yes	No	Yes

Source: ⁹⁷

⁹⁷ http://www.erneuerbare-energien.de/files/english/renewable_energy/downloads/application/pdf/kurzgutachten_einspeisesysteme_en.pdf

Duration of guarantee

This is a crucial aspect of the Bill. Its offer of a guarantee of premium tariff for 20 years is in line with international best practice. The Table below shows the length of guarantee offered in selected jurisdictions.

Table 3: Duration of tariff guarantee by technology, by jurisdiction

Jurisdiction	<i>Wind power (onshore)</i>	<i>Solar PV</i>	<i>Geothermal</i>
ACT	20 yrs	20 yrs	20 yrs if gazetted
SA	NA	20yrs	NA
Queensland	NA	20 yrs; but Act expires 2028	NA
Victoria	None offered	None offered	None offered
Germany	20 yrs	20 yrs	20yrs
France	15 years	20 yrs	15 yrs
Spain	No limit	No limit	No limit
Austria	13 yrs	13 yrs	13 years
Ireland	15 years	NA	NA

Source: Australian legislation; Overseas data derived from Arne Klein, Anne Held, Mario Ragwitz, Gustav Resch, Thomas Faber (2006), Evaluation of different feed-in tariff design options - Best practice paper for the International Feed-in Cooperation, A research project funded by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Fraunhofer Institute, Germany p.14.

The importance of metering methods

Some FIT laws (eg. SA, Queensland) offer an incentive on the basis of net exports to the grid only. Others offer a more generous incentive on the basis of gross production of electricity on-site. Whilst this may seem a question of arcane details, it is actually very important to the question of the economic viability of investment in renewable energy generation equipment. The following discussion explains the importance of metering methods.

The SA law only offers its incentive on a “net export” basis, that is, on the net quantity of electricity exported to the grid after accounting for in-home consumption.⁹⁸ In other words, Net Export = Gross Production – Household Load. The liability for domestic consumption is reduced by the output of the PV system.

Under a gross metering system (as in the ACT and Germany), PV owners receive the premium tariff for all electricity produced by their systems (whether consumed at home or exported). They pay full retail price for all of their household consumption. Gross production metering offers higher returns than under the ‘net export’ system (This is explained further below).

The approach of the Milne Bill in applying the gross metering method represents international best practice. Both the international experience and the raw economic calculations suggest that it is essential that any Bill for a feed-in tariff take the gross metering approach, if it is to be effective in offering a substantial – as opposed to slight– incentive for RE generation.

Under the net export system, both import and export meters are read quarterly, and data is sent to the retailer. Given that the output of an average sized residential PV system is typically smaller than the total electricity consumption, there are only limited periods over which there is a net export of electricity taking place. As was explained by the SA Discussion Paper on FIT in that state: “Net exports typically vary from 10 to 50% of the total production of the panels for the billing period depending mainly on household consumption patterns and size of the PV system. If 50 per cent of panel gross production is returned to the grid this is equivalent to around 20 per cent of the average household’s electricity consumption.”

However, high consumers of electricity would export only around 10% of the household’s average electricity consumption and thus would make little return on their investment. The net metering approach tends to only offer an incentive to frugal users of electricity, who are more likely to make a good return. Under a German style gross payment system, all consumers obtain the same rate of return regardless of their on-site electricity consumption.

In relation to the SA net export model of FIT law, the Business Council for Sustainable Energy (BCSE) commented that “such a modest incentive will barely register in a prospective customer’s consideration of the economics of purchasing a solar PV system.” They stated that

⁹⁸ This is evident from the drafting of s.36AD(3) contained within Division 3AB of the *Electricity Act 1996* (SA). It is also clear from the SA Discussion Paper.

the scheme is “highly unlikely to drive any significant additional market growth for solar PV”.⁹⁹ Paul Gipe, an international wind energy expert based in California went as far as saying “this is not a feed-in tariff or feed law. It only pays for excess generation.” He described the SA law as a “faux feed-in tariff”. This is a token program. It masquerades as a policy while not doing what it says is its intent.”¹⁰⁰

Returning to the argument that net export model is superior in that it sends a strong message to PV owning households to reduce their electricity consumption in order to maximise returns from their PV investment. The Garnaut Review described such reasoning as “erroneous” on the basis that incentives to reduce consumption should apply to all consumers of electricity through the retail price paid for electricity, and should not selectively apply only to participants in the feed-in tariff system. Garnaut also pointed out that “the benefits of embedded generation (lower transmission losses, deferred costs for network augmentation, and displacement of high-cost generation during peak periods) are present for every unit of electricity produced, not just the amount exported.” On that basis gross metering is a better and more accurate method for measuring and pricing those benefits than a net export calculation.

Premium on sales into spot market

One aspect of international best practice not offered to RE generators by Australian FIT laws and proposals (including the Milne Bill) is the option of a premium upon sales into the spot market, as an alternative form of incentive.

Three jurisdictions (Spain, the Czech Republic, Slovenia) offer the option of sales of renewable electricity directly into the spot market. On top of the market price – which may be very high during periods of peak demand - generators receive a premium per kWh of electricity sold. Premium tariffs are offered as an alternative to fixed tariffs, and producers are free to choose the most attractive incentive given their circumstances.¹⁰¹

For example, Spanish feed-in legislation (Real Decreto 661/2007)¹⁰² varies from German law because in addition to offering the option of a fixed payment (‘tarifa regulada’), it also offers RE producers the alternative of selling into the electricity spot market and to receive a premium

⁹⁹ Business Council for Sustainable Energy (BCSE) (2006), *Submission to SA Dept of Premier and Cabinet on South Australia’s Feed-in Mechanism for Residential Small-scale Solar Photovoltaic Installations*, 27 March 2006, internet publication, www.bcse.org.au/docs/Publications_Reports/BCSE%20SA%20Feed-in%20Submission%20final.pdf

¹⁰⁰ Paul Gipe, email to author, 13.3.08.

¹⁰¹ Klein et al, (2006) p.22. (above n 4).

¹⁰² Real Decreto 661/2007, which superseded Real Decreto 436/2004. These laws are supplemented by the 2005-2010 Renewable Energies Plan (*Plan de Energías Renovables 2005-2010*).

(‘prima’) in Eurocents per kWh on top of the price that has been negotiated in the market. Having selected one tariff option over another, a producer is free to switch to the alternative after one year has elapsed.¹⁰³

It can be argued that the premium option is more compatible with liberalised electricity markets than fixed feed-in tariffs. On the other hand, it is potentially more risky for RE producers because returns are not guaranteed or pre-determined, and there is no associated purchase obligation.¹⁰⁴ Nevertheless, the evidence is that the majority of generators have selected the latter option, of the premium (‘prima’) because the price of electricity (particularly in peak demand periods) has made it a more profitable choice than the fixed/regulated tariff.¹⁰⁵

Capacity Based Limitation on Tariffs

The Milne Bill offers the maximum possible incentive to RE by not imposing any capacity based limitation on tariffs payable. If the Bill were to be amended to contain a cap on the generation, this would be a retrograde step. It would have the direct effect of dissuading investors from proceeding with large scale RE plant projects.

The ACT legislation (s.8) discounts the premium payable to larger sized renewable energy generators, as follows. If the total capacity of the generators is more than 10kWh, and not more than 30kWh— the rate payable is only 80% of the premium rate. If the total capacity of the generators is more than 30kWh, the rate payable is only 75% of the premium rate.

The aim appears to be prevent the capture of windfall profits by larger generators given the economies of scale available to large scale installations. This approach is consistent with international practice in Austria, Germany, Italy, Luxemburg, Portugal, Slovenia and Spain where different tariff levels are applied according to the plant capacity, with larger capacity plants (in MW) being paid a lower tariff.¹⁰⁶

Whilst it is one thing to make a reduction in tariff offered on the basis of capacity, it is another to completely remove the tariff for larger installations, as is the case in Queensland and South

¹⁰³ Ragwitz & Huber (2005) at pp.8-9.

¹⁰⁴ Ragwitz & Huber (2005), p.49

¹⁰⁵ Rickerson & Sawin, (If the Shoe Fits) op.cit., at 75. The detail of sale to the spot market is discussed in Ragwitz & Huber at 25-26.

¹⁰⁶ Klein et al, p.19.

Australia. For example in SA, the feed-in provisions only apply to a "small photovoltaic generator", that is "small photovoltaic generator" means a photovoltaic system with capacity up to 10kVA for a single phase connection and up to 30kVA for a three phase connection.¹⁰⁷

Another form of capacity dependent adjustment of tariffs is based on the attainment of national RE goals. In Portugal a system is applied where feed-in tariffs are revised when a certain capacity of power plants is reached nationwide (PV: 150 MW, Biomass: 150 MW, Biogas: 50 MW). The tariffs for existing plants are adjusted to inflation.¹⁰⁸ In Spain, the law provides that tariffs for solar are to be revised when the total capacity installed of solar PV reaches 150 MW or for solar thermal reaches 200 MW.¹⁰⁹

Model for apportioning costs

The Bill differs from other feed-in legislation in that applies a government administered reimbursement & funding model instead of a market administered cost-sharing arrangement where the additional cost is distributed onto the electricity accounts of all end-users. Thus this Bill envisages a greater degree of government involvement in feed-in arrangements than has been required elsewhere. The model proposed, involving passage of legislation for a levy, suggests potentially more administrative complication for government. In Europe the administration of FIT laws is largely left to market participants. The costs of feed-in payments to renewable generators are distributed equally among all electricity consumers by passing them through. In other words, they are eventually included in the electricity price paid by the final retail electricity customer. For example, German feed-in legislation does not involve the government in calculating and distributing feed-in revenues. Grid operators and electricity generators are entitled to pass on the difference in costs for electricity from renewable energies to the final consumer.¹¹⁰

As Lauber and Mez explain:

A key regulatory element of the [EEG German feed-in] Act was the distribution of costs from RES-E compensation across all power grid operators on a pro rata basis, calculated on their ratio of RES-E in nationwide electricity sales. Also, the utilities were now entitled to benefit from the special feedin rates for their own RES-E generation facilities. This had not been the case earlier and was expected to become important for very large-scale investments, such as offshore wind farms.¹¹¹

¹⁰⁷ *Electricity Act 1996 (SA)*, s.36AC.

¹⁰⁸ Klein et.al, p.20.

¹⁰⁹ Klein et.al, p.21.

¹¹⁰ Lauber, V., Mez, L. (2006) "Renewable Electricity Policy in Germany, 1974 to 2005", 26 *Bulletin of Science Technology Society*, April 105-120.

¹¹¹ *Ibid* at 110.

If the levy model is to be adopted we can consider the option of creating a fund. According to the WFC “The fund's income can come, for example, from taxing conventional energies or by a share that all electricity consumers have to pay as a proportion of their electricity bill” Examples are the Green Energy Fund enacted in Maharashtra, India, in 2004; and the Energy Fund announced in Sri Lanka in 2007.

Determination of Premium Rate

Feed in Tariffs must be reviewed regularly so that tariffs are set at an appropriate level to achieve renewable energy policy goals. One reason is because the cost of installing new renewable energy generation may undergo significant changes over time, for example due to increases in the cost of inputs or due to price decreases resulting from technological breakthroughs.

Inflation adjustment is another issue. Consideration should be given to including a clause so that the real value of the tariff over time is not eroded by increases in the Consumer Price Index. Balanced against this is the need to prevent unnecessary profit taking due to decreases in costs over time. Those considerations are discussed below under ‘Tariff Degression’.

In relation to adjustment of the tariff level, it is necessary to decide whether this is applied only to new installations or whether adjustments should also apply to existing installations.¹¹² If it applies to existing installations, such a provision could have a negative impact on investment certainty, going against the policy intent of the legislation.

Another question is who is tasked with determining the appropriate rate. At present the Bill leaves the task of determining the rate to the Minister. An alternative option is to have the rate of the FIT set independently by an Expert Body rather than the Minister. At a minimum, to ensure that an FIT law continues to be effective despite a potentially unsympathetic future Minister, it would be wise to include additional statutory guidance for the Minister . The ACT law provides a fairly good model, as follows: (s.9(3))

“In making a determination, the Minister—

- (a) must give priority to the following:

¹¹² Klein et.al., p.10.

- (i) the desirability of costs under this Act impacting equitably on all electricity users;
 - (ii) the need to encourage the generation of electricity from renewable sources;
 - (iii) the need to reduce emissions from greenhouse gases;
 - (iv) the need to reduce the likely effects of climate change;
 - (v) the desirability of occupiers being able to recoup investment on renewable energy generators within a reasonable time; and
- (b) must have regard to the following:
- (i) the amounts payable under this Act by an electricity distributor;
 - (ii) the amounts payable under this Act by an electricity supplier;
 - (iii) any additional metering costs passed on to an occupier because of section 6 (2) (c);
 - (iv) anything else the Minister considers relevant.

The Fraunhofer Institute's Best Practice Evaluation of different Feed-in designs in Europe (2006) suggests the option of including avoided external (ie environmental) costs in the determination of the tariff level. These can include avoided costs involving climate change, health damage from air pollutants, effects on energy supply security. The broad category of costs includes any expenses that would occur, if RE plants did not exist and the electricity had to be generated in conventional thermal power plants. This model is applied in Portugal. In other words, under the Portuguese FIT law, renewable tariff levels are based on a calculation of avoided costs.

Tariff degression

In order to ensure that the goal of continual reductions in the price of renewable energy are achieved, some jurisdictions apply a system of tariff degression. Under which the later an installation commences operation, the lower the tariff payable. Specifically, the term refers to legislative provisions which reduce annually the amount of premium tariff payable by a specified percentage. For example in Germany in relation to Geothermal plants, the tariff payable is reduced annually by 1%.¹¹³ Tariff degression encourages early investment and speedy completion of projects. The measure is also designed to take account to technological innovation and learning by doing benefits, and to discourage investors from delaying the commencement of projects in the hope of reduced future costs.

Tariff degression provides additional incentives for technology improvements and cost reductions. It serves to reduce risks of rent seeking and over-payment of feed-in premiums to

¹¹³ The Act states: "(2) As of 1 January 2010, the minimum fees specified ... for new plants commissioned after that date shall be reduced by one per cent annually of the relevant value for new plants commissioned in the previous year."

those installations in later years which are more financially viable due to ongoing cost reductions. Ideally, rates of degression applied are derived from empirical observation of cost reductions for the each band of renewable energy technology. Provisions for tariff degression are a vital element of FIT laws in other jurisdictions (i.e. France, Germany, Italy) which have not been included in the Milne Bill (*See*: Table 4). Nor is it included in existing FIT laws in SA, ACT or Queensland. It is possible that an informal approach of tariff degression could be applied by the Minister administering the Act. This would be done in the course of making regular, scheduled, annual revisions to the tariff payable, as is the case in Spain. However such an approach can cause investment uncertainty, which itself runs against the intent of the legislation.

Table 4 : Feed-in tariff designs in the EU Member States¹¹⁴**Table 3.1: Feed-in tariff designs in the EU Member States**

Country	Purchase obligation	Stepped tariff	Tariff degression	Premium option	Equal Burden Sharing?	Forecast obligation
Austria	x	x	-	-	x ¹⁾	-
Cyprus	x	x	-	-	x	-
Czech Rep.	x (for fixed tariff)	x	-	x	x	-
Denmark	x (except for wind onshore)	x	-	x (wind)	x ¹⁾	-
Estonia	x (for grid losses)	-	-	x (new draft)	x	x (new draft)
France	x	x	x (wind)	-	x	-
Germany	x	x	x	-	x ¹⁾	-
Greece	x	x	-	-	x	-
Hungary	x	-	-	-	x	-
Ireland	x	x	-	-	x	-
Italy	x	x	x (PV)	-	x	-
Lithuania	x	-	-	-	x	-
Luxembourg	x	x	-	-	x	-
Netherlands ³⁾	-	x	-	x	2)	-
Portugal	x	x	-	-	x	-
Slovakia	x (for grid losses)	x	-	-	x	-
Slovenia	x (for fixed tariff)	x	-	x	x	x
Spain	x (for fixed tariff)	x	-	x	x	x

Purchase obligation

The Milne Bill is consistent with international best practice in feed-in legislation as it includes a purchase obligation clause. As Held et al have pointed out "Without a guaranteed purchase the investors request a higher return on investment to cover the increased risk."¹¹⁵ The German legislation goes further and obliges distribution network owners to both connect and then to purchase RE as "a priority".¹¹⁶

Network connection and transmission issues

The offer of a feed-in tariff at an attractive rate is a necessary but not sufficient condition to

¹¹⁴ Klein et.al., p.10.

¹¹⁵ Held & Ragwitz, op.cit., p.23.

guarantee a large increase in investment in new renewable energy generation capacity. Even if the law provides adequate financial incentives it will not induce additional investment unless other barriers to investment – such as transmission issues and grid upgrades are addressed.

RE investors typically seek answers to transmission questions prior to committing funds to a project. Otherwise ideal generation sites may be remote from load centres & major transmission lines.¹¹⁷ There is no point investing in generating capacity if transmission capacity is not sufficient to deliver large amounts of new electricity to the grid and from there to the nearest major load centre. The lead time for installation of new generation capacity may not be matched by the timeframe for transmission upgrades.

Part of the solution lies in legislative provisions that clearly allocate responsibility for grid upgrades, and which set out an obligation to connect RE generators. The Japanese experience in which the feeding of wind energy into the grid has been blocked by distribution companies setting quotas suggests that these provisions are very important to prevent strategic behaviour by market incumbents to block the entry of smaller renewable energy producers.¹¹⁸

The German feed-in law addresses connection, upgrade and transmission issues very effectively. The EEG Act provides as follows in terms of grid connection:

Obligation to Purchase and Pay Compensation

(1) Grid operators shall be obliged to connect to their grids electricity generation installations as defined in Section 2 above, to purchase electricity available from these installations as a priority, and to compensate the suppliers of this electricity in accordance with the provisions in Sections 4 to 8 below.

A grid shall be considered to be technically suitable even if – ... – a grid operator needs to upgrade its grid at reasonable economic expense to feed-in the electricity; in this case, the grid operator shall be obliged to upgrade its grid without delay if this is requested by a party interested in feeding in electricity.

s.3(1), Renewable Energy Sources Act, Germany, 2000

This key aspect of German feed in laws - the question of grid upgrades and the incidence of the burden of payment for such upgrades - has been omitted from both the SA Feed in law and the ACT feed-in Bill. There is some evidence that in Spain, due to the lack of a “preferential connection” clause similar to that in German law, it has been the case that some utilities have

¹¹⁶ EEG, Article 2, 4(1).

¹¹⁷ NZ Ministry of Economic Development (2007) *New Zealand Energy Strategy to 2050 – Powering Our Future*, MED, Wellington, p.81, at http://www.med.govt.nz/templates/MultipageDocumentPage_32080.aspx#B4

¹¹⁸ Yasushi Maruyama, Makoto Nishikido, Tetsunari Iida, (2007) “The rise of community wind power in Japan: Enhanced acceptance through social innovation” 35 *Energy Policy* 2761–2769.

delayed processing of applications by up to 8 to 9 months. Such high administrative burdens have led to reductions in the rate of investment in the smaller end of the PV market.¹¹⁹

In Victoria, problems persist in terms of small scale PV generation.¹²⁰ Connection and transmission issues were at least partially addressed by legislative amendments in 2004 in Victoria in relation to wind energy and grid connection and upgrade obligations via Division 2A, *Electricity Industry Act 2000*, headed "Pricing for the facilitation of the development of wind energy generation facilities". Section 15C(1)(a) enables the Governor in Council to make an Order setting out principles for charging for grid upgrades and connections. However this section effectively sets out the opposite of the German approach, by stating that an order shall:

"specify the principles to be applied by an operator of a relevant distribution system in determining connection charges for connection to, and use of, the relevant distribution system by a relevant generator in relation to electricity supplied from a wind energy generation facility operated by that generator so as to enable that operator [ie the distribution network operator] to recover the capital costs that operator has incurred or may incur in respect of a relevant augmentation".¹²¹

At this stage Australian electricity legislation leaves something to be desired in relation to clarification of transmission issues in favour of renewable energy generation. This is a key aspect of German feed in laws that has been omitted from the proposed Bill - the question of grid upgrades and the incidence of the burden of payment for such upgrades.¹²²

Social equity aspects

Some have emphasised the social equity implications of Feed in Laws. This issue gained much prominence in the ACT, with statements by the Chief Minister that he was not in favour of any legislation which would see transfers of wealth from ordinary folks to "millionaires" in the leafy Canberra suburbs of Red Hill, Forrest and Yarralumla. The CM would did not endorse FIT proposals directly leaving the introduction of legislation to a more innovative backbencher, Mr Gentleman MLA. The FIT legislation was subsequently enacted in the ACT in any case.

Whilst social equity is an important consideration, this issue was hijacked by those who remained sceptical about the benefits of feed-in laws, and who were searching for excuses to

¹¹⁹ Interview, B. Hannig. Legal Counsel, Conergy, 7.2.08.

¹²⁰ Alternative Technology Association & Marsden Jacob Associates (2005) *Impediments to Grid Connection of Solar Photovoltaic: the consumer experience. Research into the challenges facing Victorians negotiating grid connection*, 16 May 2005, Authors: Kane Thornton & Dr Jeff Washusen, 84pp.

http://www.ata.org.au/wp-content/projects/impediments_to_grid_connection.pdf

¹²¹ See also: <http://www.esc.vic.gov.au/public/>. Guideline 15 – Connection of Embedded Generation

dump prior policy commitments that had been made to have them enacted. This was evident from the equivocal stance regarding the reason for delays in considering the draft legislation presented in a radio interview given by the Chief Minister in April 2008 and was confirmed in interviews with the author by two highly placed anonymous departmental informants.¹²³ A discussion paper by the Chief Minister's Department overstated the average PV system size, and presented options which artificially restricted the billing pool to residential customers only, and overestimated the extent of response to the measure to an optimistic 10% of households, giving an annual household impact of a \$218 increase in electricity bills.¹²⁴ This had the effect of exaggerating the likely level of FIT payments to be included in future electricity accounts.

However, the more realistic scenarios in the ACT paper suggested an increase of \$18 was more likely, for a 2% uptake with 2600 new systems.¹²⁵ Even when we compare with Germany where the extent of uptake of FIT incentives is very far reaching we see that the impact on individual households is relatively minor. The average cost per household per month in 2006 was just over two Euros, less than the price of a cup of coffee. German government figures show that the FIT law accounted for only 3.6% of the average electricity bill in 2006, despite 9 billion Euros (A\$13.8bn) of investment in renewable energy in that year.¹²⁶

In Australian jurisdictions, the fee payable is likely to be less, because the measures are unlikely to have a massive uptake in the short to medium term. With a small number of FIT generator payments spread across a large number of customers, the increase in the cost of electricity for individual households is likely to be relatively minor. A solution to the question of social equity is simply to exempt concession card holders from payment of the FIT component of an electricity account.

A neglected aspect of the topic of social equity impacts of renewable energy laws is the consistency of present laws and policies on electricity generation and carbon pricing with the principle of intergenerational equity, "namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the

¹²² See further: Tosh Szatow (2008) *Beyond Free Market Assumptions: Addressing Barriers to Distributed Generation*, April 2008, Consumer Utilities Advocacy Centre, Melbourne, 57pp. www.cuac.org.au

¹²³ Interview with the Chief Minister, Mr Stanhope, 666 ABC Local Radio, with Alex Sloane, Morning Show, 27 February 2008.

¹²⁴ ACT Chief Minister's Department (2007) *Feed-In Tariff Discussion Paper*, December, at 10-12.

¹²⁵ *Ibid* at 11.

¹²⁶ BMU - Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2007) *Renewable energy sources in figures – national and international development - June 2007*, www.bmu.de/english

benefit of future generations".¹²⁷ The principle of intergenerational equity is central to international environmental law such as the UN Framework Convention on Climate Change.¹²⁸

Another less commonly considered aspect of the debate over equity and feed in laws is the fact that FIT laws aim to involve the community, rather than just large energy generating companies. FIT laws are more equitable than MRET laws because they enable a far wider range of people and entities to participate in the growth of renewable energy. FIT laws present an economic opportunity to the community— because they present no major administrative or capital barriers, they enable the public to participate to a greater extent. The incentives offered to small generators are larger, and more ongoing than those available under small generator deeming provisions in the tradeable certificate legislation. FIT laws are likely to build greater acceptance of renewable energy developments because they involve the public in projects, by sharing opportunities.¹²⁹

Benefits – Encouraging Community investment

One of the benefits of FIT laws as opposed to the tradeable certificate model relates to lower administrative costs, entry barriers and transactions costs, thus enabling small investors such as individuals, cooperatives and small business to participate in investing in renewable energy development. This model of community ownership can assist to reduce NIMBY resistance to renewable energy developments, particularly wind farms. FIT laws build acceptance of renewable energy by sharing opportunity and enabling the public to participate in providing solutions to climate change and decarbonising the electricity sector.¹³⁰ It can also be said that FIT laws can deliver more capacity because there is an additional investment sector involved in bringing renewable generation capacity online. In terms of solar energy, Spain represents an example of the construction of community owned solar parks involving investment of fund raised from individuals and families from small communities, a phenomena encouraged by the legislative framework in that country.¹³¹ The relatively high rate of rural and regional unemployment in Spain has served to increase community acceptance of renewable energy projects, with 4000 jobs in the solar PV sector in 2007.¹³² In terms of wind energy, Germany and Denmark provide many examples of community owned wind farms with a high proportion

¹²⁷ *Protection of the Environment Administration Act 1991* (NSW), s.6(2)(b).

¹²⁸ UNFCCC, Preamble, Article 3(1).

¹²⁹ Paul Gipe, speech to Feed-In Tariff (FIT) workshop, Sunday, 2 March 2008, Washington DC, convened by World Future Council, Heinrich Böll Foundation, and Worldwatch Institute. <http://onlinepact.org/usstrategyworkshop.html>

¹³⁰ Paul Gipe, speech 2 March 2008, Washington DC, <http://onlinepact.org/usstrategyworkshop.html>

¹³¹ For example the solar parks constructed by Fotovoltaicas Navarra, near Olite, Navarra, Spain. See: www.fotovoltaicasnavarra.es, viewed 23.8.08.

¹³² del Rio, Pablo Unruh, Gregory(2007) "Overcoming the lock-out of renewable energy technologies in Spain: The Cases Of Wind and Solar Electricity" 11(7) *Renewable and Sustainable Energy Reviews* 1498-1513 at 1509.

of all installed capacity owned by cooperatives with local shareholders. This ownership style has helped to increase the level of community acceptance of wind farms in those countries.

Solar access law

Even if the law provides adequate financial incentives it will not induce additional investment unless other barriers to investment are addressed. One of these barriers is the question of guaranteed solar access. This is best addressed through amendments to State planning laws and local environmental planning instruments. This is typically done to ensure that solar access is guaranteed through the vehicle of suburb design so that every building in temperate climates can maximise passive solar gain. An associated goal should be to include regulation to prohibit the shading of solar PV and solar thermal collectors that result from tree growth occurring after a solar collector is installed. Solar access law should apply to protect the operation of solar systems for electric generation, water heating and space heating or cooling. For example it could state that no plant may be placed or allowed to grown such that it shades a collector more than 10% from 10 am to 2 pm.

Others, including Bradbrook, have written extensively on solar access, and it is not appropriate at this point to review all the detail of their proposals, other than to make the point that solar access should be addressed in State and local government land use planning legislation.¹³³ It is not appropriate to resolve such questions through provisions in Federal laws.

Investor Confidence and the role of planning law

Key factors in encouraging RE deployment are low administrative barriers and a stable policy environment that offers a long term guarantee of support. These factors may in fact be more important than the level of the tariff premium offered, according to Held, Ragwitz and Hass (2006). They wrote:

“It is often claimed that the high level of the feed-in tariffs is the main driver for investments in wind energy especially in Spain and Germany. However, the tariff level is not particularly high in these two countries compared with other countries analysed here. This indicates that a long-term and stable policy environment is actually the key criterion for the success of developing RES-E markets. As can be observed from a

¹³³ Bradbrook, (1988) “Future Directions in Solar Access Protection” 19 *Environmental Law* 167-208; (1985) “The Protection of Solar Access” 59 *Law Institute Journal* 1326-1329; (1984) “Solar Access Legislation” 58 *Law Institute Journal* 1054-1058; (1983) “Nuisance and the Right of Solar Access” 15 *University of Western Australia Law Review* 148-187; (1982) “The Development of an Easement of Solar Access” 5 *University NSW Law Journal* 229-262.

country like France, high administrative barriers can significantly hamper the development of wind energy even under a stable policy environment combined with reasonably high feed-in tariffs.”¹³⁴

Even with adequate financial inducements for renewable energy development via incentives legislation, investment may be jeopardised if strong perceptions develop that planning issues are unduly delaying projects. Both the international literature and Australian experience to date indicate that appeals against RE developments (wind farms in particular) have been very common, and often problematic for developers. Planning appeals can create significant uncertainty barriers to investment, particularly in wind power. Conflict involving the planning appeals system has been particularly fierce in terms of litigation and campaigns in the UK,¹³⁵ but also in New Zealand and to a lesser extent in Australia.¹³⁶ Planning approval difficulties have also been cited as important in France,¹³⁷ Sweden¹³⁸ and Japan.¹³⁹

¹³⁴ Held, Ragwitz, Huber (2006) “On The Success of Policy Strategies For The Promotion of electricity from renewable Energy sources in the EU”, *Energy & Environment* · Vol. 17, No. 6, 849-868 at 858.

¹³⁵ David Gow, Will Woodward “Green laws and regulation risk energy crisis, say Europe's power companies” The Guardian, February 7 2008. See also: Chapter 17 “Wind Farm Development and Environmental Conflicts” Holder and Lee (2007) *Environmental Protection, Law and Policy: Text and Materials*, 2nd edition, Cambridge Univ. Press, Law in Context Series, Cambridge, UK.

¹³⁶ *Taralga Landscape Guardians Inc v Minister for Planning and RES Southern Cross Pty Ltd* [2007] NSWLEC 59 (12 February 2007), *Perry v Hepburn SC* [2007] VCAT 1309 (27 July 2007), *Howard v Moyne SC* [2008] VCAT 377 (7 March 2008), *Synergy Wind Pty Ltd v Wellington SC* [2007] VCAT 2454 (21 December 2007). *Thackeray v Shire of South Gippsland* [2001] VCAT 739 (31 May 2001), *Thackeray v Shire of South Gippsland* [2001] VCAT 922 (31 May 2001), *Energy Equity Corporation Ltd v Glenelg SC* (1997/89087 & Ors) Administrative Appeals Tribunal of Victoria, Planning Division, Appeal Nos. 1997/89087, unreported. *Kittel & Vandeppeer v DC of Yankalilla & Wind Farm Devt*, No. ERD-02-547, ERD-02-593 [2002] SAERDC 131 (23 December 2002) *Power Lines Underground v Burnie City Council and D Armstrong obo Woolnorth Studland Bay Wind Farm Pty Ltd and E Roberts and G Robinson v Burnie City Council* [2005] TASRMPAT 235 (27 October 2005) *Ramholdt v Planning Panels Victoria* [2004] VCAT 2432 (3 December 2004) *Hislop & Ors v Glenelg SC*, 12 February 1999, VCAT Tribunal Application No. 1997/88762. *Hydro-Electric Corporation v Circular Head Council* [2001] TASRMPAT 176 (2 October 2001); *Macarthur Wind Farm Pty Ltd v Moyne SC* [2006] VCAT 1423 (19 July 2006), *Upson v Corangamite SC* [2005] VCAT 2267 (3 November 2005).

¹³⁷ Alain Nadai: “Planning”, “siting” and the local acceptance of wind power: Some lessons from the French case *Energy Policy* 35 (2007) 2715–2726.

¹³⁸ Patrik Soderholm, Kristina Ek, Maria Pettersson (2007) “Wind power development in Sweden: Global policies and local obstacles” 11 *Renewable and Sustainable Energy Reviews* 365–400 at 396.

¹³⁹ Japan follows Europe by tapping offshore wind power, Reuters, Jan 21, 2008. “ A plan to set up 16 huge turbines on the slope near the top of Mount Neko, 160 km north west of Tokyo, has been stuck in the planning stages since 2004.”

Drafting Details

The Bill proposes inserting a new Part 3A into the Renewable Energy Electricity Act 2000. It proposes co-locating provisions for a feed-in tariff in the same Act as that which created the market in renewable energy certificates (RECs).

There are a number of housekeeping matters which require attention. This will at a minimum require amendment of the objects clause of the REE Act. Section 3 states that the Act operates by means of certificates. This will require amendment, and addition of outline material which relates to Feed In tariffs. Questions then also arise in relation to whether Part 3A should be subject to the provisions of *Part 6--Objections, Reviews And Appeals*. Similarly it raises the question of whether the proposed clauses relating to the FIT Register should be included within *Part 10—Administration* or *Part 13—Registers* rather than within Part 3A.

In relation to the objects clause proposed, the Bill sets out an Object within cl.4 which will not be inserted within the REE Act. Instead, I suggest that an Objects clause be inserted within Part 3A of the Act, headed "Object of this Part". Without such a provision, the Objects in this proposed Act will be lost in the amending Act.

The objects clause (s.4) of the Milne Bill could be more ambitious. It focuses on explaining the mechanism of the legislation rather than its policy intentions. It emphasises the goal of 'commercialisation of a broad range of renewable energy technologies', but it does not refer to the objective of mitigating carbon emissions which will aggravate climate change. A better model is that of the ACT law. Section 3 provides as follows:

"The objects of this Act are to—

- (a) promote the generation of electricity from renewable energy sources; and
- (b) reduce the ACT contribution to human-induced climate change; and
- (c) diversify the ACT energy supply; and
- (d) reduce the ACT's vulnerability to long-term price volatility in relation to fossil fuels."

VII. CONCLUSION

This Submission has made the case that the Feed-in Bill to amend the *REE Act* deserves support.

Some legislators, commentators, and interest groups still hold positions of opposition to renewable energy, often on the grounds that the provision of support to any industry is indefensible, or that economic modelling suggests assistance will result in excessive economic opportunity costs and even job losses.¹⁴⁰ This is a blind spot, given the readiness with which support and subsidies were proposed for nuclear energy during the Howard years, and more recently committed by the Rudd government to “clean” coal via a \$500m National Clean Coal fund (\$1.5 billion support if industry components are secured).

A vital step has been taken by expanding the national target to 20% of generation by 2020.¹⁴¹ National geographical features aside, New Zealand’s target of 90% renewable generation by 2025 could perhaps serve as some inspiration to go a little further than 20%. To achieve this target, a key choice is whether or not to expand the mandatory renewable energy target law (MRET), or to explore the alternative option of feed-in tariff legislation. If the international and particularly European experience serves as a guide, feed-in laws could assist us to meet these targets sooner. Given the federally expressed desire for national harmonisation of renewable energy laws, a compromise option would be to include feed in or fixed price elements or multipliers into the Commonwealth MRET law in order to target particular technologies such as photovoltaics.¹⁴²

The international literature on the effectiveness of Feed-in Tariffs (FIT) relative to MRET laws indicates that FIT laws have generally had greater success in encouraging greater levels of renewable energy deployment. Four key reasons emerge. The first is the empirical evidence of their success relative to renewable portfolio standard laws when assessed in relation to the rate of deployment, cost-efficiency and innovation. The second is that greater levels of investment appears to be due to their guarantees of financial support, which avoids the problems of uncertainty and a stop-go investment cycle commonly associated with renewable portfolio standard laws, illustrated by the investment crash in Australia in 2005-2007 following the

¹⁴⁰ For example, the Australian Petroleum Production and Exploration Association, submitted to the Garnaut Review that the Federal renewable energy target would indirectly cost \$1.8 billion and 3600 full-time jobs. See: Wilkinson, M., “Renewables policy under attack”, *Sydney Morning Herald*, 29.4. 2008

¹⁴¹ The New Zealand target of 90% renewable generation by 2025 could serve as an inspiration to go a little further than 20%. See NZ Energy Strategy (2007), op.cit., p.17.

¹⁴² For further discussion of these options, see: Rickerson, Wilson H., Sawin, Janet L., Grace, Robert C (2007) If the Shoe FITs: Using Feed-in Tariffs to Meet U.S. Renewable Electricity Targets, 20(4) *The Electricity Journal*.

Howard government decision not to expand the Federal MRET incentive. The third is the fact that feed-in laws typically include provisions which address problematic grid connection issues and the tendency of incumbent electricity utilities to engage in strategic behaviour against new renewable energy market entrants. Fourth is the fact feed in tariff laws better assist to build a diversified portfolio of renewable energy options which has considerable economic and strategic value.

This submission has explained the way in which the introduction of feed in legislation is likely to face a number of obstacles. Chief amongst these are (i) the neo-liberal preference for MRET over feed-in laws, on the basis of a questionable assumption that tradable certificate laws are a more thoroughly market-based instrument; and (ii) the likely resistance of incumbent electricity utility interests to the trend to distributed and decentralised generation that is represented by FIT laws.

If policy makers choose to avoid the perceived risks associated with feed-in laws, and instead rely upon expansion of the existing mandatory renewable energy target legislation based on tradable certificates, it is likely that only a narrow and range of renewable generating technologies will be deployed, principally those closest to market competitiveness such as large-scale wind power. If legislators consider the option of enacting feed-in laws across Australia, they would send a signal of support to a much broader portfolio of renewable electricity generating options. With the flexibility to introduce a range of stepped tariffs within a feed-in law (targeted at particular bands of technology), a range of technologies could be more effectively supported. This would enable Australia to gain greater global market share in the renewables industry, and to capitalise on opportunities in that growing market, whilst ensuring that Australia has the expertise and experience in renewable energy to achieve deep cuts in emissions within the timeframe required, particularly should future science indicate that even deeper cuts are required. If Australia relies solely on emissions trading (and particularly an internationally linked emissions trading system) to send a credible price signal and policy message to reduce the carbon intensity of electricity generation, it runs the risk of being unable to meet scientifically based targets for deep cuts of 80-90% of 1990 emission levels by 2050.

Table: Comparison of European and Australian Models

Jurisdiction	Mechanism	Premium rate paid	Net/Gross Metering	Capacity limitations	Network access guarantees	Allocation of Grid upgrade liability	Tariff Degression	Sales into Spot Market
SA	PV only	Yes	Net	Yes	No	No	No	No
Victoria	Wind, solar, biomass, biogas, hydro	No obligation	Not specified	Yes, 100Kw capacity	No	No	No	No
Queensland	Small PV only	Yes, 44 cents per kilowatt hour will be offered until 2028	Net	Yes - maximum of 10kVA for single phase connection and 30kVA for three-phase power	Obligation on distribution entity to connect (s.44A(1)(b))	No	No	No
ACT	All	Yes	Gross	Yes, 75% of premium only payable to larger installations	Yes, plus protections in s.102 <i>Utilities Act</i>	No	No	No
Milne Bill	All	Yes	Gross	No	No	No	No	No
Germany	All	Yes	Gross	No	Yes	On network operator	Yes (by percentage)	No
Spain ¹⁴³	All	Yes	Gross	No	Yes	On network operator	Yes (by review)	Yes

¹⁴³ http://www.appa.es/descargas/RD_661_2007reg_esp.pdf

VIII. APPENDIX – AUSTRALIAN STATE FEED-IN LEGISLATION

South Australia

The SA feed-in law was passed in February 2008, after having been initially released for public comment in August 2007 as the *Electricity (Feed-in Scheme - Residential Solar Systems) Amendment Bill*. This passed the State's Legislative Council in November 2007, with some significant strengthening amendments. However, disagreement between the Houses over the final form of the Bill meant the legislation did not pass until mid February 2008. One reason for its eventual passage in a stronger form than the draft Bill was due to the public focus on the issue provided by the simultaneous hosting of the International Solar Cities Conference in Adelaide in February 2008.

The incentives offered by the Act were improved after several amendments were forced onto the Government in the Legislative Council. These were eventually accepted, and increased the payment period from 5 years to 20 years, and broadened the scope of application of the Bill to include small businesses and community organisations (e.g. schools) as well as residential customers.

The provisions, inserted into the *Electricity Act 1996*, apply to qualifying generators, defined as small photovoltaic generators¹⁴⁴ that are connected to a distribution network in a manner that allows electricity generated by the small photovoltaic generator to be fed into the network. Licensed operators of a distribution network are required to pay the domestic customer who is operating a small photovoltaic generator an amount of \$0.44 per kWh (approximately twice the retail price) for any electricity fed into the network, once this amount has been set-off against the charges payable by the qualifying customer for the supply of electricity before 12 months after the end of that billing period.¹⁴⁵ This Feed in Tariff is a 'distributor based' model, it is not a retailer based scheme, and does not place obligations on retailers of electricity.¹⁴⁶ Under a retailer model, retailers would be required to offer the special feed-in rate to PV owners for electricity returned to the grid and then to recover that cost burden from across their customer base.

¹⁴⁴ With capacity up to 30kVA for a three phase connection.

¹⁴⁵ *Electricity Act 1996* (SA), s.36AD(3).

¹⁴⁶ The implications of this difference are discussed in detail in the SA discussion paper at 20-24.

Primary drawbacks include the fact that the tariff of \$0.44 per kWh is only payable to domestic customers on net exports of power generated,¹⁴⁷ and that it only applies to small scale solar PV, not to solar thermal, wind or geothermal. The legislation is set to expire in 2028, thus effectively offering a 20 year period during which the incentive will be offered (subject to future legislative amendment).¹⁴⁸

Australian Capital Territory

In the Australian Capital Territory, a private members Bill, the Electricity Feed-in (Solar Premium) Bill 2007 was released in exposure draft form by Mick Gentleman MLA on 14 November 2007. The Bill was tabled in the Assembly in April 2008, re-named more broadly as the *Electricity Feed-in (Renewable Energy Premium) Act 2008*, and passed in July 2008, to commence operation before 1 July 2009.¹⁴⁹

Key features of the ACT law that differentiate it from South Australia are that it provides the FIT on the basis of gross metering, rather than net metering.¹⁵⁰ The premium payable is not stepped or differentiated according to the technology involved, which is a point of difference from European models. The rate payable is 3.88x the domestic retail electricity price¹⁵¹ which gives a payment of approximately \$0.50 per kWh. This incentive is subject to annual revision, against statutory criteria, but that rate then remains applicable for a 20 year period.¹⁵² The incentive is only offered to RE from solar and wind generation, although the Bill provides for the making of a regulation to specify other renewables as eligible sources.

The electricity distributor has an obligation to connect the renewable generator to the network and must buy the electricity at the premium specified by the legislation, which varies according to the total capacity of the generator.¹⁵³ If the total capacity of generation at a given address is more than 30kWh then the distributor is only obliged to pay 75% of the premium rate.¹⁵⁴

¹⁴⁷ This is evident from the drafting of s.36AD(3) contained within Part 3, Division 3AB of the *Electricity Act 1996* (SA), and from Government of South Australia (2007) *South Australia's Feed-In Mechanism for Residential Small-Scale Solar Photovoltaic Installations: A Discussion Paper*, February, at 1.

¹⁴⁸ It is not possible to bind a future Parliament via a legislative provision, and therefore any guarantee offered by legislation cannot be absolute.

¹⁴⁹ *Electricity Feed-in (Renewable Energy Premium) Act 2008* at www.legislation.act.gov.au

¹⁵⁰ s. 6(3) *Electricity Feed-in (Renewable Energy Premium) Act 2008*, "The distributor must pay the occupier for the total amount of electricity supplied to the distributor's network from renewable energy generators at the occupier's premises.."

¹⁵¹ s. 9(4), *Electricity Feed-in (Renewable Energy Premium) Act 2008*

¹⁵² s.10, *Electricity Feed-in (Renewable Energy Premium) Act 2008*

¹⁵³ s. 6., *Electricity Feed-in (Renewable Energy Premium) Act 2008*

¹⁵⁴ s. 6(3)(c), *Electricity Feed-in (Renewable Energy Premium) Act 2008*.

The ACT Act is similar to the SA Act in that it applies to the distributor not the retailer.¹⁵⁵ It differs from the SA Act in that it is available to the occupiers of all premises who are qualifying renewable electricity generators, not just to such generators who are domestic residential electricity customers. In this way, it offers the feed-in incentive to commercial premises as well as residences.

Notable omissions include a decision not to address planning law issues and solar access law. The Act does not include a German style clause addressing the risk of strategic behaviour by utilities in terms of connection and network upgrade charges. Although it requires grid connection it does not oblige RE connection as a priority, and it does not address the question of liability for upgrades of the grid. However it must be said that in Australia, these connection issues are only able to be addressed on a national scale with amendments to Chapter 5 of the rules contained in the *National Electricity Law*.

The ACT Feed-in law is supplemented in its operation by protective provisions in the Utilities Act 2000 which prohibit electricity suppliers from discriminating against persons who supply alternative energy services. That Act provides (s.102) as follows:

Alternative energy—supply utilities not to discriminate

(1) If a person uses or supplies alternative energy services, an electricity supplier must not, for that reason only—

- (a) refuse to supply electricity to the person; or
- (b) supply electricity to the person on terms that are less advantageous than the terms of the supplier's standard customer contract.

Queensland

Solar feed-in provisions very similar to those in South Australia, have been enacted in Queensland, in Solar Bonus Scheme.¹⁵⁶ The rate is the same as paid in SA, at 44c/kWh, which in Queensland is approximately three times the general domestic use tariff of 16.29c/kWh (inc GST as at 1 July 2008).¹⁵⁷ The feed-in tariff is only available to grid-connected PV installations. It is not limited to residential customers, but to all small electricity customers, those who consume no more than 100 megawatt hours (MWh) of electricity a year.¹⁵⁸ Although the tariff scheme is set for a 20 year period to 2028, the most significant detraction from the Queensland tariff is that it is to be paid only on a net export basis. In other words, the earnings from feeding-in to the grid are to be offset from billing. This is performed by calculation from meters

¹⁵⁵ S. 6, *Electricity Feed-in (Renewable Energy Premium) Act 2008*.

¹⁵⁶ These provisions were included in a Bill covering a number of topics regarding electricity, on 29 April 2008.

¹⁵⁷ *Clean Energy Act 2008*, Part 12, inserting ss.44A and 55DB into the *Electricity Act 1994* (Qld).

¹⁵⁸ The average Queensland household, according to the Department of Mines and Energy, uses 10 MWh a year.

that record exports over each half hour period. According to the Second Reading Speech "The scheme rewards customers whenever they generate more electricity than they are using—not just the balance at the end of the quarter, but whenever generation exceeds consumption during the day. The amounts exported from time to time throughout the day will be accumulated throughout the quarterly billing period and the customer's solar bonus payment for this surplus electricity will be credited at 44 cents per kilowatt hour against charges for the electricity taken by the consumer from the grid during the billing period."¹⁵⁹ According to DME: "If the solar bonus payments are greater than the total grid-connected electricity consumption charges over a 12-month period, the customer is entitled to have this balance refunded, rather than maintaining an ongoing credit with the retailer."¹⁶⁰

Victoria

Victoria has enacted legislation for a very limited form of FIT, via the *Energy Legislation Amendment Act 2007*, No. 35/2007, which inserted Division 5A into the *Electricity Industry Act 2000*. That Act requires that retailers purchase electricity from small renewable generating facilities. It also requires them to publish prices and terms and conditions for the purchase of that electricity. The Act, which came into operation on 1 January 2008, covers renewable energy generated by wind, solar photovoltaic systems, hydro electric and biomass facilities.

The reason why the Victorian legislation is limited, is that it only requires publication of feed-in details and that an offer must be "fair and reasonable". It does not mandate payment of a premium tariff above the retail rate. The Act provides that if the Minister for Energy and Resources is not satisfied that the prices, terms and conditions of a retailer's feed-in tariff offers are fair and reasonable, the Minister may refer those prices, terms and conditions to the Victorian Essential Services Commission for assessment.¹⁶¹

Division 5A is headed "Terms and conditions for the purchase of small renewable energy generation electricity". The Act requires that retailers: purchase electricity from small renewable generating facilities and publish prices and terms and conditions for the purchase of that electricity. The Act covers renewable energy generated by wind, solar photovoltaic systems, hydroelectric and biomass facilities. It came into effect on 1 January 2008. The Division mandates that retailers holding a licence to sell electricity in Victoria offer a feed-in tariff to their customers. The Act applies to retailers who have a minimum of 5000 customers and to

¹⁵⁹ Hansard, 2nd Reading Speech, Clean Energy Bill 2008, 29.4.08, p.1241` .

¹⁶⁰ http://www.dme.qld.gov.au/Energy/solar_feed_in_tariff.cfm

¹⁶¹ <http://www.esc.vic.gov.au/public/Energy/Consultations/Feed+in+tariffs/Feed+in+tariffs.htm>

small renewable energy generation facilities that have an installed or name plate capacity of less than 100kW.¹⁶²

Arguably this is not a true FIT law because this legislation does not set a price for renewables, nor does it guarantee a premium price over a given time period. It all depends on the Ministers' position on whether or not he/she can be bothered to refer a problematic price offer (ie too low) to the Essential Services Commission for a determination of whether the offer is "reasonable". (see s.40I, 40J). Then the Minister makes a declaration based on the Commission's report (s.40M). The Act contains a requirement that retailers/licensees must keep their internet sites containing Feed in Offers up to date (s.40N). The ESC's Draft Guidance of January 2008 on what is a "Reasonable" offer to the small generators is instructive. It is defined as a price not less than 1 for 1 pricing. This is not on a par with the premium prices offered in other jurisdictions of 3-4 times the standard retail tariff.

¹⁶² *Electricity Industry Act 2000* (Vic), s. 40F.