carbon market economics
towards a low carbon economy

ABN 23 128 476 415

Level 16, 90 Collins Street
Melbourne, 3000
Tel 61 (0)3 9664 0680

20 July 2009

The Secretary
Senate Economics Legislation Committee
PO Box 6100
Parliament House
CANBERRA ACT 2600

Dear Mr. Hawkins

You invited us to make a submission to the Economics Legislation Committee's inquiry into the Renewable Energy (Electricity) Amendment Bill 2009.

In our submission we have tried to provide analytical insights on relevant issues. The submission considers in turn the following three questions:

- Why subsidise renewable electricity?
- Will the Renewable Energy Target (RET) succeed?
- Are the proposed exemptions from REC liability appropriate?

The submission is attached to this letter.

Yours sincerely

Bruce Mountain
Director

Carbon Market Economics' submission to the Economics Legislation Committee's inquiry into the Renewable Energy (Electricity) Amendment Bill 2009

20 July 2009

Table of contents

1 Why subsidise renewable electricity?

What has the Mandatory Renewable Energy Target achieved so far?

The Australian Government has had a policy to promote the development of renewable electricity since 1997. In that year, then Prime Minister John Howard announced the creation of the Mandatory Renewable Energy Target (MRET) as a subsidy scheme to promote the development of renewable electricity generation capacity in Australia. The stated motivation for this was to position Australia to capitalise on the expected growth of renewable generation technology in Asia. The legislation to enact MRET was passed in 2001, around the time or a little before similar schemes were implemented mainly in the US and subsequently also Britain and a few other countries in continental Europe.

The annual Renewable Energy Certificate (REC) target for the original MRET scheme has been achieved in most years, although there have been REC shortfalls after accounting for REC demand from Green Power. Total REC supply has been increasing, despite the reduction in REC creation from Hydro Tasmania and Snowy Hydro. The REC market currently has a cumulative surplus of around 6 million RECs – roughly equivalent to the 2008 MRET target. We expect that the cumulative surplus is likely to increase by the end of 2009.

The REC surplus is largely attributable to the very significant uptake of renewable energy certificates created by solar water heaters and heat pumps (which use renewable sources - radiant sunlight or ambient heat - to produce hot water). RECs created from these sources accounted for more RECs than any other REC-eligible technology in 2008.

Around 1,200 MW of wind capacity, 200 MW of biomass and around 30 MW of solar PV capacity has been developed since the implementation of MRET.

The total renewable electricity capacity added since the implementation of MRET now produces just 1.5% of Australia's electrical energy. Australia's development of renewable capacity since 1997 has been small in comparison to the rate of renewable capacity development in many developed, and developing economies. While the scheme has so far succeeded in promoting the uptake of solar water heaters and heat pump water heaters, its contribution to the development of a renewable electricity industry in Australia has been modest. It would be hard to argue that the scheme has met its stated policy objective of positioning Australia to serve growing markets for renewable electricity in Asia.

The debate over whether it is wise to subsidise renewable electricity to achieve emission reductions has not been resolved

The promotion of renewable electricity appears to enjoy broad political and community support in Australia. Also, judging by the uptake of voluntarily procured renewable energy in Australia (Green Power)[1] there appear to be many individuals and corporations that are willing to pay more for energy that is produced from renewable resources.

However, there is a significant community of policy analysts in Australia who disagree that renewable energy should be subsidised. For example, the Productivity Commission and the Wilkins Review suggest that to reduce greenhouse gas emissions, renewable electricity subsidies should only be contemplated if it can be conclusively demonstrated that broad-based market measures – such as an emissions trading scheme – will fail to achieve their objectives.

The assumption that underlies this advice is that bureaucracies fail more frequently and severely than markets. And so, it is argued, governments should seek to achieve their objectives by including into the prices of goods and services ("internalising"), the cost of the social, environmental or other detriments ("externalities") that the production and consumption of those goods and services give rise to. Producers and consumers will then respond to those prices in the normal way of markets. Through this, social and environmental objectives will be achieved but with the minimum administrative interference.

This may be an intellectually persuasive philosophy in view of the long track record of the failure of administrative intervention to deliver efficient outcomes. However the success of this "internalisation" approach relies on the assumption that whatever prices are needed to deliver environmental objectives – such as emissions reductions – will be politically and socially acceptable.

Modelling by the Federal Treasury (and others) suggests that achieving the level of emissions reductions needed to avoid dangerous climate change will require very high emissions prices, particularly in the absence of effective international emissions trading.

High emission prices will have a large impact in Australia where our greatest source of anthropogenic emissions – coal-fired electricity generation – is also the reason that large industrial and resource users enjoy cheap electricity and thereby gain a significant comparative economic advantage from which they and Australian generally, benefit. It will take a large emission price before coal and gas-fired generation is rendered less competitive than other low emission technologies.

[1] In 2008, annual Green Power demand was 1.5 TWh.

The Australian Government has so far been reluctant to contemplate emission prices anywhere near as high as its modelling suggests would be required to deliver the level of emission reductions recommended by, for example, the Inter-Governmental Panel on Climate Change, and the Stern and Garnaut reports.

Evidence of the Government's reluctance to accept high emission prices can be seen, for example, in the Government's proposals for starting year emission prices of $10/tonne CO2e, price caps in the following years, and an emission reduction target (at this stage) of just 5% of 2000 levels by 2020.

If the necessary level of emission reductions will not be delivered by the main emission policy – the Carbon Pollution Reduction Scheme – then other ways need to be found to reduce emissions. This seems to be the most compelling argument to consider other ways to reduce emissions including by subsidising renewable electricity, or through mandatory product energy efficiency standards or the subsidisation of energy efficiency.

While there is strong support in Australia for broad-based market measures such as an emissions trading scheme, many appear to have turned a blind eye to the fact that constraining the trading scheme as the Government intends to do (through low emission reduction targets and price caps) will not deliver the necessary level of emissions reductions.

In other advanced market economies that have adopted aggressive renewable subsidy policies (such as Germany, Texas, the eastern and western states of the US, all the Scandinavian countries, Spain, Portugal, Britain, Holland and others) there appears to have been less controversy over whether to subsidise renewables as well as have an emission trading scheme. It may be that in other countries there is less concern about possible inefficiencies that result from the introduction of a renewable energy subsidy, because such subsidies offer other benefits such as greater energy independence.

The failure to resolve the debate on the role of renewable electricity subsidies in emission reduction underlies the lack of clarity on the objectives that the Government is seeking to achieve with the proposed legislation

We have drawn attention to this unresolved debate because we think that the failure to resolve it underlies the lack of clarity on the policy objectives that the Government is seeking to achieve with the RET. Specifically, it is not clear whether the proposed legislation is meant to:

1. Reduce emissions at the lowest costs, to compensate for shortfalls in the CPRS; or
2. Stimulate the development of a diversified renewables industry; or

3. Promote renewable electricity production; or
4. Promote renewable energy; or
5. Promote energy security?

The pursuit of some of these objectives will be to the detriment of others. For example the promotion of renewable electricity would be achieved by excluding solar water heaters and heat pumps from earning RECs, while the promotion of renewable energy would lead to their inclusion. Similarly, stimulating the development of a diversified renewables industry would be consistent with multipliers for REC from favoured technologies (as the proposed legislation allows), while reducing emissions as the lowest cost would mitigate against this.

The lack of clarity on the purpose of this legislation is evident even in its title "Renewable Energy (electricity) Amendment Bill": is the purpose to support renewable energy or renewable electricity?

2 Will the RET succeed?

The RET is likely to have a significant impact on electricity prices, particularly for large energy users who do not qualify for partial exemption from the obligation to acquit RECs for the electricity they consume. To renewable energy developers, it is by far the largest source of subsidy available in Australia. In terms of its dollar, political and environmental impacts, the expanded RET is a very significant policy.

To assess whether the amended legislation will succeed, it is necessary to first define success. As discussed above, we don't think it is clear what the Government's objectives with this policy are. In the absence of such clarity we have deduced the following two over-arching objectives, the first based on the Labor Party's 2007 election commitment, and the second based on the expectation that the Government is likely to prioritise efficiency and effectiveness:

1. To ensure that 20% of Australia's electricity supply is from renewable sources by 2020.
2. To maximise the renewable electricity delivered per dollar of subsidy provided through RECs.

Will the 20% target be achieved?

We think it is very unlikely that the target of 20% of Australia's electricity supply from renewable resources by 2020 will be achieved. There are several reasons for this:

First, solar water heaters (SWH) and heat pumps are eligible to create RECs. REC creation from these technologies currently dominate the REC market. In 2008, around 40% of all

RECs were created by SWH and heat pumps, more than from wind generation, and much more than from any other REC-eligible resource.

Since the start of 2009 electricity year, more RECs have already been created from SWH and heat pumps (more than 3 million) than were created from this technology source in all of 2008. We expect that by the end of this year RECs from SWH and heat pumps will have grown by a factor of 40 in the eight years from 2001. With the current RET and other Federal and State subsidy arrangements it is very unlikely that REC creation from SWH and heat pumps will decline in future. To the contrary, momentum for the installation of SWH and heat pumps has grown. Unless State subsidies change, and assuming no change in REC eligibility, we think it is likely that this technology will have a significant if not dominant impact on REC supply at least in the period to 2020.

From the perspective of greenhouse gas emission reductions, the significant growth of the SWH market is a fantastic success: many tonnes of emissions from Australia's coal fired plant have been avoided by using the sun to heat water. Per unit of subsidy, SWH and heat pumps offer amongst the lowest cost greenhouse gas emission abatement of all renewable generation or energy efficiency options. As such, allowing SWH and heat pumps to create RECs it is likely to increase the supply of the relatively inexpensive RECs, and thus depress REC prices. If the application of renewable energy to heat water can earn RECs, the obvious question is why the application of renewable energy for space condition is not also eligible to create RECs.

However, every REC supplied by renewable thermal energy sources is one less that needs to be supplied by renewable electricity generators over the full life of the RET scheme. If the market share of SWH and heat pumps rising from the current 5% of Australian houses to 50% by 2020, this will result in the creation of around 120 million RECs. This is roughly 40% of the cumulative total annual REC target between 2010 and 2020. The application of heat pumps in commercial, and hotel accommodation is likely to be a significant further source of RECs. The supply of RECs from SWH and heat pumps is likely to mean that the MRET target may well be met by 2020, but in the process renewable electricity generators are likely to be crowded out of the market, and hence the Labor Party election commitment of 20% renewable electricity generation by 2020, is not likely to be met.

This creates a dilemma: if the Government changed the arrangements so that SWH and heat pumps were no longer eligible to receive RECs, this would drastically increase the demand for RECs from renewable electricity generators, which will cause the price of RECs to rise which will have a detrimental impact on energy users. However continuing to allow SWH to create RECs will crowd-out renewable electricity generators thus undermining the delivery of the Labor Party election commitment.

A possible counter argument is that the cumulative annual demand for RECs in the 9 years from 2021 to 2030 is 450 million RECs, and that renewable electricity developers will look

past the impact of solar water heaters and heat pumps on REC creation in the short to medium term, taking comfort in the fact that a very large demand for RECs after 2021 will provide the necessary subsidy. We are sceptical about this argument mainly because the present value of RECs for future delivery is likely to be heavily discounted since:

- REC shortfall penalty is not indexed for inflation;
- The length of time that RECs will be banked; and
- Substantial sovereign risk is likely to translate into high discount rates.

The proposed legislation has included provision for a review of the treatment of SWH in 2015. It could be that in that review, the Government could decide to limit the ability for SWH or heat pumps to create RECs. In this case, the 2020 target would indeed be a renewable electricity target. Assuming the target remains at 45 million RECs in 2020, this means that the supply of RECs from renewable electricity generators would need to grow to this level by 2020. REC supply from non-SWH sources in 2008 was around 4 million. In other words, renewable electricity production would need to grow more than 11 times over the 11 years from now to 2020.

We think it is very unlikely that such a rapid expansion in renewable electricity generation can be achieved in such a short time. The main barriers are likely to be planning and supply chain constraints in the construction of enormous amounts of additional renewable capacity (most of which is likely to be wind powered); and the difficulty of connecting so much additional capacity onto the power system in such a short time.

Is the RET an economically efficient approach?

In this context economic efficiency means delivering renewable electricity for the lowest possible subsidy.

Renewable electricity subsidy schemes can be classified in two categories:

- Volume quota schemes - such as the RET - where the volume (the quota) is defined, and the price of the subsidy (in the case of the RET it is the REC price) is determined by the marginal cost of the last REC needed to meet demand;

- Price-based schemes such as feed-in tariffs or up-front capital grants where the price is defined, and the volume is determined by the supply willing to accept that price.

The advantages and disadvantages of these two fundamentally different subsidy mechanisms has been the subject of extensive examination and debate in Europe and

North America over the last decade.[2] Despite the significance of this fundamental design issue, the Government did not raise this in its consultation. Instead, the Government seemed to assume that the Labor Party's election commitment to achieve 20% renewable electricity by 2020 would be achieved by expanding the existing MRET, without considering whether this was the best way to achieve the objective.

We have three main concerns about the choice of the RET as the most effective subsidy mechanism. The rest of this subsection sets out these concerns

The expanded RET may not deliver investment certainty

Investors in renewable electricity plant value certainty of their future income in order to decide whether to invest. Their main income sources will be from the sale of electricity (for all REC-eligible plant except SWH); and from the sale of RECs over the life of the scheme. If the future price of RECs is uncertain, investors will discount the future income stream in deciding whether to invest. This uncertainty has an economic cost: REC prices will need to be higher than they would otherwise need to be to achieve a specified level of investment. Effectively by providing certainty, a lower subsidy will be needed to encourage investors to invest. Of course Government (or energy users) would be absorbing risks in providing such price certainty to suppliers, and this would not to be considered further in deciding whether it would be economically beneficial to do this.

Some sources of uncertainty (such as how future costs will change, how technologies will develop and how electricity prices will change) are sources of uncertainty that are endemic to most actively traded markets. We are not suggesting that the Government should necessarily seek to absorb these 'conventional' market uncertainties in promoting an efficient renewable electricity market, any more than it is should seek to absorb such uncertainties in the market for other traded products.

Rather, the main source of additional uncertainty for which the Government is accountable, is that the Government will change the design and operation of the expanded RET scheme in future, or change other subsidies that are likely to have a significant impact on REC supply. The RET is a contrived market. In the recent past there have been some significant changes including the possible development of a number of state schemes, the inclusion of gas-boosted solar water heaters in MRET, and significant changes in State and Federal government capital subsidies for SWH. The proposed legislation will introduce further significant changes including the expanded target, small generating unit multiplier, and REC exemptions for some electricity consumers. The Government has also proposed five-yearly reviews, which have the prospect of changes that could significantly affect future supply

[2] See Rickertson, W. and Grace, C. February 2007. "The debate over fixed price incentives for renewable electricity in Europe and the United States: Fallout and Future Directions, A White Paper." Prepared for the Heinrich Boll Foundation, Washington, USA.

and demand, and hence REC prices. A change in Government could result in further significant change to scheme design. The uncertainty about changes in the design of the scheme, and related subsidies is likely to be reflected in REC prices (and hence subsidy levels) that are higher than they would otherwise need to be to.

Price-based subsidy schemes, such as feed-in tariffs offer the prospect of greater income certainty. Like fixed interest rate mortgages, feed-in tariffs will have fixed terms for the life of the tariff. While the Government may change those terms for future tariffs, the existing players have a specified subsidy guarantee for the life of their tariffs. Up-front capital grants also reduce investment risks associated with renewable electricity plants. Such price-based subsidy mechanisms may therefore reduce investment risks attributable to changeable government decisions, and thereby reduce the level of subsidy needed to secure a specified increment of renewable generation.

The expanded RET may not direct subsidies to the most efficient technology

One of the main arguments for quota-based schemes such as the RET is that, in principle, they facilitate competition amongst the competing suppliers of RECs. In principle, the most cost-competitive technology will be the most successful in creating RECs and hence the greatest proportion of the subsidy will be directed to this technology. In this way, in theory, quota based schemes deliver efficient outcomes.

However the efficiency of quota schemes is degraded if the scheme is altered to discriminate amongst technologies. The RET already allows the creation of deemed RECs for SWH, heat pumps and small generating units. As discussed earlier, this turns a production subsidy into a capital subsidy. By reducing the capital outlay deeming provides a competitive advantage to SWH, heat pumps and small generating units, relative to other plant.

The proposed legislation also entails providing multiple RECs for the electricity produced by small generating units (which will be dominated by photovoltaics). Through this proposed change, small generating units will receive five times as much subsidy as other REC-eligible technologies. Per unit of renewable electricity produced, small generating units are significantly more expensive than available alternatives such as centrally dispatched wind or biomass based generating plant.

Buy-side concentration could detrimentally affect the competitiveness of the renewable electricity market

The RET operates by placing a mandatory requirement for electricity retailers and major transmission-grid connected energy users to buy a number of RECs each year, in proportion to the electricity they supply (retailers) or purchase (grid-connected customers). It is these retailers and grid-connected customers that constitute the "buy-side" of the REC

market. However, a few retailers, who are vertically integrated in that they own or control a significant amount of generation to meet their end-customer demands, supply most of Australia's electricity. In the major south and eastern states of Australia, electricity supply is dominated by a few of major retailers – Origin Energy, AGL and Truenergy. In Tasmania retail supply is dominated by a single, State-owned retailer. The Government of New South Wales' is in the process of privatising its retailers and it is likely that this will result in yet further concentration of retail electricity supply in that State.

The implication of this concentration is that these retailers have a very strong position in the negotiation for the purchase of renewable electricity. Through their customer relationships they also have a competitive advantage in the management of market risks. This provides a competitive advantage to these retailers in the development of renewable capacity and is likely to mean that investment in renewable generation (other than from SWH or distributed generators such as small generating units) will be dominated by the vertically integrated retailers.

This will have implications for the distribution of the profits from renewable electricity production (more going to the retailers than the renewable generators) and therefore the sustainable entrance of renewable independent power producers. This is likely to have a detrimental impact on the competitiveness of the renewable electricity sector. In this way the proposed REC arrangements may not maximise value for money.

This issue is significant because there is an alternative approach - feed-in tariffs or similar price-based subsidy mechanisms – that can be adopted to provide greater opportunity for independent power producers, and thereby promote active supply-side competition.

3 Are the REC exemption arrangements appropriate?

The legislation proposes that some electricity consumers should be partially exempt from the requirement to acquit RECs. These exemptions are based on the electricity purchased by emission-intensive trade-exposed entities. Through this, the REC exemptions are linked to the allocation of free emission permits to trade-exposed entities. Two questions that we think the Committee may want to consider further here are:

- Whether REC exemptions should be linked to the allocation of free emission permits?
- Whether the proposed REC exemption arrangements are equitable and efficient?

Should exemption be linked to the allocation of free emission permits

A policy argument for linking REC exemption to the allocation of free permits is that the expanded RET is an emission abatement policy and so compensation arrangements developed under the CPRS should apply in the same way. The counter to this, is that the Government has not established that expanding the RET is an emission-abatement policy. As discussed, there are many features of the RET (such as deeming, inclusion of SWH, multipliers for small generating units) that would lead one to the conclusion that the expanded RET is as much an industry development policy as it is an emission abatement policy. If it is an industry development policy, then on what basis should some category of energy users be treated differently? On this argument, the proposed arrangements might be considered unfair. In addition, the compensation arrangements under the CPRS are linked to the level of global co-operation on emission trading. If such global co-operation is achieved, and the emission trading compensation provisions are reduced, would it be appropriate to also reduce the REC exemption arrangements?

An alternative way to handle REC exemption would be to treat it separately to the CPRS, but have some form of exemption for trade-exposed industries linked to the impact of renewable subsidies in Australia to those in Australia's main trading partners. For example, if Australia has a renewable electricity obligation of 20%, but its main trading partners have obligations of 10%, then some form of exemption might apply to the most trade-exposed electricity users in Australia. If this, approach was used, it is likely to significantly reduce the compensation envisaged in the legislation because most of Australia's trading partners already have a much higher penetration of renewable electricity, and in several cases have more ambitious renewables expansion targets than Australia.

An alternative approach to equity could be to try to equalise the proportionate impact of REC obligations on the final electricity price. For Australia's largest electricity users – many of whom are eligible for compensation under the CPRS – the inclusion of the REC obligation will be a much larger proportion of the delivered price of electricity than it is for smaller electricity users, where the additional REC obligation will be attenuated by distribution and transmission costs which can be more than 60% of the total cost of supply for small customers. On this basis, some form of proportionate reduction in the REC obligation for large price-sensitive energy users could be appropriate on the grounds of equity. However, it is difficult to distinguish price-sensitive large electricity users, from those that are able to pass on to their customers a large part of any input cost changes they may face. This difficulty undermines the validity of implementing proportionate reductions in REC obligations for large energy users, relative to small energy users.

We do not think the Government's proposed REC exemption arrangements are necessarily wrong on equity grounds. However, this issue should be assessed with reference to the Government's objectives in expanding the RET. The Government's proposed RET exemption provisions are consistent with the definition of the expanded RET as an emission reduction policy. The arguments for compensation under the CPRS are linked to

carbon leakage. The same consideration should apply here to determine if compensation for higher electricity prices attributable to the expanded RET would be appropriate.

Are the exemption arrangements economically efficient?

The proposed arrangements will recover the shortfall that results from REC exemptions for some energy users, from the remaining electricity consumers. As a broad generalisation, electricity consumption by small energy users is likely to be less sensitive to price increases as consumption by large energy users. On this basis, it would be economically efficient for smaller energy users to bear a larger proportion of the REC burden than larger end users. Assuming the exempt electricity supply is around 30 % of total electricity supplied in Australia, this means that by 2020, RECs will need to be surrendered for roughly 33% of the electricity supplied to remaining electricity users that have no REC exemption. By comparison, RECs are currently surrendered for around 2.6% of electricity supplied. In other words, the proposed REC exemption arrangements increase the REC burden for non-exempt energy users by a factor of around 12. This is obviously a very significant increase, although the impact on final electricity prices will depend on the price of RECs.