Australian Government
Climate Change Authority

RENEWABLE ENERGY TARGET REVIEW

Discussion Paper

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DISCUSSION PAPER

This discussion paper sets out the Climate Change Authority's draft recommendations on the Renewable Energy Target review. The draft recommendations have been developed having regard to the Authority's charter, stakeholder views and modelling work commissioned by the Authority. They reflect the Authority's preliminary views on key issues and may change ahead of the final report following further consultation with, and feedback from, interested parties.

Key dates

Issues paper	›	Submissions received	›	**Discussion paper**	›	Consultation and feedback	›	Final report
August 2012		September 2012		**October 2012**		November 2012		December 2012

Feedback and enquiries

The Climate Change Authority welcomes feedback on the discussion paper from interested parties by 14 November 2012. We are particularly interested in feedback on specific draft recommendations. Please note that this is not an additional formal submissions process. A submissions process was conducted in August and September 2012, and submissions are available on our web site at www.climatechangeauthority.gov.au/submissions/received.

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IMPORTANT: The Climate Change Authority may publish your feedback on its website or cite your feedback in future reports. If you do not wish your feedback to be made public, please indicate this by marking your correspondence 'confidential'.

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OVERVIEW

This discussion paper sets out the preliminary views of the Climate Change Authority regarding its first review of the Renewable Energy Target.

This discussion paper sets out the preliminary views of the Climate Change Authority (the Authority) in relation to its statutory review of the Renewable Energy Target (RET).

The Authority was established on 1 July 2012 as an independent advisory body on climate change. The Authority will conduct climate change research, as well as periodic statutory reviews on a range of climate change matters.

The first review of the Authority is of the Renewable Energy (Electricity) Act 2000 (Cth) (REE Act) and is due by 31 December 2012.

The RET was first established in 2000 as the Mandatory Renewable Energy Target (MRET), with the objective of encouraging additional investment in renewable energy generation and reducing emissions of greenhouse gases in the electricity sector. There has been a series of amendments (some substantial) to the scheme over time.

The RET creates demand for additional renewable energy generation by placing a legal obligation on entities that purchase wholesale electricity to surrender a certain number of renewable energy certificates each year. The RET operates as two schemes – the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES).

In forming its views, the Authority has considered the views of participants…

In preparing this discussion paper, the Authority has drawn upon submissions to the issues paper, consultations with industry, community groups, and governments at national, state, and territory level, as well as its own analysis.

… and is conscious that the RET is an established scheme, which has operated for many years.

In progressing the review, the Authority appreciates that it is not faced with a blank canvas: the RET has operated for many years, companies have already made significant investments on the basis of the legislation and are planning on investing substantially more. The Authority is also aware that the RET is not a 'least cost' way of reducing greenhouse gas emissions, and that the costs of the RET are borne by electricity consumers, who are already facing large increases in electricity prices for other reasons.

However, the introduction of the carbon pricing mechanism has significantly changed the policy landscape.

Domestically, the policy landscape has changed significantly since the MRET was first legislated. Most importantly, the carbon pricing mechanism is now in place, and is intended to be the main instrument by which Australia achieves its greenhouse gas emissions reduction targets. In addition, the Government has established the Australian Renewable Energy Agency and the Clean Energy Finance Corporation (CEFC). These organisations will also support the future development of renewable energy generation.

It is not the focus of this review to consider whether or not the RET should exist. Rather given that it does exist, the focus is on improvements that can be made to the RET within this new policy environment.

A key challenge of this review is to find the appropriate balance between promoting policy certainty against the scheme costs to society in general, and to electricity users specifically.

The Authority will continue its deliberations ahead of releasing a final report in December.

This discussion paper includes a number of draft recommendations which reflect the Authority's preliminary views on how the RET can be improved. The Authority will draw on stakeholder feedback from review participants when formulating its final recommendations and report, which are due by 31 December 2012.

The Authority's draft recommendations have the following broad objectives:

- increasing confidence and predictability;
- providing flexibility and choice;
- managing overall costs and delivering equity; and
- streamlining administration and compliance costs.

Increasing confidence and predictability

Policy stability is important for investment.

The Authority considers that policy stability and predictability are important elements in encouraging new investment at a reasonable cost. This is relevant to achieving any particular target under the RET, but also more broadly in terms of Australia's ongoing adjustment to a more carbon constrained future. The Australian electricity market is already facing considerable uncertainty, particularly in relation to the future of the carbon price. The Authority is concerned that adding to these uncertainties by recommending major changes to current policy settings at this time could increase risk premiums required by lenders and investors in renewable energy, and may affect perceptions of risk for investors in clean technologies more broadly.

The level and form of the Large-scale Renewable Energy Target

The Authority proposes a number of draft recommendations that are designed to promote confidence and predictability. The most important of these relate to the form and level of the LRET target.

Currently, the RET comprises the LRET with a fixed legislated target of 41 000 gigawatt hours (GWh) per annum for the period 2020 to 2030, and an 'uncapped' SRES with no quantitative limit.

There were a wide range of views regarding the appropriate form and level of the large-scale target.

Most of the submissions received by the Authority commented on the level of the target, and views expressed generally fell into one of four camps:

- leaving the existing target unchanged at 41 000 GWh, which was the predominant view of renewable energy companies and their representative organisations, as well as the Ai Group, Professor Garnaut and one of Australia's three largest retailers (AGL);
- reducing the gigawatt hour target to align with an updated version of 20 per cent of projected electricity supply (either on a rolling or a once-off basis), which was the predominant view among coal-fired generators, a number of business groups including the Business Council of Australia and the Australian Industry Greenhouse Network and the other two largest retailers (Origin Energy and TRUenergy (now known as Energy Australia));
- increasing the target, particularly in light of the creation of the CEFC, which was supported by a number of environmental organisations, including the Australian Conservation Foundation, the World Wildlife Fund, the Australian Youth Climate Coalition and private individuals; and
- repealing the RET altogether, which was supported by the National Farmers' Federation, the NSW Independent Pricing and Regulatory Tribunal, the Australian Coal Association, and the Minerals Council of Australia.

The existing target should be retained.

The Authority's preliminary view is that the existing LRET target should not be changed, and that the benefits of any change at this time (either an increase or decrease) would be outweighed by the costs of increased regulatory uncertainty.

The case for increasing the post-2020 target would be considered in the 2016 RET review.

Regarding proposals to increase the target, the Authority considers this is unnecessary in the context of a sufficient carbon price. With regard to CEFC, it is difficult to predict the impact of CEFC investment on the RET before the CEFC's investment mandate has been set. The CEFC is aware of the potential overlap and has stated it will 'look to viable opportunities that enhance the deployment of renewable energy but do not directly impact on the RET' (CEFC Expert Review 2012, p.22). The Authority recognises that the CEFC is intended to complement the RET, and not to simply fund projects that would have gone ahead in any event. As the Authority finalises the RET review, it will continue to consult with the Chair of the CEFC. The Authority noted the view of the Clean Energy Council – one of the peak industry bodies for the clean energy sector – that any change in the target, including an increase, could delay investment and jeopardise the efficient achievement of the target. It is proposed that the Authority consider the case for adjusting the post-2020 target in its 2016 RET review.

In relation to proposals to reduce the target, the Authority is aware that the most recent projections of future electricity demand are substantially lower than previous forecasts, and that the net effect is that the RET is likely to account for more than 20 per cent of total energy supply. (The Authority estimates that total renewable energy generation may account for around 25 per cent of electricity supply in 2020.)

The Authority's preliminary view is that the existing target of 41 000 GWh should not be reduced in line with projected lower electricity demand.

Decreasing the target to an 'updated' 20 per cent target of 26 400 GWh is estimated to save around $4.4 billion in resource costs and would have no significant impact on average household bills.

Modelling commissioned by the Authority for this review estimates that reducing the LRET target to an 'updated' 20 per cent target of 26 400 GWh would save around $4.4 billion in resource costs (savings in annualised capital and operating costs between now and 2030), out of a total resource cost in the generation sector of around $116 billion over the period. These figures assume no change in the costs of capital associated with any increase in risk premiums required by investors as a result of perceptions of increased regulatory risk, which would reduce this estimated cost saving. The modelling also estimates that reducing the LRET target to an 'updated' 20 per cent target would lead to an additional 94 megatonnes of greenhouse gas emissions being generated by the electricity sector between now and 2030.

The benefits of changing the target do not outweigh the costs of increased regulatory uncertainty.

The Authority considers that the projected resource cost savings to society overall that might be achieved by reducing the target would not be large enough to offset the damage to investor confidence that such a change could entail.

In terms of the impacts on electricity prices paid by energy users, taking into account both the cost of certificates and the decrease in wholesale electricity prices, modelling to date suggests that the difference between the scenarios is likely to be small, and the net present value of the impact on average household bills between now and 2030 would not be significant.

Several of the submissions arguing for a reduction of the target also argued for a change in its form – to either a floating percentage-based target, or retaining a gigawatt hour target for each year, but not setting their exact levels until closer to the time.

The target should remain fixed in terms of gigawatt hours to provide certainty to investors.

The Authority's present view is that the form of the target should remain fixed in terms of gigawatt hours. It considers that a one-off change to the level of the target risks damage to the investment environment, and that a target expressed as a percentage, or one in gigawatt hours that was adjusted through time would be even more damaging. The Authority is therefore inclined to support the conclusions of the 2003 Tambling Review of the MRET, which stated:

The Review Panel [is] convinced … that any future target should continue to be expressed in terms of a fixed GWh level. By their nature, projections of electricity demand contain a degree of uncertainty… Risk is a key factor in investment decision making, so that any changes to MRET that would reduce market certainty would also reduce the prospect of attracting the required financial backing for projects. The Review Panel considers that a fixed target is more compatible with market certainty, with MRET's industry development objective, which defines a level of renewable energy generation rather than a percentage of a fluctuating electricity market over which the industry has no control (MRET Review Panel, 2003, p.119-120).

The ongoing existence of the Small-scale Renewable Energy Scheme

The SRES should remain separate from the LRET…

The second major area where the Authority considers broad maintenance of the status quo is preferable to further change is in relation to the separate existence of the SRES. The Authority's preliminary view is that the SRES should remain a separate scheme, and its broad structure should remain largely unchanged. This will provide confidence and predictability for small-scale installers, as well as small businesses, households and community groups participating in the scheme.

… as the small decrease in cost is outweighed by costs of the associated increase in regulatory uncertainty.

The Authority examined the possibility of remerging the SRES and the LRET into one scheme. The primary benefit of such merging is a likely reduction in costs because it would cap SRES generation, likely leading to less overall renewable energy generation in 2020. The main disadvantage is the potential for increased regulatory uncertainty and the associated investment risks. Given the estimated costs of maintaining the two schemes is not significantly more expensive than a single combined scheme, the Authority's view is that the two schemes should remain separate.

The SRES should remain 'uncapped' …

It is also the Authority's preliminary view that the SRES should continue to operate without a long-term gigawatt hour target, and that the price cap (set by the clearing house price) should remain at $40.

… and the clearing house price should remain at $40…

One area where the Authority considers a change is worth pursuing is in respect of the rules for entering certificates on the clearing house transfer list. The Authority received a number of submissions from householders who had put their certificates on the transfer list and had assumed that putting their certificates into the clearing house would deliver them $40 per certificate in a timely manner. In practice, certificates have remained on the clearing house transfer list for considerable periods of time, with certificates trading in the secondary market for around $20-$30.

… but the clearing house should be amended to a 'deficit sales facility' to make it clear that it cannot guarantee a set price of $40 per certificate.

To provide clarity to scheme participants, the Authority's preliminary view is that the clearing house should be amended to a 'deficit sales facility', whereby certificates are only allowed to be entered on the clearing house transfer list when the clearing house is in deficit (that is, only when regulator-created certificates have been issued to liable entities). This would allow the continued operation of the clearing house as a price cap, while making it clear that it is unable to guarantee a set price for certificates. Such an amendment would also allow the clearing house price to be more easily amended as there would be no need for transitional arrangements for certificates on the transfer list.

The Authority makes draft recommendations in relation to some other aspects of the SRES, which are discussed in the context of managing overall costs below.

Frequency and scope of future reviews

The third key area where the Authority makes draft recommendations in order to promote greater confidence and predictability is in relation to the frequency and scope of future scheme reviews. Currently the *REE Act* requires reviews of the scheme to occur every two years. The vast bulk of submissions that commented on this issue – regardless of their position on the RET overall – argued that two-yearly reviews were undesirable.

The Authority should review the RET every four years to promote greater regulatory certainty.

On balance, the Authority's preliminary view is that the frequency of scheduled scheme reviews should be amended from every two years to every four years. This approach would see the next review of the RET take place in 2016.

The Authority is not proposing any change to the scope of future reviews. This approach is considered to represent a reasonable balance between maintaining flexibility to adjust the policy as circumstances change and investor certainty.

Providing flexibility and choice

The Authority makes a number of draft recommendations intended to promote greater flexibility and choice in areas where the existing constraints appear to impose unnecessary costs.

Making partial exemption certificates tradable

Partial exemption certificates should be made 'tradeable'…

In relation to increasing flexibility and choice, the Authority suggests that the partial exemption certificates that are provided to emissions-intensive, trade-exposed industries should be tradable – that is, firms should be able to sell them to any liable party, not just their own electricity supplier. Currently, businesses carrying out eligible activities can apply annually for partial exemption certificates; they are provided as a form of assistance to reduce the cost impact of the RET.

…to make it more likely that emissions-intensive, trade-exposed businesses will receive a market value for them.

Partial exemption certificates are provided for the benefit of the recipients, not electricity suppliers: making them tradable increases the likelihood that the recipient would receive a market value for them to offset actual scheme costs as intended by the policy.

Introduce an 'opt-in' option for large energy users

Opt-in liability arrangements will allow large energy users to better manage their own compliance costs…

A second area where the Authority's preliminary view is that greater flexibility and choice could be provided is in relation to an 'opt-in' facility for large electricity consumers. Currently, large electricity users are not able to opt-in to manage their own liability under the RET. Opt-in arrangements for large energy users have been used in other certificate-based trading schemes, including the carbon pricing mechanism and the New South Wales Greenhouse Gas Reduction Scheme. Several submissions supported an opt-in facility on the basis that it would provide large energy users greater scope to manage their own compliance costs, rather than having them passed on by their electricity supplier.

… but must be designed to minimise additional administrative costs.

The Authority considers that allowing large electricity users to manage their own liabilities (if they choose) would improve flexibility and choice. The Authority is continuing to consider an appropriate threshold for eligibility to opt-in, to strike an appropriate balance between promoting flexibility and avoiding unreasonable administrative costs.

Allow multiple bodies to accredit installers

The final area where the Authority suggests greater flexibility and choice could be created is in relation to the accreditation of small-scale technology installers. Currently, the Clean Energy Council is the only organisation that can accredit small generation unit installers for the purposes of creating certificates in the SRES.

Additional accreditation bodies may increase services and reduce costs to the small-scale industry…

More accreditation bodies may provide greater opportunity for installers and products to become certified. Allowing other interested parties to accredit installers could result in increased services to the industry and/or reduced costs for participants.

… but must be appropriately managed to ensure high standards are maintained.

On balance, the Authority's preliminary view is that the legislation should be amended to allow additional accreditation bodies. It would be important that any changes to the accreditation arrangements did not result in lower standards. To ensure that accreditation bodies are of an appropriate standard, provision should be made for the Clean Energy Regulator to approve and revoke an accreditation body's participation in the small-scale scheme with reference to an appropriate set of criteria.

The Authority also notes that solar photovoltaic (PV) and solar water heaters require accredited components, but small wind and hydro systems do not. While these technologies make up a small percentage of total installations, the Authority's preliminary view is that small wind and hydro installations should also meet a minimum standard of safety and performance. Better standards required of these products might also enhance community confidence for these industries in the future.

Managing overall costs and equitable distribution

The costs of the RET are borne by electricity consumers who are already facing increasing electricity prices for other reasons. They are also borne by fossil fuel generators through lower wholesale prices and reduced market share. Furthermore, while low income households spend the least amount of money on domestic fuel and power costs, compared with other households, these costs make up a larger proportion of low income household total expenditure.

The Authority is, therefore, interested in examining changes to the RET that could lower overall costs and ensure they are equitably distributed.

Options for cost-containment in the Small-scale Renewable Energy Scheme

The 'uncapped' nature of the SRES means its costs are also uncapped.

The design of the SRES makes cost-containment more challenging than in the LRET because the scheme has no quantitative cap. This means it is less likely that the market price of certificates will automatically fall in the face of falling technology costs or rising electricity prices.

This has been exacerbated by the greater than expected uptake of small-scale systems.

In recent times, SRES costs have constituted an unexpectedly high proportion of retail electricity prices. As pointed out in a number of submissions, however, key factors driving this have either now ceased (generous feed-in tariffs at the state and territory level) or are being phased out (the current 'multiplier' applying to small generation unit certificates, which currently gives two certificates for every deemed megawatt hour to be produced by that system, is due to end on 1 July 2013). The Clean Energy Council argues that the peak in SRES costs has passed, and that SRES costs are likely to be lower in future.

A mechanism to constrain the costs of the SRES will ensure they remain appropriate and provide predictability to business.

The Authority is considering methods that could potentially be used to constrain the costs of the SRES in the future for two main reasons:

- from an energy user's perspective, confidence that SRES costs will not get 'out of hand' in future would be desirable; and
- from the point of view of renewable energy businesses operating in the SRES, greater clarity about what might trigger a change in the arrangements, and how the Government might respond, would provide a more predictable business environment.

The legislation already contains a power allowing the Minister to lower the clearing house price under certain circumstances. This power was included as a potential cost-control measure (Commonwealth, House of Representatives 2010).

'Discounting' of certificates (the use of multipliers of less than one) will be the most effective and fair way of containing the future costs of the SRES.

The Authority's preliminary view is that the preferred method of constraining costs, if the need arises, is through further reductions to the multiplier (that is, to less than one), rather than through changes to the clearing house price. On balance, the Authority considers that reducing the multiplier avoids transitional issues that would arise in changing the clearing house price, and may also be more effective (given the clearing house price is only a price cap, and actual prices may be significantly below that price). A reduction in the price cap could be considered if necessary when there is some experience of the scheme's operation in the absence of the multiplier and high feed-in tariffs.

Reduction in the discount factor should be exercised in a predictable and transparent way.

In relation to the circumstances in which the Minister should reduce the multiplier, the Authority is still considering which 'triggers' would be most meaningful and transparent. The Authority's preliminary view is that factors such as electricity prices and the contribution of the SRES to them, changes in net system costs, and payback periods for small-scale systems are the most prospective.

No new displacement technologies

Displacement technologies are better suited to an energy efficiency 'white certificate scheme' than the RET.

One of the objectives of the RET is to encourage additional renewable energy generation. In principle, technologies that displace energy, rather than generate it, do not further this objective and, while important, do not belong in the RET. Displacement technologies would be better suited to an energy efficiency 'white certificate scheme' (a certificate trading scheme where the certificates relate to an amount of energy saved).

The SRES already includes two 'displacement' technologies – solar water heaters and heat pumps. Given these anomalies already exist in the scheme, it is more difficult to argue that no new displacement technologies should be added – each has potentially the same impact on greenhouse gas emissions, for example. This issue highlights the difficulties inherent in technology-specific measures rather than broad-based measures like a carbon price – technology-specific schemes require that boundaries be drawn around eligibility.

No new displacement technologies should be admitted…

Given the RET's focus on generation, the Authority's preliminary view is that no new displacement technologies should be added to the RET.

… but existing displacement technologies should remain eligible until a national white certificate scheme is implemented.

The Authority considers that existing displacement technologies should remain eligible, at least for the time being. However, in the event that a national white certificate scheme were ever implemented, all displacement technologies should cease to be eligible under the RET, and should transfer to the white certificate scheme. The ongoing eligibility of solar water heaters should be reviewed in light of regulatory developments – to the extent that solar water heaters are mandated through other means it would be difficult to justify their continued support through the RET.

Shortfall Charge

The Authority does not recommend any change to the shortfall charge at this time. However, the Authority notes that in the event that the carbon price or electricity demand are significantly lower than currently estimated there is a risk that the target would not be met with the current shortfall charge. The Authority will consider the level of the shortfall charge in its 2016 review or earlier if circumstances warrant it.

Streamlining administration and compliance costs

The Authority is committed to pursuing options to streamline the RET scheme's administration and compliance costs. This could lead to lower business costs and encourage participation in the scheme.

Greater alignment between arrangements for emissions-intensive, trade-exposed industry under the RET and the carbon pricing mechanism

The level of assistance for emissions-intensive, trade-exposed businesses should be reviewed by the Productivity Commission in its 2014-15 review of the Jobs and Competitiveness Program

The partial exemption framework for emissions-intensive, trade-exposed industries has the same rationale and data inputs as the Jobs and Competitiveness Program under the carbon pricing mechanism. The Productivity Commission is due to review the level of assistance provided under the Jobs and Competitiveness Program in 2014-15. Given the similarities between the partial exemption framework under the RET and the Jobs and Competitiveness Program, it is the preliminary view of the Authority that they should be reviewed together by the Productivity Commission in 2014-15.

There is scope to streamline administrative requirements for the partial exemption framework and the Jobs and Competitiveness Program.

The first area where the Authority suggests that greater administrative streamlining could occur is in relation to the partial exemption framework under the RET. This framework is similar to, but not the same as, the Jobs and Competitiveness Program under the carbon pricing mechanism. There appears to be scope for greater streamlining of the processes for gathering information and for audits under the two arrangements.

Regulator to stop collecting data on out-of-pocket expenses for small generation unit installations

The third area where compliance and administrative costs could be reduced relates to the collection of information on out-of-pocket expenses for small generation units. Currently, the Minister has to consider the amount of out-of-pocket expenses that system owners contribute when reducing the clearing house price. The Clean Energy Regulator currently collects information on out-of-pocket expenses.

Current arrangements to collect information on out-of-pocket expenses are unlikely to be effective…

Information on what customers are actually paying for small-scale systems is likely to be useful. It is questionable, however, whether the current arrangements create either an accurate data source or a cost-effective one. (Incentives for truthful reporting of low out-of-pocket expenses are poor if the consequence may be a lowering of the clearing house price – especially since the Regulator has limited ability to reasonably verify the information in any individual case.)

… and should be removed. The Clean Energy Regulator should instead commission surveys to gather information on out-of-pocket expenses.

The Authority's preliminary view is that the requirement to provide data on the out-of-pocket expense for a small generation unit installation should be removed from the REE Act, reducing overall administration and compliance costs. The Regulator should continue to gather information on out-of-pocket expenses, but should do so via other means (such as commissioning surveys on their behalf).

Next steps

The Authority will continue to consider its position as it finalises the RET review…

The Authority will continue to consider its position on aspects of the review as it finalises its review process. Feedback on the preliminary views set out in this discussion paper will be sought through a series of iterations that the Authority will hold in early November 2012. While formal submissions are not sought, interested parties are welcome to provide written feedback on this discussion paper. Information on this process is included at the beginning of this paper.

…which will be presented to the Minister and published on the Authority's website in December.

The final report will be presented to the Minister and published on the Authority's website in December 2012. It is required to be tabled in the Commonwealth Parliament within 15 sitting days of the Minister receiving it.

DRAFT RECOMMENDATIONS

The full list of draft recommendations is below.

Chapter 3 – Role of the Renewable Energy Target

1. The preliminary view of the Authority is that the frequency of scheduled scheme reviews be amended from every two years to every four years, so that the next review would be in 2016.

Chapter 4 – The Large-scale Renewable Energy Target

2. The preliminary view of the Authority is that the form of the target should continue to be expressed in legislation in terms of a fixed gigawatt hour level.
3. The preliminary view of the Authority is that the existing large-scale renewable target of 41 000 GWh and interim targets should be maintained in their current form.
4. The preliminary view of the Authority is that the Renewable Energy Target Review in 2016 is an appropriate time to consider adjusting the targets beyond 2020 in light of the policy and economic conditions prevailing at that time.

Chapter 5 – Small-scale Renewable Energy Scheme

5. The preliminary view of the Authority is that the Small-scale Renewable Energy Scheme should remain separate to the Large-scale Renewable Energy Target.
6. The Authority is continuing to consider whether the threshold for a small-scale solar PV system should be reduced below its current 100 kW limit to for example 10 kW.
7. The preliminary view of the Authority is that the price cap remain fixed at $40, to be reassessed once there is some experience of the scheme's operation in the absence of the multiplier.
8. The preliminary view of the Authority is that discounting (multipliers of less than one) of the number of certificates to be created in respect of each megawatt hour be provided to allow the Minister to control the cost of the SRES and ensure the subsidy level is appropriate.
9. The preliminary view of the Authority is that a decision to apply or lower a discount factor should be applied in the following manner:

   – The Minister should consider whether to lower the discount factor at the time the small-scale technology percentage is set each year.

   – The Minister's decision should be based on, and proportional to, the following criteria: (i) any reduction in net system costs over the last year; (ii) electricity prices and whether the SRES contribution is greater than 1.5 per cent; and (iii) whether the average payback period of a small-scale system has fallen below ten years.

   – In making the decision, the Minister must obtain and take into consideration independent data surveys regarding the above criteria. The survey results should be published.

   If the Minister decides to lower the discount factor, the Minister should provide reasons regarding the weighting of each element.

10. The preliminary view of the Authority is that the clearing house should be amended to a 'deficit sales facility' whereby new certificates may only be placed on the transfer list when the clearing house is in deficit.

Chapter 6 – Liability and exemption framework

11. The preliminary view of the Authority is that there should be no changes to the primary point of liability or the size threshold for coverage of grids.
12. The preliminary view of the Authority is that large electricity consumers should be able to opt in to assume direct liability for Renewable Energy Target obligations. The Authority will consult further with participants and the Clean Energy Regulator on a workable model for opt-in arrangements.
13. The preliminary view of the Authority is that no changes be made regarding the process for calculating individual liability.
14. The preliminary view of the Authority is that the renewable power percentage and small-scale technology percentage should be required to be set prior to a compliance year, and preferably by 1 December of the preceding year.
15. The preliminary view of the Authority is that the current arrangements for surrender of certificates (annual surrender for the Large-scale Renewable Energy Target; quarterly surrender for the Small-scale Renewable Energy Scheme) should be maintained.
16. The preliminary view of the Authority is that the current settings for the shortfall charges should be maintained. However, the level of the shortfall charge should be reconsidered by the Authority as part of its 2016 review of RET targets beyond 2020, or earlier if circumstances warrant it.
17. The preliminary view of the Authority is that the level of the emissions-intensive, trade-exposed exemption under the Renewable Energy Target should be considered by the Productivity Commission as part of its broader review of the carbon pricing mechanism Jobs and Competitiveness Program in 2014-15.
18. The preliminary view of the Authority is that Partial Exemption Certificates should be tradeable and made usable by any liable entity to reduce liable electricity acquisitions.
19. The preliminary view of the Authority is that the Commonwealth Government should consider opportunities to align application processes and data requirements for the Jobs and Competitiveness Program and Renewable Energy Target as closely as possible.
20. The preliminary view of the Authority is that there is no strong case for the exemption from liability under the Renewable Energy Target for self-generation, and that the exemption should be removed for new self-generation (but retained for existing self-generators).

Chapter 7 – Eligibility of renewable energy under the Renewable Energy Target

21. The preliminary view of the Authority is that no change is necessary to the accreditation process for LRET.
22. The preliminary view of the Authority is that existing arrangements for waste coal mine gas should be maintained.
23. The preliminary view of the Authority is that there should be no change to the *REE Act* to allow for new waste coal mine gas to be eligible.

24. The preliminary view of the Authority is that without a clear process for ensuring that inclusion of wood waste from native forests would be ecologically sustainable that it should not be reintroduced to the RET.
25. The preliminary view of the Authority is that new small scale technologies should be considered on a case by case basis for inclusion in the SRES.
26. The Authority notes that at this time there are no additional new small scale technologies that should be made eligible in the SRES.
27. The preliminary view of the Authority is that existing arrangements for displacement technologies should be maintained.
28. The preliminary view of the Authority is that no change should be made to the *REE Act* to allow additional displacement technologies.

Chapter 8 – Diversity of renewable energy under the Renewable Energy Target

29. The preliminary view of the Authority is that no change should be made to the Renewable Energy Target framework to promote diversity.

Chapter 9 – Small-scale scheme administrative issues

30. The preliminary view of the Authority is that the small-scale accreditation system should be open to accreditation bodies other than the Clean Energy Council. Provision should be made for the Clean Energy Regulator to develop to develop a regime to approve accreditation bodies.
31. The preliminary view of the Authority is that wind and hydro products should require accreditation to be eligible to create certificates.
32. The preliminary view of the Authority is that the existing deeming arrangements remain appropriate.
33. The Authority is continuing to consider whether, in conjunction with any reduction in the threshold for a small-scale solar photovoltaic system below 100 kilowatts, any shortening of the deeming period for larger sized units would be appropriate.
34. The preliminary view of the Authority is that the requirement to submit a solar water heater and small generation unit return should be removed from the *Renewable Energy (Electricity) Act 2000* (Cth).
35. The preliminary view of the Authority is that the requirement to provide the out-of-pocket expense data for a small generation unit installation should be removed from the *Renewable Energy (Electricity) Act 2000* (Cth).

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CHAPTER 1. INTRODUCTION AND HISTORY OF THE RENEWABLE ENERGY TARGET

This chapter introduces the Renewable Energy Target (RET) review and explains the purpose and structure of this discussion paper. It includes a brief summary of the major developments in the evolution of the RET in Australia.

The Authority is required by legislation to undertake a review of the RET. The RET is a certificate-based scheme designed to increase renewable energy generation in Australia. From its announcement in 1997, the RET has evolved from a 9 500 gigawatt hour (GWh) target for 2010, to a 45 000 GWh target for 2020. It has been one of the longest-standing greenhouse gas emissions reduction policies in Australia and has been critical to the deployment of large-scale and small-scale renewable energy.

While the current RET retains many of its original design features, amendments have been made to the size of the target, structure of the RET and liability exemptions since it was first legislated in 2000.

1.1. The Climate Change Authority

The Climate Change Authority was established on 1 July 2012 as an independent advisory body on climate change. The Authority is to conduct climate change research, as well as periodic reviews on a range of climate change matters, including carbon pollution caps, progress towards meeting national emissions reduction targets, the carbon pricing mechanism, the RET and the Carbon Farming Initiative.

The Authority's constitution, functions and guiding principles are set out in the *Climate Change Authority Act 2011* (Cth). This Act states that in conducting a review the Authority must have regard to the principle that any measure to respond to climate change should:

- be economically efficient;
- be environmentally effective;
- be equitable;
- be in the public interest;
- take account of the impact on households, businesses, workers and communities;
- support the development of an effective global response to climate change;
- be consistent with Australia's foreign policy and trade objectives; and
- any additional principles the Authority considers relevant.

The Authority is also required to conduct public consultation for all its reviews, including this review of the RET.

1.2. An overview of the Renewable Energy Target

The Commonwealth Government is committed to ensuring 'the equivalent of at least 20 per cent of Australia's electricity generation comes from renewable resources by 2020'.[1] This commitment is being pursued through the RET scheme (see Box 1).

Box 1 Summary of the Renewable Energy Target legislation

- *Renewable Energy (Electricity) Act 2000* (Cth)
  Establishes the large-scale and small-scale schemes, including: the liability framework, certificate generation and administrative arrangements.
- *Renewable Energy (Electricity) (Small-scale Technology Shortfall Charge) Act 2010* (Cth)
  Imposes the small-scale technology shortfall charge at a rate of $65 per megawatt hour.
- *Renewable Energy (Electricity) (Large-scale Generation Shortfall Charge) Act 2000* (Cth)
  Imposes the large-scale generation shortfall charge at a rate of $65 per megawatt hour.
- *Renewable Energy (Electricity) Regulations 2001* (Cth)
  Sets out further detail regarding the operation and administration of the large-scale and small-scale schemes.

The RET scheme creates demand for additional renewable energy by placing a legal obligation on entities that purchase wholesale electricity (mainly electricity retailers) to surrender a certain number of renewable energy certificates to the Clean Energy Regulator each year. Each certificate represents one megawatt hour (MWh) of additional renewable energy for compliance purposes (there is currently an exception in the case of the Solar Credits multiplier, which has the effect that each small-scale technology certificate does not necessarily equal one megawatt hour of generation). Certificates are generated by accredited renewable energy power stations (e.g. wind-powered generators) and eligible small-scale renewable technology systems (e.g. solar photovoltaics (PV)). The sale of certificates supports additional renewable energy deployment. Certificates are tradeable and may be banked. Banking means that certificates issued in one year may be surrendered to meet an obligation in a later year.

Since 1 January 2011, the RET has operated as two schemes – the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). The LRET supports large-scale renewable energy projects, such as wind-powered generators and commercial solar, by helping to bridge the cost between renewable and fossil-fuelled generation. The SRES assists households, small businesses and community groups with the upfront cost of installing small-scale renewable technology systems. The reason for the separation of the scheme into two separate mechanisms is described later in this chapter.

The RET scheme is administered by the Clean Energy Regulator (formerly the Office of the Renewable Energy Regulator). The Clean Energy Regulator is an independent statutory authority established by the *Clean Energy Regulator Act 2011* (Cth). The Clean Energy Regulator's main functions in relation to the RET include maintaining the Registry, issuing certificates, managing the surrender of certificates, administering the liability provisions and enforcing compliance with the scheme.

[1] Explanatory Memorandum, *Renewable Energy (Electricity) Bill 2010* (Cth) p.2. Note the 'equivalent' language is designed to capture displacement technologies – such as solar water heaters and heat pumps, which are included in the RET scheme but do not generate electricity.

Certificate creation, trade and surrender are managed through the Renewable Energy Certificate Registry. The Registry is an internet-based registry system that:

- facilitates the creation, registration, transfer and surrender of certificates;
- tracks the ownership of certificates;
- provides access to the small-scale technology certificate clearing house; and
- maintains the public registers required by the *Renewable Energy (Electricity) Act 2000* (Cth) *(REE Act)*.

1.3. The Renewable Energy Target review

1.3.1. Legislative requirements and scope of the review

The first review by the Authority is of the *REE Act* and is due by 31 December 2012. The review is required under the *REE Act* (see Box 2).

The legislative provisions covering the review are broad. The Authority has interpreted the scope of its review as covering:

- the role of the RET and its relationship to other policy measures;
- the LRET, including the target trajectory, the target level and its relationship to the Clean Energy Finance Corporation;
- the SRES, including its design and architecture;
- the liability and exemptions framework, and shortfall charge of both the large-scale and small-scale schemes;
- the eligibility framework for both schemes and the diversity of renewable energy; and
- the frequency and scope of future reviews under the *REE Act*.

There is a range of other policy issues that also affect the climate for renewable energy investment. The Authority will take these matters into account as part of the context for its review, but does not intend to make recommendations on:

- other government policies, such as the carbon pricing mechanism, planning regulations, energy efficiency schemes and feed-in tariffs;
- the investment mandate and design of the Clean Energy Finance Corporation; and
- rules and regulations regarding electricity markets, including network connection arrangements.

The Minister for Climate Change and Energy Efficiency wrote to the Chair of the Authority on 13 July 2012 in respect of the RET review. This letter provides background relevant to the RET review. It also notes that the Council of Australian Governments is prioritising a review of climate programs to consider whether they are complementary to a carbon price. The letter notes that the Authority's report of the RET review will be used as an input to the Council's work, and is reproduced at Appendix A.

The Authority must provide a report of the RET review to the Minister by 31 December 2012 and publish the report on its website as soon as practicable thereafter. The Minister must table the report in Parliament within 15 sitting days of receiving it and respond to any recommendations within six months.

Box 2 The legislative foundations of the Renewable Energy Target review

Section 162 of the REE Act mandates reviews every two years and defines the scope of these reviews:

162 (1) The Climate Change Authority must conduct reviews of the following:

a) the operation of this Act and the scheme constituted by this Act;

b) the operation of the regulations;

c) the operation of the Renewable Energy (Electricity) (Large-scale Generation Shortfall Charge) Act 2000 (Cth);

d) the operation of the Renewable Energy (Electricity) (Small-scale Technology Shortfall Charge) Act 2010 (Cth); and

e) the diversity of renewable energy access to the scheme constituted by this Act, to be considered with reference to a cost benefit analysis of the environmental and economic impact of that access.

Section 162(11) of the Act states that 'a recommendation may not be inconsistent with the objects of the Act'. The objects of the Act are set out in section 3 as:

- to encourage the additional generation of electricity from renewable sources;
- to reduce emissions of greenhouse gases in the electricity sector; and
- to ensure the renewable energy sources are ecologically sustainable.

1.3.2. Process

Throughout the RET review, the Authority will consult with interested parties. To assist this process, the Authority released an issues paper on 20 August 2012. The issues paper explained the scheme and requested feedback from stakeholders on particular questions. Almost 8 700 submissions were received, including two submission campaigns organised by GetUp (over 7 700 submissions) and Hepburn Wind (over 700 submissions). Submissions, including samples from the submission campaigns, are available on the Authority's website at http://climatechangeauthority.gov.au/submissions/received.

The Authority will continue to consider its recommendations ahead of the final report. Feedback on the preliminary positions set out in this discussion paper will be sought through targeted stakeholder consultation and any written feedback received by the Authority in November 2012.

The review timeline is:

1 July 2012	Authority established
20 August 2012	Issues paper released
14 September 2012	Issues paper submissions due date
26 October 2012	Discussion paper released
Early November	Roundtable discussion with invited parties
December 2012	Final report released

1.3.3. Discussion paper

This discussion paper sets out the Authority's draft recommendations on the RET. The draft recommendations have been developed with regard to analysis based on the Authority's principles, stakeholder views and modelling work commissioned by the Authority. The draft recommendations reflect the Authority's preliminary views on key issues and may change ahead of the final report following further consultation with stakeholders.

The discussion paper covers:

- the history of the RET (Chapter 1);
- the performance of the RET to date against its objectives, including the impact on electricity generation, changes in greenhouse gas emissions and other impacts of the RET policy (Chapter 2);
- the role of the RET in the current policy context, taking into account the introduction of the carbon pricing mechanism and the establishment of the Australian Renewable Energy Agency and the Clean Energy Finance Corporation. It also comments on the frequency of RET reviews conducted by the Authority (Chapter 3);
- the form and level of the LRET target (Chapter 4);
- the architecture of the SRES, including whether it should be merged with the LRET, potential cost containment mechanisms and the future role of the clearing house (Chapter 5);
- the liability framework for the RET (Chapter 6);
- the eligibility framework of both the LRET and the SRES, including the treatment of waste coal mine gas, native forest biomass and new small-scale technologies (Chapter 7);
- the diversity of access of renewable energy under the RET (Chapter 8); and
- administrative issues surrounding the SRES (Chapter 9).

1.3.4. Modelling

The Authority commissioned consultants SKM MMA to undertake electricity market modelling to determine the market impacts of potential changes to the RET. The modelling report, assumptions book and key outputs are available at the Authority's website. The results were used to inform the Authority's thinking, particularly in relation to Chapter 4 and Chapter 5.

1.4. Development of the Renewable Energy Target

The remainder of this chapter outlines the history of the RET and its predecessor, the Mandatory Renewable Energy Target (MRET).

Prior to the announcement of the MRET in 1997, Australia produced around 16 000 GWh of electricity from renewable sources. Most of this came from hydro-electricity schemes in Tasmania and the Snowy Mountains, however there were some smaller landfill gas, biomass (bagasse and black liquor), solar PV and wind-powered generators also in operation. Renewable generation then amounted to around 10.5 per cent of Australia's electricity supply.

1.4.1. The Mandatory Renewable Energy Target

In 1997 the Prime Minister, Mr John Howard, announced a suite of greenhouse response measures under the statement *Safeguarding the Future: Australia's Response to Climate Change*. The statement

was made at a time of global and domestic concern regarding the impacts of climate change (the Kyoto Protocol was agreed later that year). The statement committed Australia to reducing the growth in its emissions, from an expected increase of 28 per cent by 2010 in the absence of new abatement activities, to 18 per cent with the activities set out in the statement (Howard, 1997, p.3).

The introduction of the MRET was a key element of the statement, which would impose a legal obligation on electricity retailers and other large electricity buyers to source an additional two per cent of their electricity from renewable or specified waste-product energy sources by 2010. Following two years of negotiation between the Commonwealth, states and territories and stakeholders, the MRET was enacted in legislation. The *REE Act* created a liability for wholesale energy purchasers to purchase additional renewable energy by acquiring renewable energy certificates. The Act created a framework for renewable energy generators to create certificates, and established a regulator (the Renewable Energy Regulator supported by the Office of the Renewable Energy Regulator) to oversee and manage the scheme. According to the second reading speech to the House of Representatives, the MRET had both environmental and industry development objectives, which were to:

- accelerate the uptake of grid based renewable electricity in order to reduce greenhouse gas emissions;
- provide an ongoing base for the development of commercially competitive renewable energy as part of the broader package to stimulate the use of renewables; and
- contribute to the development of internationally competitive industries which could participate effectively in overseas markets (Commonwealth, House of Representatives 2000, p.18031).

The Act set a target of 9 500 GWh of additional renewable electricity to be generated by 2010. Certificates could be created for every megawatt hour of electricity produced above a renewable generator's baseline, which was set by the regulator as the average electricity produced between 1994 and 1996 by the generator (called the '1997 baseline'). No electricity produced below the baseline was eligible to create a certificate, nor were any fossil fuels, including waste products derived from fossil fuels, eligible to create certificates. For eligible generators, certificates could continue to be created until the final year of the scheme in 2020.

The Act established that an independent review of the Act must be undertaken in 2003.

1.4.2. The 2003 Tambling Review

The 2003 MRET review was chaired by Mr Grant Tambling (former Senator for the Northern Territory). It considered the extent to which the Act had contributed to reducing greenhouse gas emissions and encouraged additional renewable energy generation, as well as the achievement of policy objectives and the need to amend aspects of the Act or consider alternative approaches.

The review panel found that the MRET had broad community support, contributed significantly to additional renewable energy generation, resulted in some renewable energy exports, and had a very small negative effect on the Australian economy as a whole in terms of higher electricity costs (MRET Review Panel 2003).

The review made 30 recommendations. The most significant recommendation was for the target to increase over time, to reach 20 000 GWh in 2020. The review panel found that such an increase was necessary to:

- provide investment certainty and industry development opportunities;

- deliver the minimum 'critical mass' of investment needed to demonstrate commercial viability and create the potential for domestically manufactured components of renewable energy projects;
- establish a domestic demand base for the development of further export markets; and
- provide for a more managed investment framework that would promote cost effective technology improvements and industry learning.

In August 2004, the Commonwealth Government accepted most of the review's recommendations, but did not accept the recommendation to increase the target. Instead, the Commonwealth Government maintained its commitment to the 9 500 GWh target announced in 1997.

By 2007, there was sufficient capacity in place to meet the legislated targets and no further investment was necessary.

1.4.3. State and territory renewable energy target schemes

Following the Commonwealth Government's decision to maintain the 9 500 GWh renewable energy target, a number of state governments either considered or enacted their own renewable energy targets. A key driver for state-based initiatives was that without more ambitious targets, the renewable energy industry in Australia would stall.

Victoria, New South Wales and South Australia all announced renewable energy targets. Victoria announced a scheme in 2006 (Theophanous, Thwaites 2006). The Victorian Renewable Energy Target required electricity retailers to purchase a minimum of ten per cent of electricity from renewable energy sources by 2016. The New South Wales Renewable Energy Target was set at ten per cent of New South Wales end use consumption by 2010, and 15 per cent by 2020 (NSW Government 2006). A target of 20 per cent renewable electricity by 2007 was set in South Australia, which has the highest penetration of wind-powered generation in Australia. The South Australian target was achieved ahead of schedule in 2011, and South Australia is now aiming for its medium term target of 33 per cent renewable electricity generation by 2020 (Rann 2011). Both Victoria and South Australia enacted their respective targets in legislation, however only the Victorian target established a certificate based scheme to achieve its target.

1.4.4. The 2009 expanded Renewable Energy Target

In 2007, the Commonwealth Government embarked on a two year consultation period with state and territory governments and stakeholders to expand the MRET, which was agreed by the Council of Australian Governments in April 2009. The amended *Renewable Energy (Electricity) Bill 2000* was introduced into the House of Representatives in June 2009, one month after the Carbon Pollution Reduction Scheme was introduced. In the context of the proposed Carbon Pollution Reduction Scheme, the Commonwealth Government considered that the expanded RET would accelerate the development and deployment of renewable energy technologies while creating green jobs (Commonwealth, House of Representatives 2009, p.6252).

While the basis of the MRET remained, there were significant changes made to both the target and how it would be achieved. These changes included:

- increasing the target to 45 000 GWh in 2020, to be maintained until 2030;
- introduction of a multiplier (called Solar Credits), which would assist households and business with the upfront costs of small-scale renewable energy systems by applying a 'multiplier' to the number of certificates received from installation of small-scale generation technologies;

- providing a partial exemption from liability for emissions-intensive, trade-exposed activities, to reflect the cumulative cost impact of the RET and anticipated carbon price on those industries. The partial exemption applied only to the expanded part of the RET and not the 9 500 GWh target set under the original legislation; and
- allowing state-based renewable energy targets enacted under state legislation to transition to the RET. Victoria was the only state-based target subsumed by the RET.

1.4.5. The Renewable Energy Target today

In 2010, the Commonwealth Parliament passed amendments to separate the RET into two parts: the LRET and the SRES. Higher than expected uptake of small-scale systems – stimulated by falling system costs and the financial incentives offered through the Solar Credits multiplier and state and territory feed-in tariffs – had created a large spike in the number of certificates. This depressed certificate prices and discouraged investment in large-scale projects, which have very large capital requirements. The division of the RET was designed to address this issue by creating separate incentives for large-scale projects (such as wind-powered generators) and small-scale technologies (such as solar PV and solar water heaters). This meant that large-scale and small-scale technologies were no longer directly competing with one another under the RET scheme, effective from 1 January 2011.

The LRET is expected to deliver the majority of the target – 41 000 GWh of the original 45 000 GWh 2020 target – and retains many of the design features of the original MRET scheme.

The SRES is an 'uncapped' scheme which has annual targets based on the number of certificates expected to be created. Liability therefore tracks certificate creation, rather than placing a limit on it. This means the GWh contribution of the SRES by 2020 is uncertain. The SRES has an implicit target of 4 000 GWh of renewable energy generation or displacement of electricity through solar water heaters and heat pumps.

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CHAPTER 2. PERFORMANCE OF THE RENEWABLE ENERGY TARGET

This chapter considers how the Renewable Energy Target (RET) has performed against its objectives. It explores the increase in renewable energy generation, changes in greenhouse gas emissions and other impacts of the RET policy.

The objects of the *Renewable Energy (Electricity) Act 2000 (Cth)* are that the RET should encourage the additional generation of electricity from renewable sources, reduce emissions of greenhouse gas from the electricity sector and ensure that renewable energy sources are ecologically sustainable.

Within this context, this chapter considers the performance of the RET. It discusses the following issues:

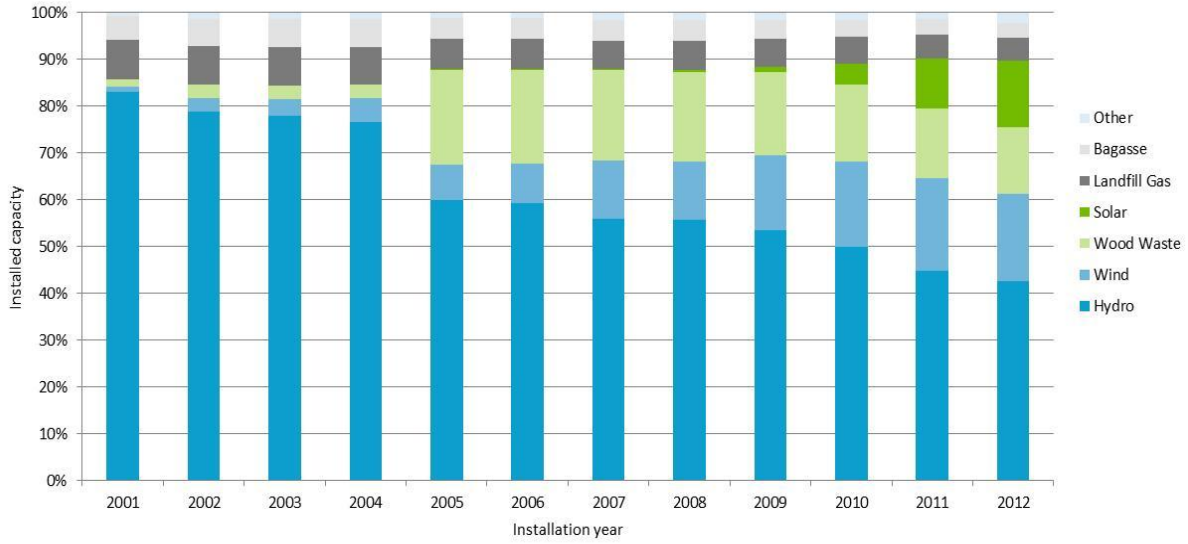
- the mix and quantity of renewable energy generation that the RET has stimulated, including certificate price information (section 2.1);
- the level of abatement that the RET has achieved (section 2.1.2);
- domestic and international renewables investment (section 2.2.1 to 2.2.3);
- cost performance of renewable technologies (section 2.2.4);
- impact of the RET on electricity prices (section 2.3); and
- distributional impacts of the RET (section 2.4).

2.1. Electricity consumption and generation

One of the objectives of the RET is to encourage an increase in renewable electricity generation. The RET's performance against this objective can be considered by looking at the change in renewable energy capacity and generation since 2001, when the RET's predecessor, the Mandatory Renewable Energy Target (MRET), was introduced.

Australia's renewable electricity capacity has more than doubled since the introduction of the MRET in 2001 (increasing from around 6 700 megawatts (MW) in 2001 to around 13 500 MW in 2012). Wind and solar photovoltaic (PV) generation have accounted for the majority of this increase (see Figure 1).

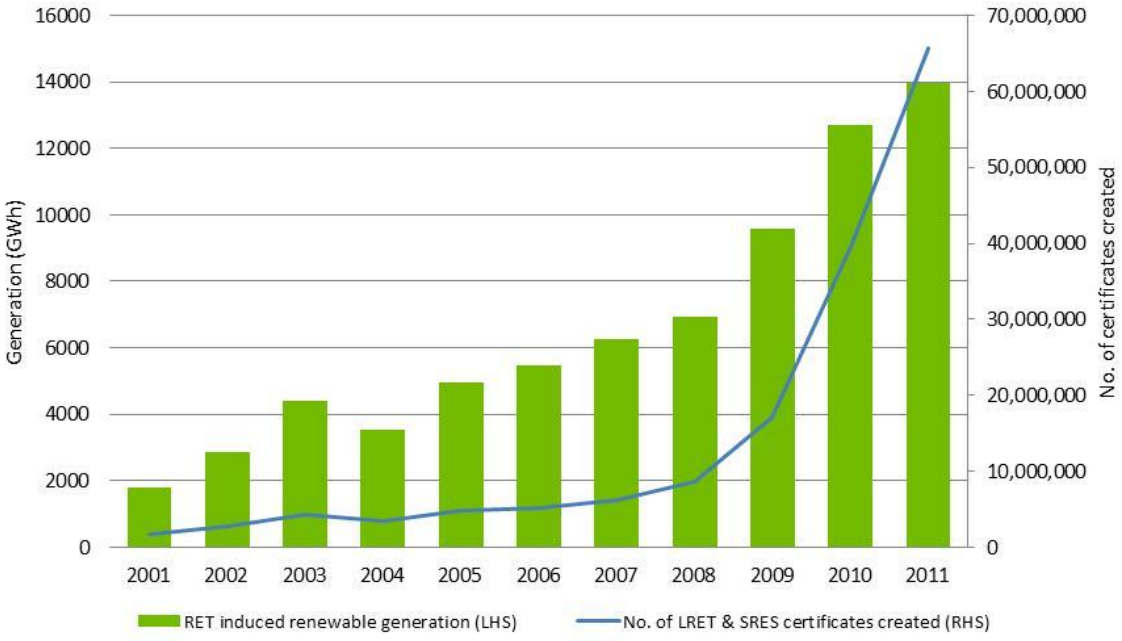
Figure 1 Technologies as a proportion of total installed renewable capacity, 2001-2012



Source: Australian Government, Clean Energy Regulator and Climate Change Authority.

This increase in renewable generation capacity has been supported by the sale of certificates under the RET. Almost 160 million certificates were created over the period 2001-2011, and generation eligible to participate in the RET produced almost 14 000 gigawatt hours (GWh) of electricity in 2011 (see Figure 2).

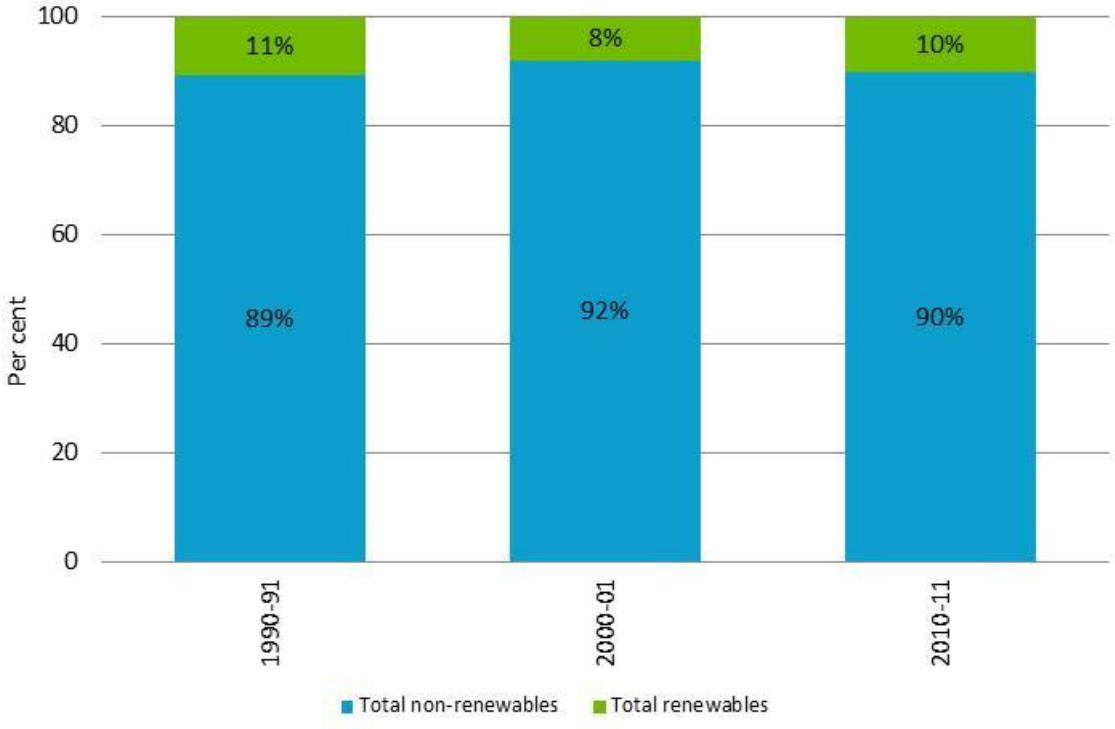
Figure 2 RET induced renewable generation and the number of certificates created



Source: Australian Government, Clean Energy Regulator and Climate Change Authority.
Note: 'RET induced renewable generation' has been calculated using RECs accounting for any multiplier impacts.

However, given electricity demand has increased by around 12 per cent since the introduction of the MRET, renewable generation as a proportion of total generation has not changed significantly over the period (see Figure 3).

Figure 3 Australian electricity generation mix



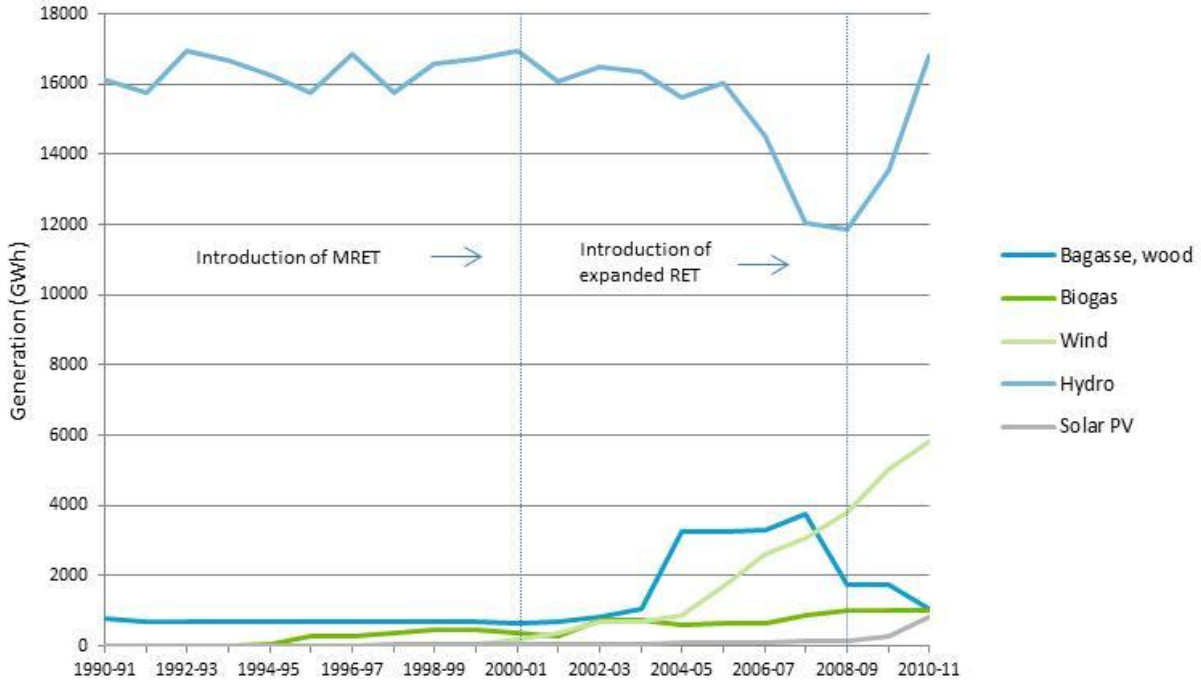
Source: Australian Government, Bureau of Resources and Energy Economics, *Australian Energy Statistics 2012*.

Wind generation has contributed significantly to the increase in the (absolute) level of renewable generation, offset to some extent by decreased generation from hydro due to low rainfall between 2005-06 and 2008-09. With favourable seasonal conditions over the past two years, hydro generation has recovered to around its long-run average whilst wind has continued to grow rapidly, generating more than 5 800 megawatt hours (MWh) in 2010-11, up from around 200 MWh in 2000-01 (see Figure 4).

Solar PV generation has also increased significantly, generating around 850 MWh in 2010-11, up from around 50 MWh in 2000-01 (See Figure 4). Solar PV installations have continued to rise in 2012 despite the downward adjustment to the solar credits multiplier (see Chapter 5). This increase has principally been driven by falling solar PV system costs. Data from the Clean Energy Regulator (2012) suggests that in real terms, the net cost of solar PV systems to consumers reduced by an average of 22 per cent between January 2011 and January 2012.

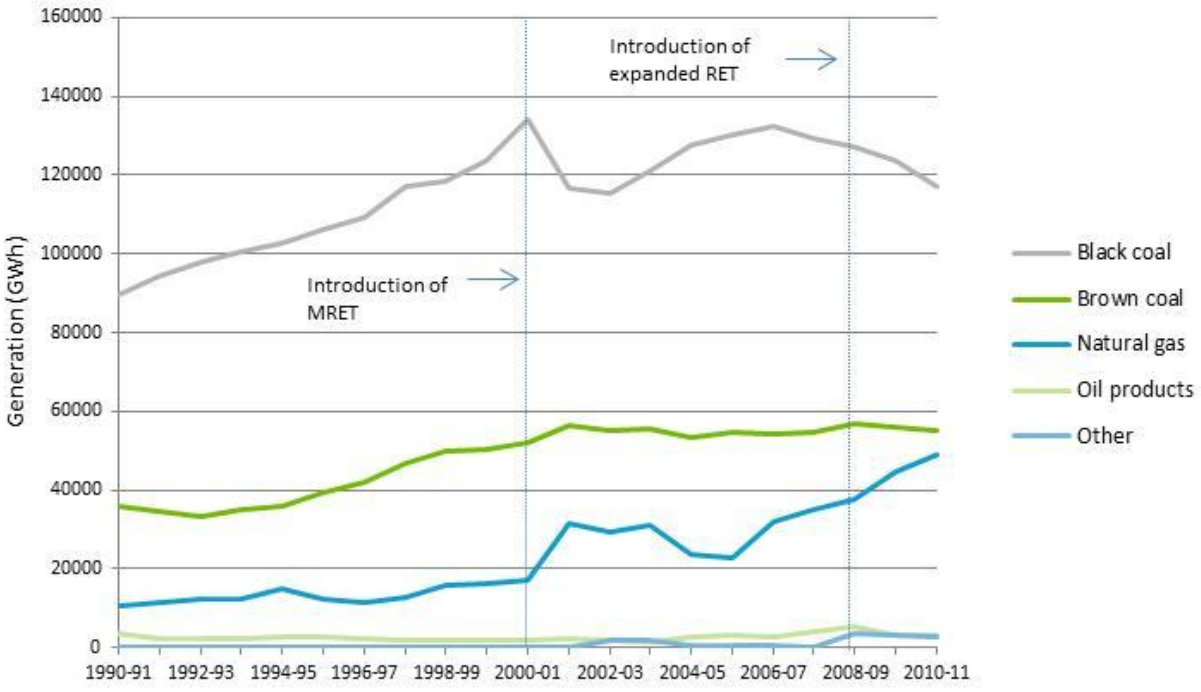
This increase in renewable energy generation has occurred in the context of an increase in non-renewable generation, which has risen by around 10 per cent between 2000-01 and 2010-11. However, the composition of non-renewable generation has changed considerably over this period. The contribution of natural gas to total generation has more than doubled, accounting for more than 20 per cent of total generation in 2010-11. Conversely, the contribution of black coal electricity generation to the electricity mix has decreased by more than 10 per cent, representing 46 per cent of total electricity generation in 2010-11 (decreasing to 116 949 GWh in 2010-11 from 134 264 GWh in 2000-01) (see Figure 5).

Figure 4 Australian electricity generation by renewable fuel



Source: Australian Government, Bureau of Resources and Energy Economics, *Australian Energy Statistics 2012*.

Figure 5 Australian electricity generation by non-renewable fuel



Source: Australian Government, Bureau of Resources and Energy Economics, *Australian Energy Statistics 2012*

2.1.1. Certificate price information

Prior to the split of the RET scheme, certificates were known as Renewable Energy Certificates (RECs). Between 2009 and 2011 the REC price was quite volatile (see Figure 6). This was largely due to the increased supply of certificates from small-scale technologies including solar water heaters and solar PV, driving the REC price down to less than $30 in late 2010. A certificate price this low would not

support the establishment of any new large-scale generation plants, which requires a certificate price of between $40 and $50 to meet wholesale electricity costs. The volatility in certificate price was one of the main reasons for the split in targets in 2012.

The splitting of the scheme established Large-scale Generation Certificates (LGCs) and the Small-scale Technology Certificates (STCs). The LGC price has been relatively stable since small-scale technologies were removed at the beginning of 2011. The STC price fell by around 50 per cent within a few months of commencement due to an oversupply of certificates relative to the Small-scale Technology Percentage (STP). This figure recovered throughout the year as the Clean Energy Regulator provided revised estimates of the following year's STP. The STC price has been reasonably stable in 2012, falling in the middle of the year, again due to perceptions that the creation of STCs would be significantly greater than the amount required by this year's STP.

Figure 6 Certificate price history

Source: Nextgen, http://www.nges.com.au/.

2.1.2. Abatement from the Renewable Energy Target

The second objective of the RET is to reduce emissions of greenhouse gases from the electricity sector. The RET reduces greenhouse gas emissions by encouraging the displacement of fossil fuel generation with renewable generation.

Assessing the impact of the RET on greenhouse gas emissions requires a counterfactual: what would emissions have been if the RET had not existed? This counterfactual cannot be observed; it must be estimated.

A number of emission reduction estimates have been calculated by various organisations overtime and often differ depending on the underlying assumptions used. One such recent study was conducted by SKM MMA, for the Clean Energy Council, which estimates emission reductions achieved by the RET and its predecessor, the MRET (SKM MMA, 2012). SKM MMA estimates that these policies induced

cumulative emission reductions of around 20 million tonnes of carbon dioxide equivalent between 2001 and 2012.

The SKM MMA report also indicates that over the period 2001-2012, around 90 per cent of the abatement achieved in the electricity sector was attributable to the RET and the MRET with the remainder attributable to other renewable generation support mechanisms. In addition, it suggests that Australia would not have met its Kyoto Targets, by around 2 to 3 percentage points, had it not been for the RET.

2.2. Industry development

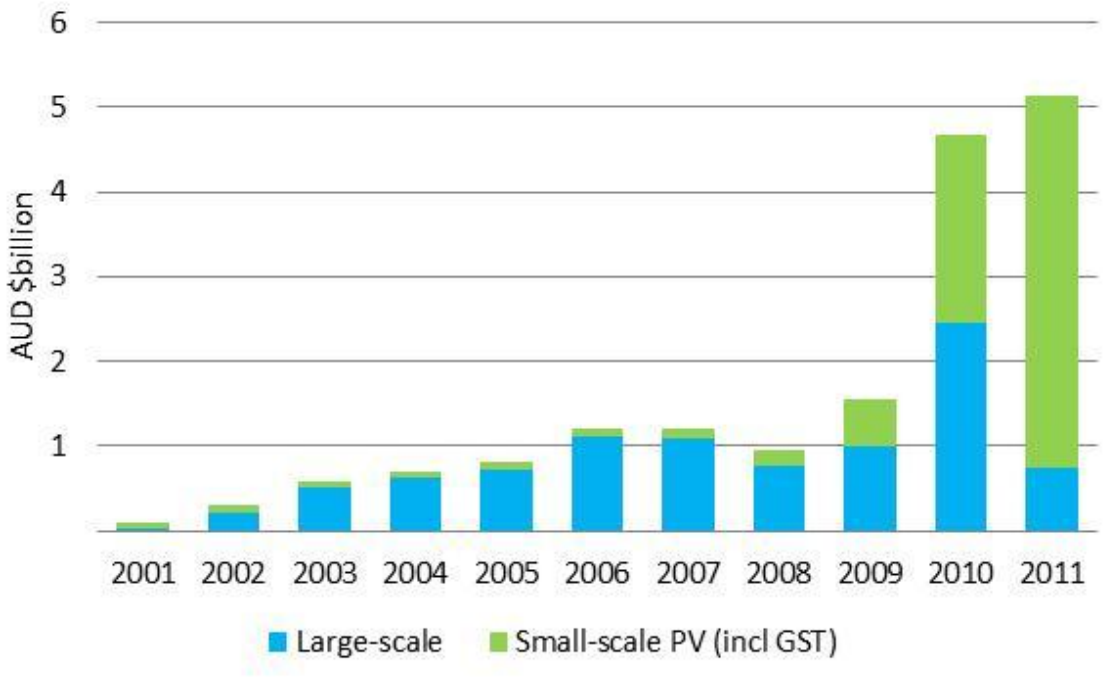
There have been a number of other impacts of the RET, and its predecessor the MRET, on the renewables market and electricity sector, in terms of investment and employment patterns.

2.2.1. Investment

The RET has stimulated considerable investment in Australian renewable energy over the last decade. In 2011, total investment in large-scale and small-scale renewable energy in Australia totalled in excess of $5 billion Australian dollars (AUD), almost 50 times more than the level of investment recorded in 2001 (see Figure 7).

Large-scale projects have dominated the total investment in the renewables sector for the majority of the past decade, however since the introduction of the expanded RET and adjustment to the solar credits multiplier, small-scale PV investment has eclipsed large-scale investment. In 2011, small-scale PV investment totalled more than AUD$4.3 billion.

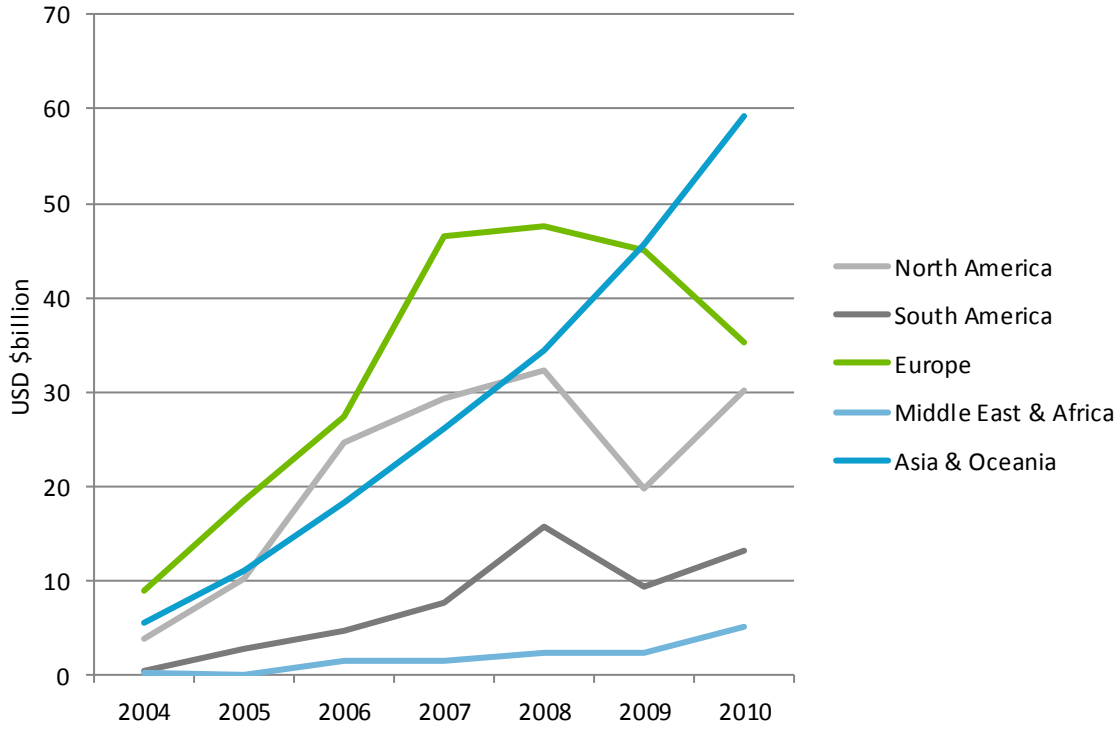
Figure 7 Total large & small-scale renewable energy investment in Australia (AUD billion)



Source: Bloomberg New Energy Finance, *BNEF Australia Investment Data*, 2012

Bloomberg New Energy Finance (2011) estimates that global investment in large-scale renewable technologies grew approximately sevenfold between 2004 and 2010, from $19.2 billion United States dollars (USD) to USD$142.7 billion (see Figure 8).

Figure 8 New financial investment in large-scale renewable energy by region, 2004-2010



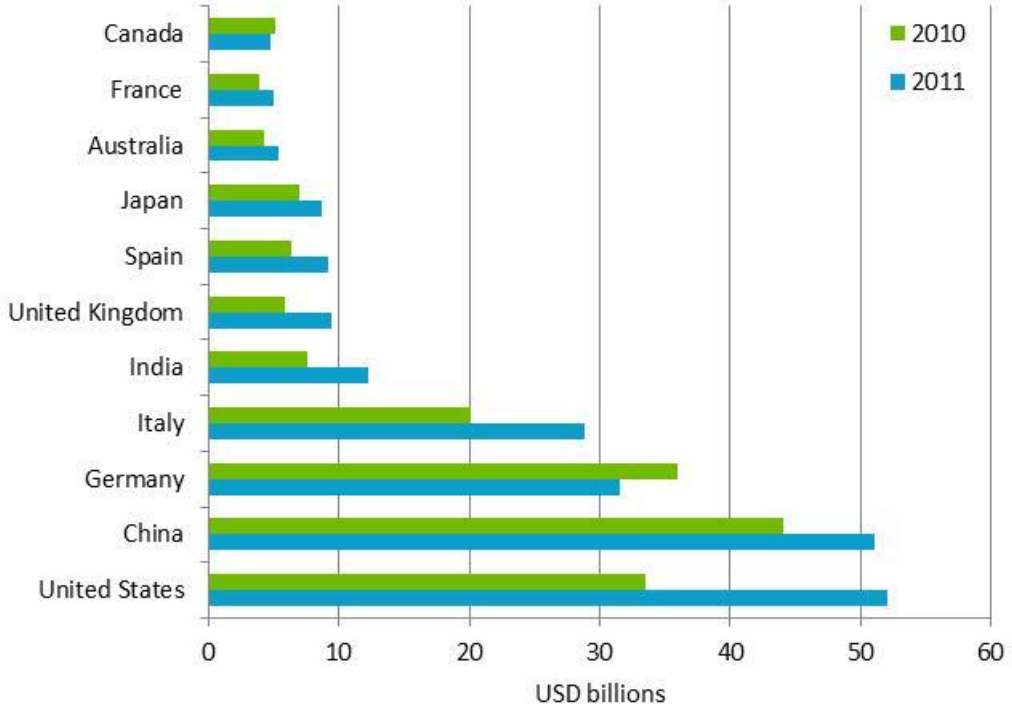
Source: Bloomberg New Energy Finance, UNEP Global Trends in Renewable Energy Investment 2011.

In terms of international comparisons, in 2011, Australia contributed around USD$5.3 billion, or 2 per cent, to global investment in clean energy. Whilst significant, this level of investment is unlikely to provide Australia with the ability to influence the costs of many renewable technologies (see Figure 9).

Many developed and developing countries are making significant clean energy investments (see Figure 9). Between 2010 and 2011, global new clean energy financial investment increased by more than USD$30 billion to a record USD$280 billion. Investments in Asia and Oceania accounted for 43 per cent of this growth, driven by expanded production of renewable technologies in China. On a global scale, wind and solar technologies have received the largest level of investment to date, however in 2010, biofuel investments exceeded wind investment.

Global investment in research and development and production are key to technology improvements and cost reductions. Collectively China and the United States accounted for more than 35 per cent of total investment in 2011, investing more than USD$50 billion each in clean energy investments.

Figure 9 Total new clean energy financial investment 2011 ($USD billion)



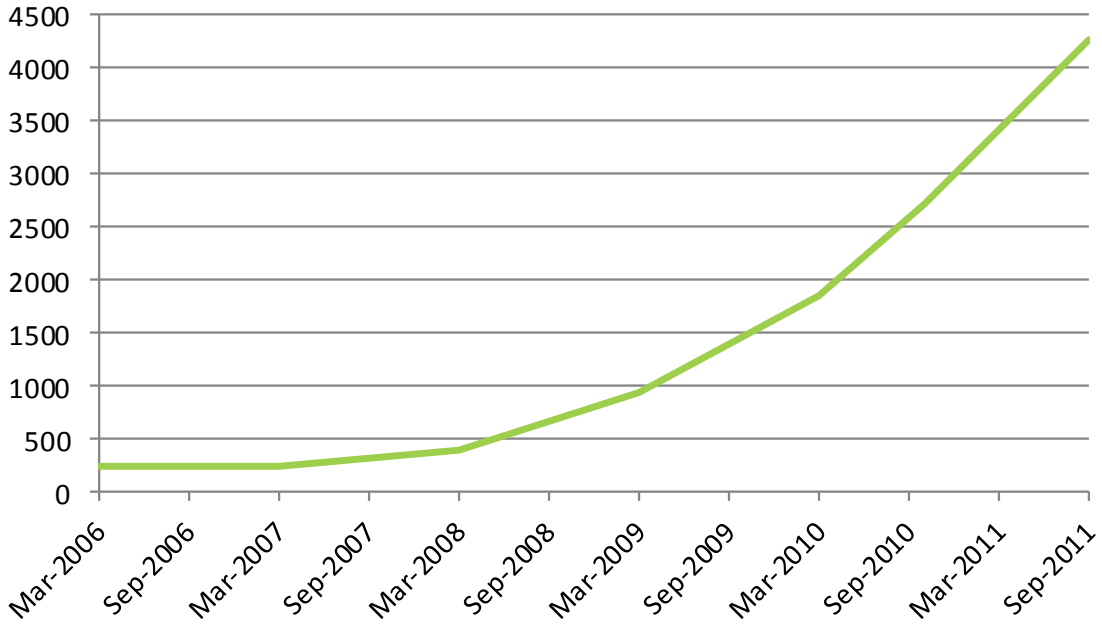
Source: Bloomberg New Energy Finance, 2011

2.2.2. The renewable energy industry in Australia

Although small relative to other parts of the world, Australia's investment in renewable energy stimulated by the RET has led to a rapid increase in the size and value of the renewable energy sector in Australia.

This record level of Australian investment has supported the growth of a number of new firms engaged in the renewable energy industry. Between March 2006 and September 2011, the number of accredited solar PV installers and designers in Australia increased by 1 700 per cent with over 4 200 accredited installers and designers in September 2011, up from 237 in March 2006 (see Figure 10). However, it should be noted that not all installers work full-time on installations and many alternate between other electrical work and solar PV installations.

Figure 10 Total number of accredited renewable energy installers and designers in Australia

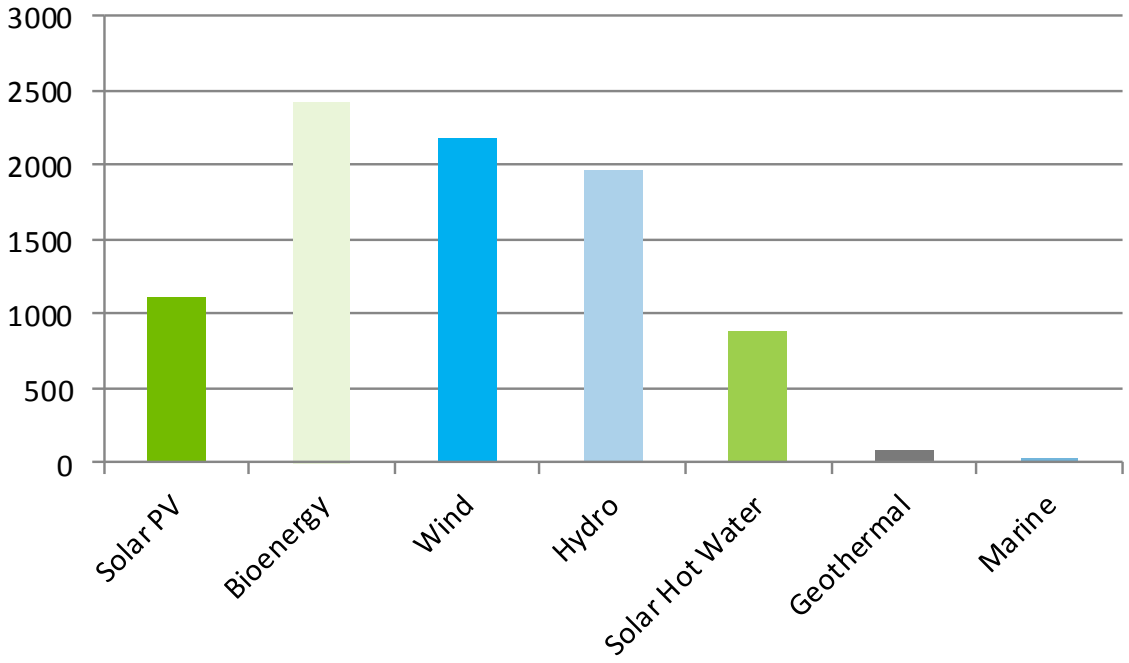


Source: Clean Energy Council Clean Energy Australia Report 2011

Employment growth in the renewable energy industry has also risen as a result of increased levels of investment. In 2010, the renewable energy industry employed more than 8 600 full-time employees, primarily in the bioenergy, wind, hydro, solar PV and solar hot water sectors (see Figure 11). New South Wales, Victoria and Queensland accounted for the majority, employing more than 70 per cent of the total number employed (See Figure 12).

It should be noted however, that these figures refer specifically to those directly involved in construction, installation, operations and maintenance activities. Renewable energy-related employment in sales, administration and management are not accounted for in these figures. For example, the Clean Energy Council (2011) estimates that a total of 6 000 people are employed across the distribution, sales and installation of solar hot water systems, however only around 900 people are directly reported as working in the sector.

Figure 11 Full-time equivalent jobs in the renewable energy industry, 2010



Source: Clean Energy Council Clean Energy Australia Report 2011

Figure 12 Full-time equivalent employees in the renewable energy industry by state, 2010

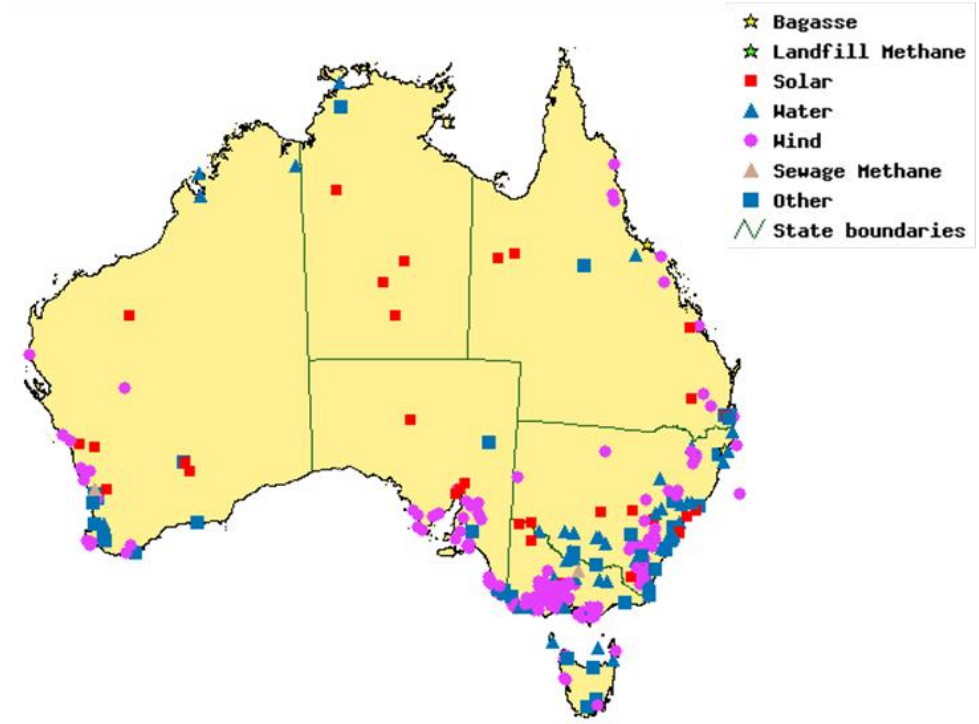
Source: Clean Energy Council Clean Energy Australia Report 2011

2.2.3. Distribution of large-scale generation units under the Renewable Energy Target

Increased investment and employment stimulated by the RET has had a widespread impact across Australia (see Figure 13). Today, large-scale renewable projects are scattered across all states and territories. Significant wind generation currently exists across large parts of southern Australia as well as hydro generation in Tasmania, Victoria and New South Wales. Solar generation is currently located

across much of central Australia while biomass is isolated to eastern Queensland. These investments have not only promoted employment as part of the construction phase of projects but have also ensured many long-term employment opportunities for remote and regional parts of Australia.

Figure 13 Renewable energy generation in Australia



Source: Geoscience Australia, 2012

2.2.4. Cost performance of technologies over time

The cost of several renewable technologies has decreased significantly over the life of the MRET and the expanded RET.

Domestic and international factors can influence the costs of installing renewable technologies in Australia. The majority of domestic costs relate to the construction and labour costs of a project. Improvements in Australian 'know how' relating to the domestic deployment of technologies and enhanced supply chains can be influenced by domestic policy.

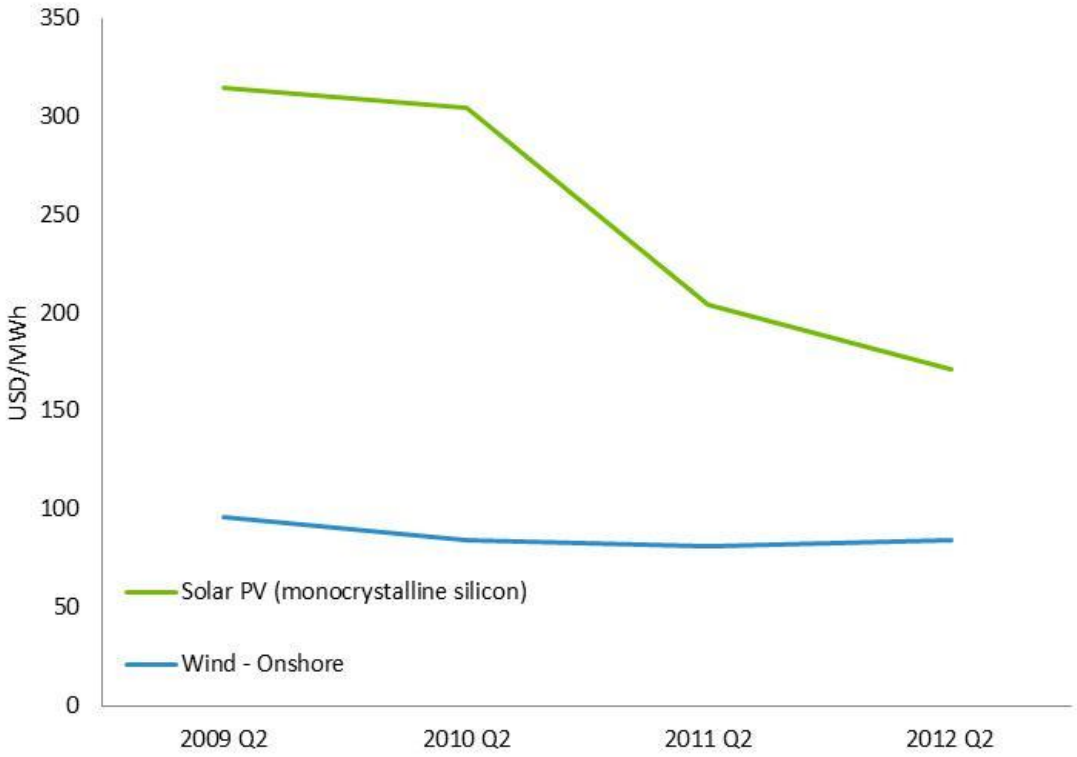
However, the most significant cost of most wind and solar PV installations (the two technologies currently dominating the RET) is the cost of the technology module. The Bureau of Resources and Energy Economics has estimated in their *Australian Energy Technology Assessment* (2012) that around 70 per cent of solar PV and onshore wind cost is made-up by international equipment costs, which is principally dominated by module costs. These international costs have fallen due to increased global production capacities which have created economies of scale, and improvements to the technologies themselves as a result of research and development. Given Australia is a relatively small player in renewable technology manufacturing and research and development, the RET has arguably had little to no impact on reducing these costs.

Many electricity generation technologies, renewables in particular, are characterised by high fixed capital costs and low running costs. Different types of technologies tend to operate at different capacity factors – that is, the proportion of the year for which they are producing energy. To try to compare the relative costs of different technologies when faced with varying capital and operating costs, as well as

different capacity factors, levelised costs are often used. The levelised cost of energy is a measure of the average cost per megawatt hour over the life of a generating electricity asset.

Historically, the levelised cost of energy of renewable technologies has been far higher than that of fossil fuel generation. However, the gap has been shrinking. At a global level, solar PV and wind costs, in particular, have dramatically decreased because of technology advancement (see Figure 14). Figure 4 in Chapter 3 outlines the decline in global solar PV module prices over the period 1976 to 2003.

Figure 14 Global levelised cost of energy



Source: Bloomberg New Energy Finance, 2012.

The Bureau of Resources and Energy Economics estimates that the cost differences in electricity generation between non-renewable and renewable sources are expected to diminish over time. Its 2012 report notes that the levelised cost of energy of solar PV and onshore-wind in Australia have declined significantly over the past few years and are expected to have the lowest levelised cost of energy of all technologies assessed by 2030 driven in most part by falling module costs and a rising international carbon price over this time (BREE, 2012).

The Authority is continuing to explore how the Australian cost of renewable energy has changed over time, and would welcome any evidence to demonstrate the impact that local deployment under the RET, rather than a general fall in international technology costs, has had on those costs.

2.3. Impact of the Renewable Energy Target on electricity prices

The RET's impact on electricity prices is the net result of two factors:

- the RET's effect on wholesale prices, which arises because of the change to the demand and supply balance in the electricity generation market; and
- the cost of certificates, which is passed on to consumers in retail prices.

2.3.1. Wholesale prices

All other things being equal, the RET can tend to have a depressing impact on wholesale electricity prices, compared with what they would otherwise have been, for two reasons. First, the RET can force additional supply into the market, when extra capacity may not have been required. Second, this extra capacity is generally characterised by low marginal costs of production – it sits at the bottom of the supply curve, and can at times avoid the dispatch of generators with higher short run supply costs, which would otherwise have been setting the market price.

The Authority has not commissioned modelling to estimate the historic effect that the RET and MRET may have had on wholesale prices. However, SKM MMA modelling commissioned by the Clean Energy Council estimated that for most states, the RET and MRET reduced average wholesale prices and this led to a reduction in retail prices (Clean Energy Council, 2012).

2.3.2. Cost of certificates

The reduction of wholesale electricity prices driven by the RET is offset by an increase in retail electricity prices due to the need for liable entities, generally electricity retailers, to purchase renewable energy certificates to acquit their annual RET liability. Liable entities generally pass on the costs of these certificates to energy consumers. Certificate prices have remained relatively stable in recent years however are expected to fall with the introduction of the carbon price mechanism. Section 2.1.1 discusses certificate prices in more detail.

2.3.3. Retail prices

The RET's impact on retail prices depends on the net impact of its effect on wholesale prices and the cost of certificates

In jurisdictions where retail prices are regulated, the relevant economic regulator, as part of its price determination, estimates the cost impact of the RET and sets an allowable limit on the RET-related costs that can be recovered from consumers through retail price tariffs.

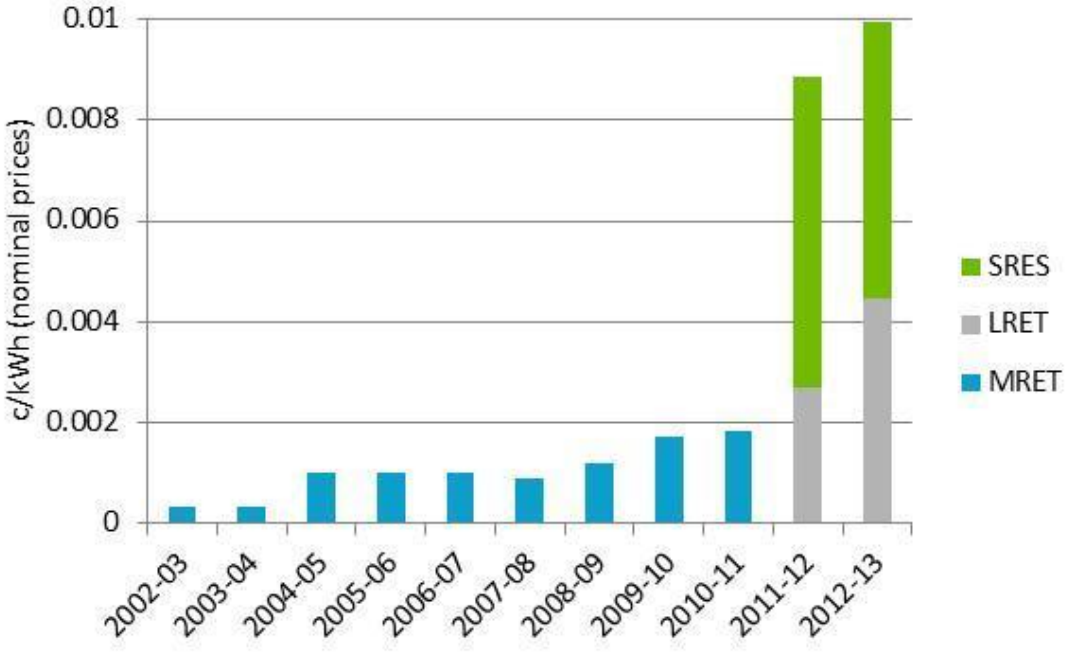
In New South Wales, the Independent Pricing and Regulatory Tribunal (IPART) allowed for a sharp rise in the RET component of regulated tariffs in 2011-12 and 2012-13 (see Figure 15) (IPART, 2012).

IPART estimates that the effect of the RET on a typical New South Wales customer's annual electricity bill in 2012-13 will be around $70, which represents around 3 per cent of the total electricity bill. It should be noted that the IPART 2011-12 figures assume a Small-scale Renewable Energy Scheme (SRES) price of around $40 per STC, while the actual costs of certificates has averaged at around $30 in 2011-12. It is possible that customers who found a competitive retail offer, rather staying on the regulated tariff, may have paid a lower SRES cost, reflecting this price difference.

SKM MMA modelling commissioned by the Authority estimates retail price forecasts under a number of scenarios (see Chapter 4). Under current settings, the modelling indicates that the effect of the RET on a typical Australian's annual electricity bill in 2012-13 will be around $62, accounting for around 4 per cent of the total electricity bill.

Furthermore, the Australian Energy Market Commission's *Impact of the enhanced Renewable Energy Target* (2011) on energy markets stated that the cost of the RET represented around 3 per cent of residential retail electricity prices in Australia in 2011-12.

Figure 15 Electricity price tariffs in New South Wales due to the RET in c/kWh, 2002-03 to 2012-13



Source: IPART determinations and reviews of regulated retail prices for electricity, 2002-2012.
Note: Tariffs have been averaged where determinations provide an allowable range.
Note: IPART did not incorporate the announced RET changes into its 2010/11 determination.

2.4. Distributional impacts of the Renewable Energy Target across states and socio-economic issues

The distribution of the costs and benefits of the RET can be considered according to their impacts on different household types and on different regions.

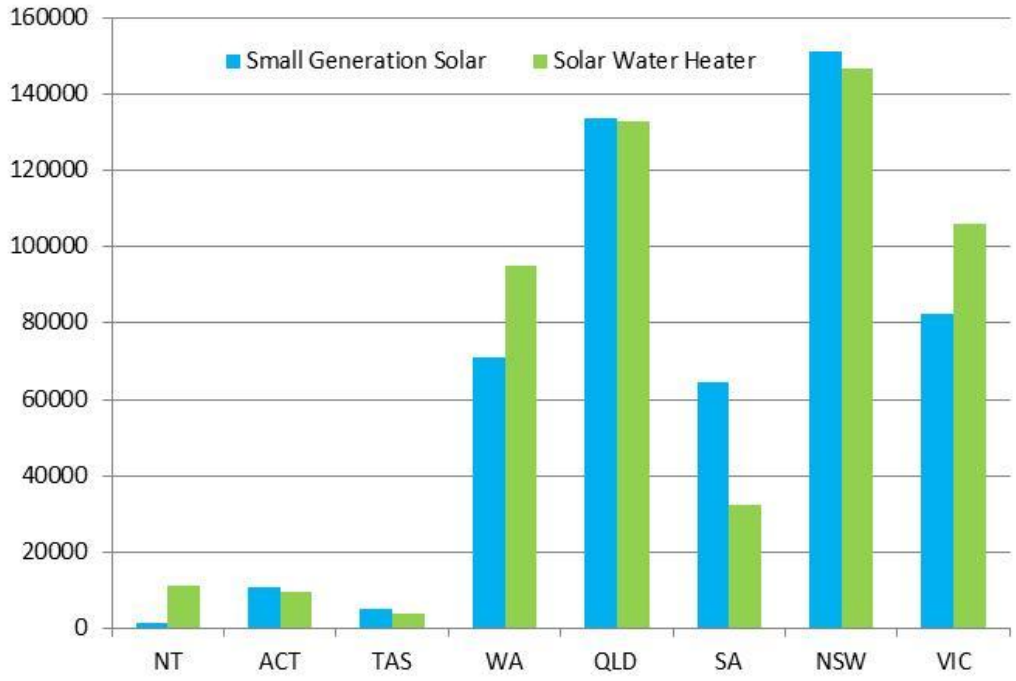
2.4.1. Equity of benefits across households – beneficiaries

The geographic distribution of installations since the commencement of the RET by state and territory is shown in Figure 16.

New South Wales and Queensland have the highest number of installations for both solar PV and solar water heaters. On a per capita basis, however, the Northern Territory has the highest penetration of solar water heaters, while South Australia has the highest penetration of solar PV units (see Figure 17).

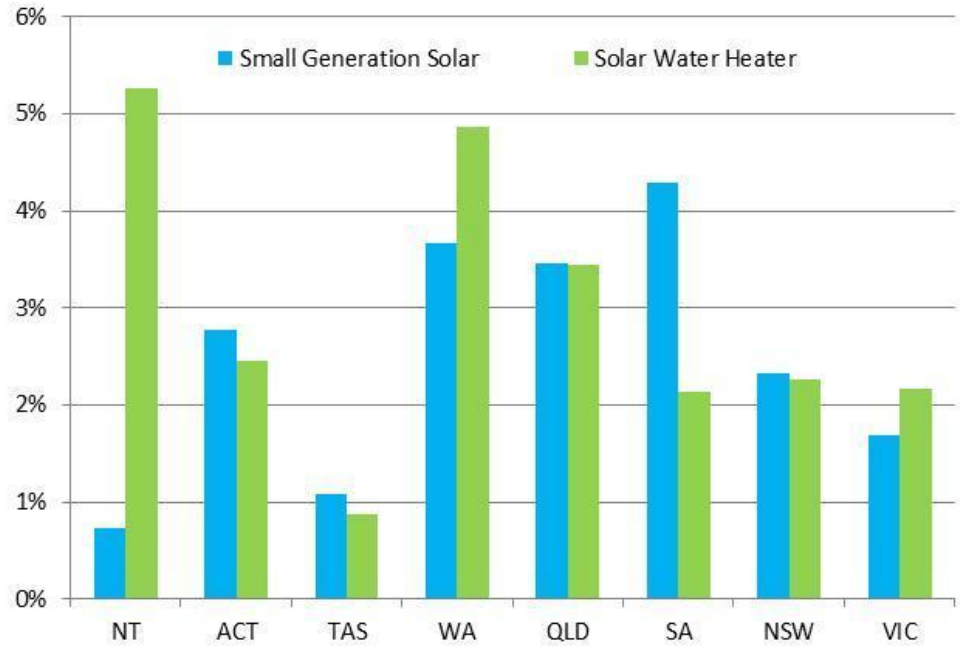
The demographics of areas with high or low SRES penetration are also of interest in considering the equity of the SRES scheme. A study by Seed Advisory Pty Ltd investigated the characteristics of postcodes which had installed solar PV and solar hot water under the RET (2011). The study found that postcodes with higher average income generally had a lower take-up of solar PV than the national average. Penetration of solar PV was also found to decrease with higher proportions of people in the 20-34 age bracket and higher proportions of people with low literacy levels. Similar results were found for the installation of solar water heaters, which also decrease in penetration at higher population density levels.

Figure 16 Number of small-scale systems installed by state and territory, 2001 to September 2011



Source: Clean Energy Regulator, list of SGU/SWH installations by postcode; Australia Post postcode book extract.
Note: There are a small number of suburbs in different states which have the same postcode. Installations in those postcodes could not be accurately reconciled to a state

Figure 17 Penetration of small-scale systems installed by state and territory, 2001 to September 2011



Source: Clean Energy Regulator, *List of SGU/SWH installations by postcode;* Australia Post postcode book extract

A study by the REC Agents Association has found that 53 per cent of all solar systems were installed in regional and rural communities with only 43 per cent installed in the major capital cities. Solar penetration was around 13 per cent in the major capital cities and was 21 per cent outside of the major capital cities (60 per cent higher penetration) (REC Agents Association, 2012).

The study found that systems installed in capital cities were typically in the outer metropolitan mortgage belt with the highest level of solar system penetration in each state tending to be in either regional or outer metropolitan areas.

While some households have benefited from the RET, all energy consumers, including households, pay for the cost of the RET due to the costs that renewable energy certificates add to retail electricity prices.

2.4.2. Impact on household expenditure

Conceptually, the RET can be considered as equivalent to a tax on electricity consumption levied to promote the development of the renewable energy industry. The incidence of this 'tax' affects households in particular income groups in different ways.

Analysis conducted by the Australian Bureau of Statistics, Household Expenditure Survey 2009-10, indicates that households with the lowest disposable income spend $7 less each week on domestic fuel and power (including gas and electricity) than the average household. However, these households spend the highest proportion of expenditure on domestic fuel and power (4 per cent) compared with the average household (2.6 per cent). Expenditure does, however, vary between low income households, depending on the dwelling type and the number of occupants.

Of households with the lowest disposable income, 17.9 per cent had experienced an inability to pay electricity, gas or telephone bills on time during the 12 months before the survey, compared with the average household figure of 12.5 per cent.

While the Commonwealth Government has created the Household Assistance Package to offset increases in cost of living as a result of the carbon price for low income households, it was not intended to cover higher electricity costs due to the RET.

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CHAPTER 3. ROLE OF THE RET

This chapter considers the role of the Renewable Energy Target (RET) given the introduction of the carbon pricing mechanism and the establishment of the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC).

The policy landscape has changed considerably since the Renewable Energy Target, and its predecessor the Mandatory Renewable Energy Target (MRET), were first established. The most significant of these changes were announced in the Commonwealth Government's July 2011 Clean Energy Future Plan, which included the pricing of greenhouse gas emissions through the carbon pricing mechanism, the establishment of the Australian Renewable Energy Agency and the Clean Energy Finance Corporation.

Consideration of the objectives of these policies and how they interact with the RET is important context for considering the role the RET should play into the future and its expected impact on economic efficiency, environmental effectiveness and broader social impacts.

It is within this context that this chapter considers the role of the RET. It discusses the following issues:

- the changed policy landscape (section 3.1);
- cost reductions in local deployment from learning-by-doing (section 3.2.1);
- uncertainty surrounding the future of the carbon price (section 3.2.2);
- the Authority's approach (section 3.3); and
- the frequency of reviews of the RET (section 3.4).

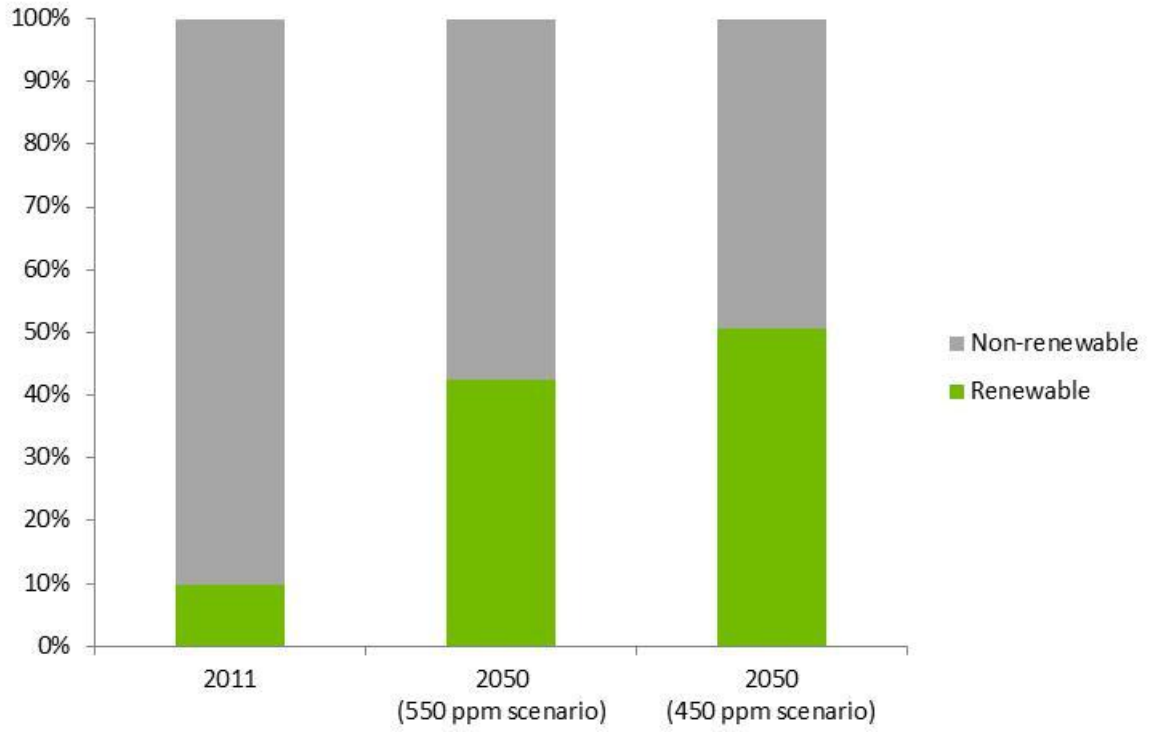
3.1. The Renewable Energy Target in the current broader policy context

According to REN21 (2012), Australia is one of at least 118 countries that have a renewable energy target policy. While the primary motivations for such policies vary across countries, a key motivator is the role that renewable energy is expected to play if the risks of dangerous climate change are to be reduced (the term 'dangerous climate change' is drawn from the objective of the United Nations Framework Convention on Climate Change (UNFCCC), which is to 'prevent dangerous anthropogenic interference with the climate system' (UNFCCC 1992)).

A number of studies, both internationally and in Australia, suggest that a large expansion of renewable energy is estimated to be part of a least cost way of achieving deep cuts in global greenhouse gas emissions. For example, the International Energy Agency (IEA) estimated what would be required to limit the increase in mean global temperatures to two degrees centigrade. In this scenario, global greenhouse gas emissions from the power sector in 2050 have to be cut by almost 80 per cent from today's levels (IEA 2012). By 2050, more than 90 per cent of the world's energy demand is estimated to be met by low-carbon technologies, with renewable technologies providing at least half of the world's electricity mix.

In the Treasury's modelling of an equivalent level of global ambition (the 'high-price' scenario stabilising emissions at 450 ppm), renewable energy in Australia reaches 50 per cent of total generation by 2050. In the core policy scenario (equivalent to 550 ppm stabilisation) renewable energy grows from less than 10 per cent today to over 40 per cent by 2050 (see Figure 18) (Australian Government Department of Treasury, 2011).

Figure 18 Renewables share of total generation in Australia



Source: Australian Government Department of Treasury, 2011

The legislative objects of the RET reflect a view that the renewable energy industry must be expanded and developed to promote greenhouse gas emissions reductions in the electricity sector. The 2003 Tambling Review of the MRET summarised these objectives as reducing greenhouse gases and promoting industry development:

> *Section 3 of the Act does not specifically nominate industry development as an object of the Act. However, the Act's first objective is "to encourage the additional generation of electricity from renewable sources". The achievement of this object clearly creates opportunities for the development of the renewable energy industry. (Australian Greenhouse Office, 2003 p.19)*
>
> *'The Act specifically states that an object of the MRET measure is 'to reduce emissions of greenhouse gases'. In development of the legislation, the Renewables Target Working Group note that: 'The [MRET] is primarily a long-term greenhouse response measure achieved through development of industry capacity, although it will generate direct greenhouse emission reductions in the medium term. (Australian Greenhouse Office, 2003 p.25)*

From the perspectives of both greenhouse gas emissions reductions and industry development, the policy landscape has changed considerably since the RET (and particularly its predecessor, the MRET) was first introduced. The Authority has considered what role the RET might play in this new policy environment, to inform its recommendations on scheme design.

3.1.1. Carbon pricing mechanism

When the MRET was legislated, there was no national carbon price in place, and the Commonwealth Government had no plans to implement such a scheme. In this context, the MRET was expected to play a key role in helping Australia to meet its emissions reduction target under the Kyoto Protocol.

Since 1 July 2012, however, a national carbon price is in place.

The carbon pricing mechanism has been designed to be the primary tool for reducing Australia's greenhouse gas emission levels. It requires liable entities to report their emissions and surrender sufficient carbon units (equal to one tonne of emissions) to account for them (see Box 3). The carbon pricing mechanism, that has a broad coverage of emissions sources, allows for carbon units to be traded and is linked to international markets. This means that the market will determine the most cost effective way to reduce emissions, with the cheapest opportunities pursued first whether they are in Australia or overseas.

Box 3 Carbon pricing mechanism

The Australian carbon pricing mechanism commenced on 1 July 2012.

Liable entities will report on their emissions and buy and surrender to the Government a carbon unit or international unit for every tonne of greenhouse gas emissions they produce.

For the first three years of its operation (until 1 July 2015), the carbon pricing mechanism has a fixed price starting at $23 per tonne of greenhouse gases emitted and growing at around 5 per cent in real terms each year. The amount of carbon units that liable entities need to meet their obligations will be available at the set price.

From 1 July 2015, the carbon pricing mechanism shifts automatically to an emissions trading scheme with a flexible price. The total number of carbon units issued by the Government will be capped. Australian emissions covered by the scheme can only exceed the cap if approved domestic or international carbon offsets are surrendered instead.

The price will then be determined by the market. Liable entities will compete to buy the number of carbon units they need to meet their obligations. Those that value the carbon units most highly, because the cost of reducing their emissions is higher, will be willing to pay the most for them. Others will reduce their emissions if they can do so at a cost that is less than the carbon price.

From the start of the flexible price period, liable entities will also have access to international carbon markets to buy international units which represent emissions reductions that have occurred in another country. This means that liable entities can access emissions reductions in other countries if these can be achieved at a lower cost than emission reductions in Australia. The Australian scheme will be linked to the European Union's Emissions Trading Scheme from the start of the flexible price period. European Union Allowances will be able to be used for compliance in the Australian scheme.

Liable entities must not surrender more than 50 per cent of their liability using international units including a 12.5 per cent limit on the use of Kyoto units (Certified Emissions Reductions, Emission Reduction Units and Removal Units).

The RET will interact with the internationally-linked carbon pricing mechanism in three important ways.

First, in the presence of a carbon price, the RET is likely to increase the short-term cost of achieving the emissions reduction target. This is because it mandates the type of abatement that has to occur. While the RET will, in general, promote the least cost renewable energy generation, it nonetheless mandates that abatement must come from renewable energy regardless of whether it is the cheapest form of abatement across the economy in the short-term. If the RET is not adding any cost in the short-term, the policy is redundant, as the carbon pricing mechanism and other policies are driving sufficient renewable energy to meet the RET.

The Productivity Commission's review of greenhouse gas reduction policies in a range of key economies concluded that broad-based carbon prices are likely to deliver abatement at a lower cost than industry-specific policies such as the RET:

> *Emissions trading schemes were found to be relatively cost effective, while policies encouraging small-scale renewable generation and biofuels have generated little abatement for substantially higher cost. (Productivity Commission, 2011, p.xiv)*
>
> *It is generally recognised that the most direct and, consequently, most efficient way of implementing the 'relative price' change required to discourage consumption of high-emission products in favour of low-emission ones, is through a global, broadly-based carbon tax or quota scheme (emissions trading scheme). (Productivity Commission, Carbon Emissions Policies in Key Economies, May 2011, p.49)*
>
> *Emissions trading schemes are found to have been the most cost-effective instruments identified. (Productivity Commission, Carbon Emissions Policies in Key Economies, May 2011, p.79)*

In modelling commissioned for this review, SKM MMA found that the additional reductions in greenhouse gas emissions driven by the RET on top of the abatement already driven by the carbon price cost, on average, an additional $36 per tonne.

Second, there is an interaction between certificate prices under the RET and the carbon price. Under the current design of the carbon pricing mechanism, the carbon price will affect certificate prices under the RET, but the RET will not have any impact on the carbon price. Until 1 July 2015, the level of the carbon price is fixed in legislation. Thereafter, the carbon pricing mechanism allows the use of international offsets, including European Union Allowances. As the European carbon market is much larger than Australia's carbon market, and given that the 50 per cent limit on liable entities' use of European units is unlikely to be binding, Australia is expected to be a price-taker. In other words, Australia's carbon price will closely align with the European price. Renewable energy policies, such as the RET, will therefore not influence the carbon price.

The level of the carbon price, however, affects the price of certificates under the RET. RET certificate prices represents the 'top up' on wholesale prices required to make renewable energy viable. All other things being equal, in Australia, higher carbon prices are likely to lead to higher wholesale prices, which therefore implies lower RET certificate prices.

Third, the RET will affect the pattern of emissions abatement in Australia. In the case of a closed emissions trading scheme, which did not permit the import of international units, a RET and carbon price would not drive more emissions reductions in Australia than a carbon price alone. The RET would independently drive the deployment of more low emissions technologies. In turn, this means that the demand for carbon units from the electricity sector would be lower than otherwise. This reduced demand would result in a lower price for carbon units. Faced with this lower carbon price, emitters in

other sectors of the economy would be likely to do less abatement than they would have done if they had faced a higher carbon price. Total national emissions would equal the cap, but the RET would cause more abatement in the electricity sector and less in other industries than if the RET did not exist.

In the case of an emissions trading scheme with relatively unrestricted access to the international carbon market (such as Australia's carbon pricing mechanism from 1 July 2015), reducing demand for units in the electricity sector is much less likely to cause a fall in the carbon price. As mentioned above, this is because, Australia is far more likely to be a price-taker from international carbon markets. If Australia is a price-taker, the effect of the RET on emissions will be to:

- reduce emissions and demand for units in the electricity sector (therefore increasing domestic abatement); and
- not result in any changes to abatement activities of other sectors (which would respond to the unchanged international carbon price).

3.1.2. The Australian Renewable Energy Agency and Clean Energy Finance Corporation

In relation to the industry development goal of the RET, two new institutions (the ARENA and the CEFC) have been created, adding new dimensions to the overall renewable energy industry development policy.

ARENA's role is to provide grant funding of around $3.2 billion to support innovations that improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia. While ARENA's mandate is broad, it is expected to work primarily in the early stages of the innovation chain, supporting research and development into promising and emerging renewable energy technologies (see Figure 3).

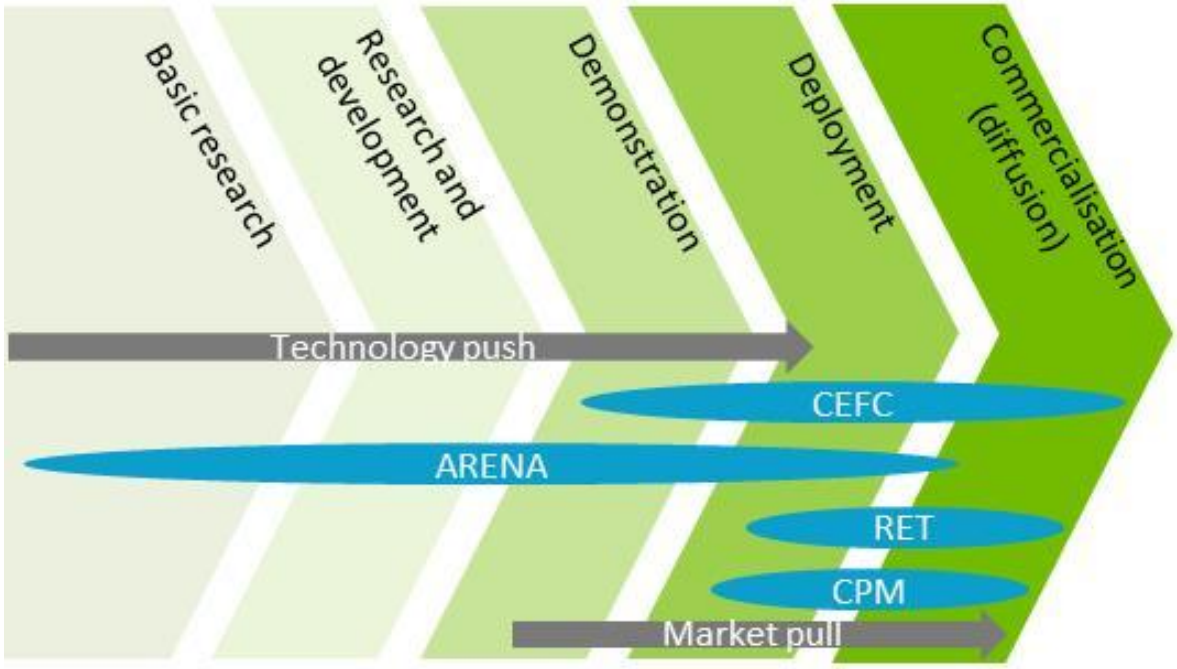
The objective of the CEFC is to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies. It will invest in projects or firms on a commercial basis, seeking to catalyse private sector financing not previously available to clean energy technologies and therefore contribute to the growth of the clean energy industry. The CEFC has a goal of allocating fifty per cent or more of its total of $10 billion in funding to renewable energy investment, and the remainder to low-emissions and energy efficiency investment. The CEFC is intended to be commercially oriented and make a positive return on its investments. The CEFC is therefore designed to complement the work of ARENA and its focus is further along the innovation chain (see Figure 3). Furthermore, accordingly to the CEFC:

> *CEFC will finance Australia's clean energy sector using financial products and structures to address the barriers currently inhibiting investment. The Panel considers an appropriate objective to be:*
>
> - *apply capital through a commercial filter to facilitate increased flows of finance*
> - *into the clean energy sector thus preparing and positioning the Australian*
> - *economy and industry for a cleaner energy future. (Australian Government Department of Treasury, 2012 p.ix)*

The RET supports the deployment of market-ready renewable energy technologies, where the chief barrier to 'business as usual' deployment is cost. ARENA and the CEFC appear likely to target renewable technologies at an earlier stage in their development – that is, technologies that would not

otherwise be deployed under the RET. The Authority believes that ARENA and the CEFC are likely to influence the range of technologies that could ultimately be supported by the RET.

Figure 19 Position of Government policies along the innovation chain



3.2. Role of the Renewable Energy Target

In light of the broader policy context in which it now operates, it is necessary to consider what role the RET should play.

Literature on the effectiveness of energy technology policy and on the economics of innovation strongly supports the need for both technology-push and market-pull policies, although the emphasis will generally shift from push to pull as technologies mature (IEA, 2012). As both the RET and the carbon pricing mechanism act as market-pull policies, there needs to be a justification for the additional demand for renewables created by the RET over and above that encouraged by the carbon price.

The RET may continue to be important if it assists to:

- minimise the cost of climate change mitigation over time;
- mitigate the risk that uncertainty surrounding the carbon price (both in Australia and in Europe) suppresses investment in low-emissions technologies; and/or
- mitigate against other risks or create other benefits (such as energy security, public health or increased retail competition).

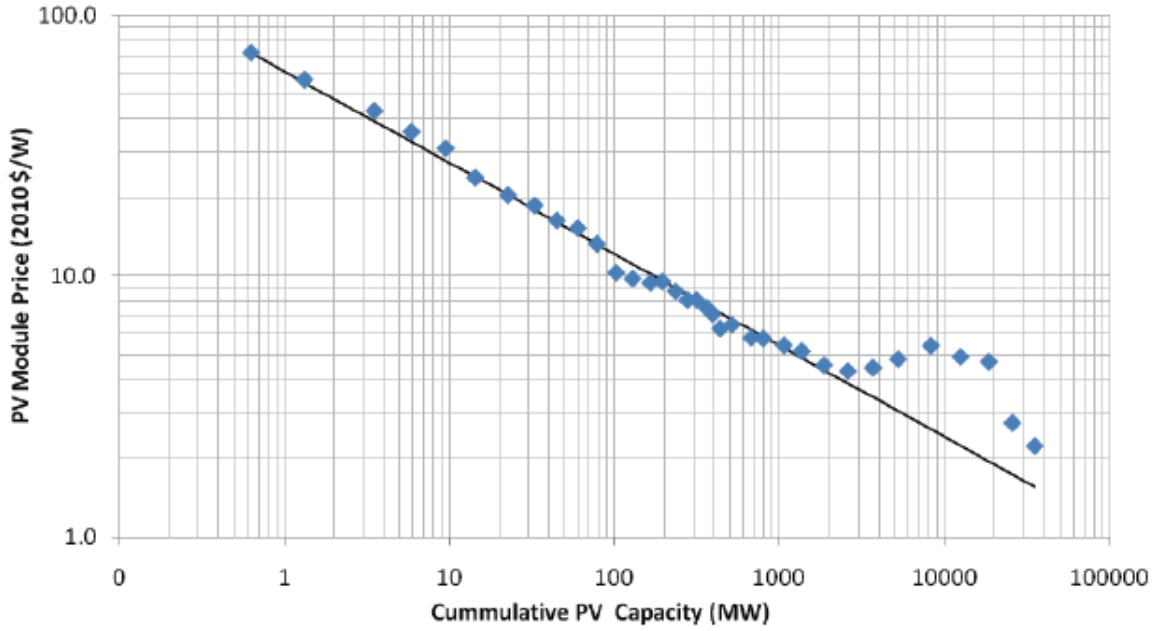
3.2.1. Minimising the cost of climate change mitigation over time

Climate change is a long-term issue that requires policy makers to take a long-term view. The IEA and the Commonwealth Treasury have emissions scenarios out to at least 2050, and the Fourth Assessment Report of the Intergovernmental Panel on Climate Change has emissions scenarios out to 2100. Global mitigation efforts will be needed throughout and beyond this century if the risks of dangerous climate change are to be reduced.

While the RET will increase the cost of achieving an abatement target in the short term, there may be a case for doing so if such investment in renewables in Australia leads to sufficient cost reductions in the longer-term to provide net benefits. The cost reductions associated with deployment are well documented and referred to as learning curves, or the learning-by-doing effect. Short-term increases in the costs of emissions reductions can be weighed against the long-term cost reduction derived by deployment experience. Early support could potentially bring down technology costs and lead to lower total abatement costs over the long term for a given level of emissions reduction.

Technology learning rates are generally defined as the cost reduction for a doubling of capacity. For example, globally, solar photovoltaic modules have shown a learning rate of 22 per cent over the period 1976 to 2003 (see Figure 4) (Melbourne Energy Institute, 2011).

Figure 4: Historic experience curve for PV with 22 per cent learning rate globally



Source: Melbourne Energy Institute, 2011

In their projections of technology costs, the IEA and the European Photovoltaic Industry Association expect that, with continued investment in solar PV, the historic learning rate will continue into the future. The IEA expects the capital cost for utility scale PV facilities to drop by 40 per cent by 2015, and 50 per cent by 2020 (IEA, 2010).

Wind-powered generation has also experienced cost reductions as capacity has increased. Historic learning rates have been around 10 per cent (European Wind Energy Association, 2009). While a more mature technology than solar PV, the IEA expects the future learning rate for wind generation to be at about 7 per cent (IEA 2010). The IEA Roadmap for wind generation expects investment costs to decrease for onshore wind by 23 per cent by 2050 and for offshore wind by 38 per cent by 2050 (IEA, 2009).

Global increases in the deployment of renewables have led to considerable cost reductions over time. However, given that most renewable energy equipment is currently manufactured overseas, there is an important question as to the extent to which Australian deployment can reduce the cost of renewables. Furthermore, in a mitigation framework were Australia can access low cost emissions reductions that occur overseas, consideration needs to be given to the impact on the cost of deploying renewable energy in Australia relative to the cost of emissions reductions overseas.

A large component of the cost reductions associated with renewable technologies is a result of a decrease in unit costs, which are produced overseas. Australian policy measures are likely to have only a marginal impact on the unit cost of renewable technologies as it is a function of the scale of production worldwide. Other elements of the cost of renewable technologies, such as the cost of finance, are influenced by domestic conditions but are a function of wider economic conditions and these are unlikely to be influenced greatly by the RET. Nonetheless, there is still the potential for policy measures such as the RET to reduce the costs of deployment, for example through reducing labour costs with more specialised skills and efficiencies in project development.

Even with a carbon price the RET may be justified as a supplementary policy if it can help to unlock cost reductions in local deployment of renewable energy that can lead to lower costs of meeting emissions reduction targets over the long term.

The Authority is continuing to seek evidence regarding the impact on the cost of renewables resulting from rate of deployment in Australia, as opposed to reductions resulting from international falls in technology costs.

3.2.2. Carbon pricing policy credibility

In Australia, climate change policy is the subject of fierce political and public debate. Uncertainty around policy and regulation can lead to less than optimal levels of innovation and investment. It can also increase the cost of any investment that does occur as well as reducing the effectiveness of existing mitigation policies.

A recent survey on the carbon price undertaken by the Centre for Climate Economics and Policy at the Australian National University found that 40 per cent of respondents think the carbon price will be repealed by 2016, however half of these respondents think it will be re-instated by 2020 (Jotzo, F., 2012). The dominant finding from the survey was a pervasive uncertainty about the future of the carbon pricing mechanism.

The Australian carbon price is expected to be determined by the price in the European Union Emissions Trading Scheme. This in turn will be influenced by a range of factors including prevailing economic conditions and other mitigation polices applying to covered sectors in Europe, including its renewable energy policy. The European carbon price is therefore also subject to uncertainty.

The current uncertainty surrounding the carbon pricing mechanism can lead to reduced investment in low-carbon technology and to making that investment more expensive. Lower or delayed investment in low emissions technology means a greater level of investment in long-lived high-carbon infrastructure. Most power generation plants have a long lifetime. The useful life of a coal-fired generator is well in excess of 30 years (IEA 2010).

The emissions implications of current and planned investments are largely irreversible for long periods. While the future emissions from current infrastructure can be avoided – through retrofitting or early retirement – such actions generally come at a high cost and may rely on unproven technologies such as carbon capture and storage.

By encouraging additional renewable energy investment, the RET reduces the extent and effect of high-emissions infrastructure lock-in due to policy uncertainty. This can reduce:

- the need to retrofit power stations;
- reliance on unproven technologies; and

- the amount of capital stock that would need to be retired early.

However, if Australia continues to see slow growth in electricity demand over the coming years, additional generation capacity will be limited and this may reduce the cost impact of locking-in additional high-carbon infrastructure.

The IEA has assessed the global costs of locking-in high-emissions energy infrastructure due to delayed investment in abatement. Under the IEA's 450 Scenario (stabilising greenhouse gases at 450 parts per million), for every $1 of avoided investment between 2011 and 2020, either through reduced low-carbon investment or adoption of cheaper fossil-fuel investment options, an additional $4.30 would need to be spent between 2021 and 2035 on additional abatement to compensate for higher emissions earlier in the period, as more low-carbon plant and equipment need to be installed (IEA 2011a).

In its submission to the Garnaut Review, the Productivity Commission made the following comments on the role of supplementary policies such as the RET when the credibility of future carbon prices is uncertain:

> *Whether a gap between the forward emissions price path envisaged by policy makers and the price path private agents factor into decision making might warrant a greater role for supplementary policies in the early years of an ETS depends in part on the reason for the discrepancy.*
>
> *If private agents think that major technological breakthroughs that will greatly lower the cost of achieving emission reductions are imminent, the gap may simply reflect the market having access to better information and no enhanced role for supplementary policies is warranted.*
>
> *If, on the other hand, the departure is due to low credibility because of a view that future governments are likely to water down or dismantle the ETS, a case for an extra role for supplementary policies during the transitional phase can be argued. (Productivity Commission, 2008, p.11)*

As also noted by the Productivity Commission, to perfectly address the uncertainty of the carbon price with supplementary policies would require the Government to know the optimal investment path and to know how firms would have responded to a more certain emissions price path. While meeting this information requirement may not be possible, the benefits of a supplementary measure may still outweigh the costs. For example, while it is not possible to know precisely the optimal investment path, it is well understood that with a carbon price consistent with global action to keep temperature rise to below 2 degrees, Australia will need a significant increase in renewable generation over the coming decades. The additional renewable generation encouraged by the RET is consistent with this.

The RET may well be justified as a transitional measure in the presence of a carbon price as it contributes to addressing the delay in investment in renewable technologies that is likely to occur in the presence of significant uncertainty about the future of the carbon price and climate change policy generally.

3.2.3. Benefits unrelated to climate change

Other arguments that have been made in Australia and elsewhere for increasing the deployment of renewable energy include:

- promoting energy security;

- avoiding some of the health and broader environmental costs associated with the production and use of fossil fuels;
- promoting retail competition; and
- creating employment.

Energy security

Energy security is frequently put forward in other countries as a reason for investing in renewable energy generation as it reduces reliance on finite, and often imported, fuels (United Kingdom Department of Energy and Climate Change, 2011) (The White House, 2011). Australia, however, has an abundance of fuel resources and does not generally import fuel for electricity generation. Australian reserves are large enough to supply us for many decades into the future (Australian Government Department of Prime Minister and Cabinet, 2004). In the Australian context, therefore, the RET does not play a role in promoting energy security through reduced reliance on imported fuels.

The Department of Resources, Energy and Tourism's National Energy Security Assessment reports on energy costs as a component of energy security:

> *In the Australian context, energy security is defined as the adequate, reliable and competitive supply of energy to support the functioning of the economy and social development, where: … competitiveness is the provision of energy at an affordable price that does not adversely affect the competitiveness of the economy and that supports continued investment in the energy sector. (Australian Government Department of Resources, Energy and Tourism, 2011, p.2)*

In the short term, renewable energy adds to the costs to society of electricity supply. Most renewable energy technologies, however, have very low running costs. Renewable energy sources, such as solar and wind, are not subject to fluctuations in world fossil fuel prices, and will also not vary with world carbon prices – once built, their ongoing running costs are likely to be much more predictable than fossil fuel power stations. Therefore, it could be argued that increasing the share of renewable energy reduces the risk of uncertain and potentially high energy costs in the future. This view is shared by the International Energy Agency:

> *Fossil energy technologies require an input fuel and are thus fully exposed to price volatility of fuels and price uncertainty. Because they do not need a fuel, renewables (hydro, solar, wind) are not exposed to these aspects. (IEA, 2011, p.12)*

Stable operating costs that are not subject to fluctuations in fuel costs and carbon prices may be of some benefit, but could not be used as a primary rationale for the RET. The market has developed a range of products to hedge against uncertainties relating to both fuel and carbon prices. Furthermore, as a net exporter of energy, Australia is likely to benefit overall from higher fossil fuel prices.

Public health benefits

Another source of benefits from renewable energy that does not relate to climate change relates to public health and broader environmental benefits.

The IEA has recognised that the deployment of renewables can lead to positive benefits for human health through displacing electricity generated by fossil fuels and thereby decreasing harmful pollutants such as sulphur and nitrogen oxides (IEA, 2011). The benefits of reducing harmful by-product pollution from fossil fuel generation were noted by the Climate and Health Alliance:

> *Reducing the burning of fossil fuels for electricity and transport can reduce the incidence of heart and lung diseases, including lung cancer, as well as neurologic disorders. (Climate and Health Alliance (Attachment), sub.18, p.2)*

As noted in the RET review issues paper, the National Health and Medical Research Council is investigating the impact of wind farms on human health. The Council is commissioning a systematic review of the scientific literature to examine the possible impacts of wind farms on human health, including audible and inaudible noise. See http://www.nhmrc.gov.au/your-health/wind-farms-and-human-health for further information.

The Authority has not attempted to quantify the relative health costs and benefits associated with renewable technologies compared with fossil fuel generation. It is the Authority's preliminary view that the RET is unlikely to be the most appropriate mechanism for reducing the negative health impacts from fossil fuel generation, and that such issues are more likely to be better addressed more directly through regulations or planning restrictions, taking into account local conditions (including limits on coal sulphur content or emissions of particulates).

Electricity retail competition

Meridian Energy Australia suggested that an additional benefit of the RET is to promote new long-term retail competition. It argues that sustainable retailers need to be vertically integrated, and that:

> *[w]ithout LRET, opportunities for generation asset investment which can be accessed by new entrant participants would be lacking. The absence of such opportunities would inhibit the ability of new entrants to participate on a sustained basis in Australia's retail market. (Meridian Energy Australia, sub.159, p.2)*

The Authority has not assessed the extent of this possible effect. While promoting retail competition is desirable, any impact that the RET has on supporting new entrants could be viewed as an unintended positive outcome, rather than a primary rationale for the scheme.

Creating employment

The IEA has recognised that an objective of renewable energy policy can be to enhance employment (IEA 2011, p.5). As shown in Chapter two, there has been a considerable increase in the number of people employed in the renewable energy sector since the commencement of the MRET. However, it is unclear whether there has been any net increase in employment as a result of the scheme.

3.3. The Authority's approach

The Authority has taken into account the changed policy environment in which the RET currently operates, as well as the significant degree of uncertainty regarding key features of that environment in the future.

The Authority is conscious of the fact that the RET is not a 'least cost' way of reducing greenhouse gas emissions and that if a carbon price remains in place and gradually rises over time, the RET would phase itself out, as certificate prices drop to zero. It has been put to the Authority in several submissions that given a carbon price is now in place that the RET is no longer justified and should be phased out.

The Grattan Institute concluded that:

> *… the policy case for the RET, to the extent it was ever valid, is no longer so. The RET does not contribute to either the efficacy or the efficiency of the ETS. In particular, the current*

energy and climate change policy framework strongly suggests that the RET is now solely a form of industry assistance. (Grattan Institute, sub.165, p.1)

The Minerals Council of Australia stated that:

… [the] RET is costly and inefficient in itself and in addition remains a contradiction to the central policy goal of a properly designed, technology-neutral, least cost emissions trading scheme which is introduced in a phased manner and aligned with international efforts. It should be removed. (Minerals Council of Australia, sub.91, p.3)

The Australian Petroleum Production and Exploration Association noted that:

… the RET is an economically inefficient policy operation that should be discontinued. (Australian Petroleum Production and Exploration Association, sub.108, p.6)

The Australian Coal Association stated that:

… [the] RET should be abolished and existing property rights (including for waste coal mine gas used in electricity generation) should be grandfathered or otherwise compensated. (Australian Coal Association, sub.82, p.7)

The Independent Pricing and Regulatory Tribunal NSW stated that:

… [in] our view, the introduction of the carbon price and a move towards an emissions trading scheme (ETS) removes the need for the RET (and ultimately electricity customers) to continue to subsidise investment in the renewable sector. The RET is not complementary to the carbon price and does not cost effectively address any other significant market failure. (Independent Pricing and Regulatory Tribunal NSW, sub.81, p.1)

The Authority also recognises that the carbon price has only just been introduced and continues to be the subject of intense political debate. This high degree of regulatory uncertainty is likely to mean that the effectiveness of the carbon price in driving investments in low emissions technologies generally, including long-lived renewable power stations, is likely to be reduced. The RET has, and appears to be continuing to play, a role in bolstering incentives for renewable investment in an environment of general uncertainty in relation to the future of a carbon price. In the current policy environment, the RET can be seen as a complement to the carbon price. Therefore the review concentrates on whether any improvements can be made to the design of the RET, rather than challenging the RETs existence.

Furthermore, the Authority is conscious that it is not starting with a blank canvas: the RET has operated now for many years and is legislated to continue to 2030. Companies have already made significant investments on the basis of that legislation and are planning on investing substantially more.

Transitioning to a clean energy future will require considerable investment over decades. A stable and predictable policy environment is crucial to fostering the confidence and certainty required for such investment. Consistent feedback from participants has highlighted the high level of policy uncertainty in the climate change policy environment and the negative impact this has on investment. Furthermore, the importance of maintaining a stable policy environment has been emphasised by many stakeholders including the Ai Group:

Many businesses have commented on the importance of providing a stable policy environment for future investment in energy generation, whether renewable or otherwise. The RET has been through several major changes in recent years, and any further adjustments need caution if they are not to reduce the credibility and reliability of energy policy as a whole. (Ai Group, sub.46, p.5)

It needs to be recognised that changes to policy can have considerable costs if the changes negatively influence the perception of regulatory risk. A strong and clear case needs to be made for any policy changes, including changes to the RET, with the benefits of such changes weighed against all likely costs, including the additional risk premium on investment and the impacts of lower innovation and lock-in of high-emissions infrastructure due to perceived regulatory risk.

Professor Garnaut recognised the importance of providing regulatory stability in his submission:

> *It remains my view that if there were certainty about the retention of economy-wide carbon pricing at economically and environmentally rational prices, it would be advisable to retain the Renewable Energy Target and to allow it gradually to be made redundant by a rising carbon price. In this set of circumstances, for reasons of business certainty, it would be wise to retain the Renewable Energy Target with the legislated parameters. Many business decisions have been made on the basis of current legislation and changes in the law increase uncertainty about the stability of future policies. Uncertainty raises the supply price of investment and the costs of electricity to users. Change in the law should not be contemplated without compelling policy reasons. (Professor Ross Garnaut, sub.167, p.2)*

The Authority recognises the costs and uncertainty associated with regulatory risk and the need to establish a clear and strong case for changes to policy. Given this, there needs to be a strong policy rationale to recommend a change and the expected benefits of any recommended change need to exceed the expected costs.

3.4. Frequency of Renewable Energy Target reviews

Currently the *Renewable Energy (Electricity) Act 2000* (Cth) *(REE Act)* requires that the Authority conducts reviews of the RET every two years (see Chapter 1 for further details).

A large number of submissions from a diverse range of stakeholders have raised concern with the current frequency and scope of reviews, arguing that it is influencing investor certainty. For example:

Pacific Hydro stated:

> *Make no changes to the Renewable Energy Target legislation except for the removal of the legislative requirement for biennial reviews. (Pacific Hydro, sub.76, p.15)*

The Australian Industry Greenhouse Network noted:

> *… the uncertainty that is likely to be caused by undue frequent reviews of the RET, despite the REE Act mandate for reviews by the Authority every two years. (Australian Industry Greenhouse Network, sub.164, p.13)*

TRUenergy considers:

> *… that any future reviews should be conducted at intervals no greater than every 5 years, providing a balance between the need to ensure the policy objectives are met and providing certainty through the framework to support investment. (TRUenergy, sub.102, p.11)*

Grattan Institute noted:

> *… this review is being undertaken following a series of significant and highly contentious reviews of the RET since its original introduction. Of particular note is the impact on investor certainty created by such reviews and other policies implemented by the Federal Government and those of several states and territories. (Grattan Institute, sub.165, p.1)*

Clean Energy Council noted:

> *… the RET has undergone regular review since its inception, each time resulting in slowing or deferment of investment. Two yearly RET reviews present the single greatest risk to the achievement of the 20 per cent target by 2020, particularly as the review is considering changes to the overall target itself and not just the operation of the RET scheme. (Clean Energy Council, sub.12, p.1)*

Investor Group on Climate Change stated:

> *… reducing the frequency of future reviews of the RET should be considered to limit the extent to which such reviews can cause uncertainty in the market and further delay investment decisions. (Investor Group on Climate Change, sub.70, p.6)*

Business Council of Australia stated:

> *… there is a risk that the frequency and short time periods between reviews will of themselves have an adverse impact on longer-term investment in energy infrastructure. (Business Council of Australia, sub.130, p.7)*

The Authority shares these concerns. Accordingly, the following options to address these concerns have been considered:

- maintain the existing time frame for reviews but narrow the scope of each review;
- extend the time frame for reviews to four years; or
- only review the scheme when and if certain conditions are met.

Under the first option, the Authority would continue to undertake reviews every two years, but narrow the scope of every second review so that it is focused only on administrative issues and eligibility of any new technologies that have emerged. For this option, more fundamental reforms, such as potential changes to targets, are only considered every four years. This approach is supported by the Business Council of Australia:

> *One way to address this is to identify now the nature of the future reviews making clear what the specific role of the review will be and matters to be considered. The BCA proposes the use of a "light touch" approach for most reviews and then specified years for matters such as the process for phasing out the RET at the end of the current legislated period (2030). (Business Council of Australia, sub.130, p.7)*

This option allows for flexibility to respond to problems that have arisen in administering the scheme at regular intervals while ensuring a degree of policy stability on more fundamental aspects of the policy framework.

The second option involves maintaining the current review scope, but undertaking the reviews less frequently, every four years. This allows flexibility to make amendments to reflect changed circumstances, but also provides policy stability and predictability. Furthermore, this option means that reviews of the scheme can be done in a holistic way and ensures that administrative and structural issues are reviewed in parallel. This approach is suggested by several submissions. For example, the Climate Institute noted that the:

> *… year 2016 should be the earliest major review and the scope should be narrowed to consideration of post-2020 design issues (e.g. expanding the target post-2020). (The Climate Institute, sub.86, p.4)*

Eraring Energy also recommended:

> *… less frequent reviews of the scheme – perhaps once in 4 years as the current biannual review creates more uncertainty leading to unnecessary investment risks. (Eraring Energy, sub.146, p.2)*

In addition, this time frame is more in accord with the Australian Government Best Practice Regulation Handbook, which recommends, as a benchmark, that reviews of regulation occur at least every five years.

The third option involves the Authority only undertaking a review if certain conditions are met. This approach has been suggested in a number of submissions, including by AGL Energy:

> *It is AGL's view that the policy should not be reviewed every two years – to do so is destructive to the efficient operation of the market. Rather than conducting a review every two years, market effectiveness would be better facilitated if the review only commenced once relevant threshold criteria were met. Such criteria would involve some type of LRET market failure which necessitated intervention. (AGL, sub.38, p.5)*

Developing review triggers based on market failures will require regular monitoring of those triggers – which is effectively an ongoing review. This option would provide less predictability about the timing of reviews and is viewed by the Authority as being unworkable.

On balance, the Authority considers that option two, full reviews every four years, will provide an appropriate balance between policy flexibility and investor certainty. It is therefore the Authority's preliminary view that reviews occur every four years with the next review occurring in 2016.

This would require an amendment to the *REE Act.* If the Government is not minded to amend the Act to reflect the proposal then the Authority proposes, subject to Government agreement, narrowing the scope of the next review, in 2014, to consider only administrative issues as they have arisen and the eligibility of any new technologies that have emerged.

Either way, the Authority anticipates that its approach to future reviews will remain consistent with the approach established for this review. That is, the Authority will consider the scheme in the policy context at the time of the review and only make changes if a compelling case can be made.

DRAFT RECOMMENDATION

R.1. The preliminary view of the Authority is that the frequency of scheduled scheme reviews be amended from every two years to every four years, so that the next review would be in 2016.

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CHAPTER 4. THE LARGE-SCALE RENEWABLE ENERGY TARGET

This chapter considers the form and level of the Large-scale Renewable Energy Target. It examines the implications of maintaining the existing target. The chapter also assesses the appropriateness of potential changes to the current arrangements.

The Renewable Energy Target (RET) currently comprises two components – the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). This chapter focuses on the LRET, which has a legislated target of 41 000 gigawatt hours (GWh) for the period 2020 to 2030 (with interim targets to 2020).The targets are set in legislation and each certificate generated under the LRET represents one megawatt hour of renewable energy generation.

The level and the form of the target are key design features of the RET scheme. The Authority has considered whether the target will be met in the context of current settings and has assessed the implications of potential changes. A number of participants have put forward the value of maintaining the current target, while others have advocated for change. The changes proposed by some stakeholders are broadly:

- a reduction in the target to reflect downward revisions to electricity forecasts; and
- an increase in the target to take into account renewable energy projects that will be funded by the Clean Energy Finance Corporation (CEFC).

The Authority considers that any benefits associated with changing the level of the target would need to outweigh the costs which would include any heightened perception of regulatory risk and associated project risk premiums.

This chapter discusses the following issues:

- the evolution of the level of the renewable energy target and the implications of lower electricity demand forecasts (section 4.1);
- the implications for maintaining the current LRET target including whether it can be met (section 4.2); and
- alternative target settings, including:
  - reducing the target to account for lower electricity demand forecasts (section 4.3.1); and
  - increasing the target, principally to ensure projects funded by the CEFC are additional to those likely to emerge from the existing LRET (section 4.3.2).

To help inform its thinking on these issues, the Authority commissioned SKM MMA to undertake electricity market modelling to examine the implications of maintaining, or changing, the existing LRET (see Box 4).

Box 4 Modelling

The Authority engaged SKM MMA to undertake electricity market modelling to assess the effects of making potential changes to the current LRET on generation capacity mix and production, abatement, certificate prices, resource costs, wholesale and retail electricity prices and power bills for the average household. There are a number of key parameters that influence the performance of the RET in the future, including:

- the structure of the scheme; and
- forecasts of the carbon price, energy demand, technology costs and fuel costs.

The modelling period for the analysis was from 2013 to 2040 to ensure investments which are forecast to occur following 2020 take into account future revenues over the life of the investment. Reporting of results in this chapter focuses on the period 2013 to 2030.

Four future RET settings were considered:

- existing LRET target;
- no RET from January 2013 onwards;
- updated 20 per cent target of 26 400 GWh in 2020 for large-scale renewable generation to reflect downward revisions to long term electricity demand forecasts, allowing for around 11 000 GWh for the contribution of small-scale renewable technologies; and
- rolling the LRET and SRES back into one target of 45 000 GWh from 1 January 2015.

SKM MMA's modelling outcomes are generally presented on a financial year basis, although the renewable energy targets are legislated on a calendar year basis. Therefore, when assessing whether the model achieves a target for the 2020 calendar year, a check is made against the 2020-21 financial year results. Likewise, when assessing whether the model achieves a target for the 2030 calendar year, a check is made against the 2030-31 financial year results.

All values from the modelling are denominated in June 2012 prices.

Where a net present value is provided, a discount rate of 7% has been used.

As with any modelling exercise, the modelling results are dependent on the assumptions used.

The SKM MMA modelling report outlines the key assumptions in the modelling and is available at www.climatechangeauthority.gov.au.

4.1. Background

The original Mandatory Renewable Energy Target (MRET) of 9 500 GWh was intended to represent an additional 2 per cent renewable energy generation beyond what would otherwise have been in place by 2010. By 2002, electricity demand was growing more rapidly than had been assumed at the time that the original 9 500 GWh target was set, prompting some to call for an increase in the gigawatt hour target to match the stated policy intention of delivering an additional 2 per cent in renewable energy. This issue was considered in the 2003 Tambling Review of the MRET, which concluded:

> *The Review Panel [is] convinced … that any future target should continue to be expressed in terms of a fixed GWh level. By their nature, projections of electricity demand contain a degree of uncertainty. The changes in projected electricity demand that have occurred since the*

MRET was announced demonstrate that a percentage-based target would require the corresponding generation level to be regularly revised. This would adversely impact on market certainty. Risk is a key factor in investment decision making, so that any changes to MRET that would reduce market certainty would also reduce the prospect of attracting the required financial backing for projects. The Review Panel considers that a fixed target is more compatible with market certainty, with MRET's industry development objective, which defines a level of renewable energy generation rather than a percentage of a fluctuating electricity market over which the industry has no control. (MRET Review Panel, 2003, p.119-120)

In the 2007 Commonwealth election campaign a commitment was made to expand the then MRET. The commitment was variously stated as '20 per cent of Australia's electricity supply will come from renewable sources by 2020' and 'the equivalent of at least 20 per cent of Australia's electricity supply will come from renewable sources by 2020' (20 per cent by 2020 commitment).

The 20 per cent by 2020 commitment was initially translated into a legislative target of 45 000 GWh of renewable generation for the period 2020 to 2030 (with interim targets to 2020). In 2010, the RET was split, the initial target for renewable generation was revised to 41 000 GWh in 2020 (through to 2030) for the LRET and an uncapped amount, notionally allocated at about 4 000 GWh, for the SRES.

The 45 000 GWh value was expected to deliver around 20 per cent renewable energy based on a 2007 forecast of electricity demand in 2020 and the inclusion of renewable generation already operating prior to the introduction of the MRET (for further discussion see Box 5). At the time, it was estimated that the RET would ensure that almost all of the growth in electricity demand would be met by renewable energy and, therefore, would not displace existing generation.

In June 2012, the Australian Energy Market Operator (AEMO) published new long-term electricity demand forecasts that represent a substantial downward revision to the level of electricity demand previously expected (See Figure 20). AEMO's medium scenario forecasts indicate that by 2020-21, electricity demand in the National Electricity Market would be 219 573 GWh – noting this does not include Western Australia, Northern Territory or off-grid generation. Interestingly, these recent forecasts are similar to the electricity demand modelled by the Treasury in *Strong Growth, Low Pollution: modelling a carbon price 2011*.

Figure 20 AEMO revisions to long term forecasts of NEM electricity demand

Source: Australian Energy Market Operator 2012, *National Electricity Forecasting Report (NEFR) 2012*, viewed June 2012, <http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/National-Electricity-Forecasting/National-Electricity-Forecasting-Report-2012>.
Note: NEFR 2012 projections are the most recent. ESOO projections refer to previous forecasts published in the 2011 Electricity Statement of Opportunities (ESOO). The low, medium and high scenarios reflect different assumptions regarding (among other things) economic growth, the effects of energy efficiency measures and uptake of household solar photovoltaic (PV) technology.

Several factors appear to be affecting current levels of electricity demand – some of these are permanent and structural, while others may be cyclical. Relevant factors include:

- lower industrial activity, particularly in manufacturing, than previously forecast;
- a user response to significant increases in retail electricity prices;
- the increase in penetration of household solar PV;
- the effects of energy efficiency programs and regulation (such as the home insulation program, the banning of incandescent light bulbs, changes in building standards, mandatory appliance standards); and
- the relatively mild summer weather over the past two years.

Importantly, the way that electricity demand is calculated has implications for the calculation of the percentage of renewable energy delivered in any given year. For the purposes of forming estimates of the percentage of renewable energy delivered, the Authority's modelling estimated "native demand", which is a measure of the energy required to meet all customer load including that serviced by rooftop solar PVs, embedded generation and network losses.

The percentage of renewable energy forecast to be delivered in 2020 under current settings is discussed in further detail in Box 5 (p.52).

4.2. Implications for maintaining the existing 41 000 GWh target

This section examines:

- whether the existing target is likely to be met; and
- the results and key findings of electricity market modelling commissioned by the Authority in relation to maintaining the existing LRET target with respect to:
  - generation capacity mix and production;
  - resource costs;
  - emissions;
  - certificate prices;
  - wholesale and retail electricity prices; and
  - electricity bills for the average household.

4.2.1. Can the current target be met?

Several submissions to the review commented on whether the existing LRET target can be met.

Some participants have expressed a view that the market does not have sufficient capability to deliver the current target by 2020. Their concern relates to the physical ability to build renewable generation within the required timeframes, given, in their view, potential constraints on the availability of relevant equipment, materials and expertise. For example, Origin Energy pointed out that:

> *… the expansion required in each year beyond 2016 represents several multiples of what has historically been achieved in any prior year. This totals about 9,000 MW over a four year period, or over 2,000 MW per year – compared to about 2,000 MW over the past decade. (Origin, sub.69, p.6)*

Australian Industry Group has stated:

> *… while the existing targets have been easily met, it will be challenging to approve, construct and commission sufficient new capacity to meet the 41,000 GWh target in just eight years. (Australian Industry Group, sub.46, p.8)*

Alinta Energy notes:

> *As an aside, it has also been suggested that, regardless of the reduction in demand, the ability to build the amount of transmission investment required to connect 45,000GWh of renewables by 2020 is not feasible. (Alinta Energy, sub.89, p.4)*

There has been an acknowledgement that an oversupply of certificates and subsequent low large-scale generation certificate prices have limited investment in renewable generation in the past few years. Bloomberg New Energy Finance (2012a) estimates that the market will contain sufficient banked certificates to satisfy surrender requirements until the beginning of 2016. Nonetheless, stakeholders have indicated that the current targets can be met. For example, RATCH-Australia Corporation has stated:

> *The electricity industry has been able to meet the requirements of the RET to date and RAC expects that the industry will be able to meet requirements to 2020. (RATCH-Australia Corporation, sub.134, p.2)*

The Clean Energy Council states:

> *In terms of future investment, there is a significant pipeline and drivers for increased deployment that can all ensure the 20 per cent target is ultimately achieved. (Clean Energy Council, sub.12, p.9)*

On the basis of information published by AEMO, if only a proportion of the publically announced project pipeline for wind farms in the National Electricity Market were converted into delivered energy, the current LRET target would still be met (see Table 1). Projects in Western Australia and the Northern Territory are additional to the list below.

Table 1 Publicly announced wind energy projects listed by AEMO

State	Publically announced projects (approximate capacity only)
Queensland	1 769 MW
New South Wales	5 097 MW
Victoria	3 624 MW
South Australia	2 607 MW
Tasmania	330 MW

Source: Australian Energy Market Operator 2012, Generation Information, viewed October 2012, <http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information>.

This view is shared by WindLab Systems, which provided their own estimate of the project pipeline for wind projects and stated:

> *… 'Approved' wind is not far off being able to supply the whole target and projects actively seeking approval (Permitting) well exceed the target. (WindLab Systems Pty Limited, sub.63, p.4)*

Large-scale renewable projects take a number of years to plan and build and thus the timing of investment decisions and project commissioning is critical to meeting the target. Samsung C&T Corporation states:

> *Any further delays or deviations away from the already aggressive construction schedule needed to meet the current trajectory will almost certainly result in its [the target] not being met due to constraints in resources needed to deliver projects. (Samsung C&T Corporation, sub.11, p.3)*

Hepburn Wind suggests that a large number of projects will need to be built in the next couple of years:

> *Construction of generation infrastructure generally takes 5 −10 years from conception to commissioning. With increasing expectations for community engagement and less supportive planning environments, project timelines are getting longer. As such it is likely that the vast majority of projects required to reach the 2020 target will need to be in development in the next year or two. (Hepburn Wind, sub.56, p.3)*

Some participants' have argued that the principal threat to meeting the target is continuing uncertainty over the target, stemming from a history of policy change and ongoing scheme reviews. For example, the Grattan Institute has noted that the target should be met *provided* the prospect of uncertainty is dealt with:

> *The process of RET reviews and the approach of the 2020 target date have contributed to uncertainty and therefore to the question of whether the target can be delivered. If such uncertainty was removed and the Government clearly re-committed to the target then there is no fundamental reason why the target should not be achieved. (Grattan Institute, sub.165, p.2)*

The effects of state planning regulations were also raised as a barrier to renewable generation, predominantly wind. For example the Energy Supply Association of Australia comments that:

> *The restrictions placed on wind projects and long-standing opposition to building new dams may also be a factor in the coming years. The esaa is certainly not arguing that the RET should be changed because of these planning regimes. On the contrary, it is partly because of these planning regimes that the existing target will be difficult and costly to reach. (Energy Supply Association of Australia, sub.110, p.4)*

Modelling commissioned by the Authority takes into account the current planning arrangements in different jurisdictions, including those affecting the siting of wind farms. As discussed below, this modelling estimates that the current targets are likely to be met (so long as a carbon price does not approach zero). However, planning arrangements have the potential to alter the mix and cost of projects that are undertaken. The Authority therefore considers there may be value in the Standing Council on Energy and Resources examining the implications for national energy markets of the current planning regimes.

4.2.2. Authority modelling and analysis of the existing 41 000 GWh target

As part of the electricity market modelling commissioned by the Authority, SKM MMA estimated the impacts of maintaining the existing LRET target (*reference case 1* scenario) on:

- the generation capacity mix and production;
- resource costs;
- emissions;
- certificate prices;
- wholesale and retail electricity prices; and
- electricity bills for the average household.

Reference case 1 assumptions

Key modelling assumptions for the *reference case 1* scenario include:

- AEMO medium growth energy forecast;
- a carbon price path reflecting a fall in prices after the fixed price period;
- small-scale renewable technology penetration of around 11 000 GWh by 2020;
- a Small-scale Technology Certificate price that averages around $30 per megawatt hour over the period 2012 to 2020; and
- minimal network constraints (restrictions on power flows) within a state and development of interconnectors between state systems on the basis of market-wide economic assessment of benefits and costs.

A scenario where there is no RET from 1 January 2013 (*no RET*) was also modelled to explore the effects of the existing target. Key comparisons between the *reference case 1* and *no RET* modelling outcomes are provided in the discussion below.

Section 4.3.1 outlines the estimated effects of moving from *reference case 1* to a lower target of 26 400 GWh (*updated 20% target*) that reflects downward revisions to long term electricity demand forecasts.

Generation capacity and production

The RET can have two key implications for the source of electricity generation.

First, delivering new generation capacity could have the effect of displacing incumbent generation. This is most likely where there is not enough growth in electricity demand to account for the new renewable generation encouraged by the RET.

Second, the low marginal cost of renewable energy projects means that, when their generation is available, they have the ability to bid into the market (where required) at a lower price and thus are dispatched in preference to other generators.

Comparing reference case 1 with a no RET scenario reveals that over the period 2013 to 2030 there is a similarity in the level of development in new generation (see Table 2). However, the existing target tends to accelerate the build of new renewable energy generation (primarily wind-powered) when the carbon price is insufficient to make the development of new renewable energy generation economically viable. By the end of the 2020-21 financial year, it is estimated that around 27 000 MW of renewable energy generation capacity will be installed in total compared with around 18 400 MW under the *no RET* scenario.

Table 2 New generation build from 2012-13 to 2030-31 under reference case 1 scenario and no RET scenario (MW)

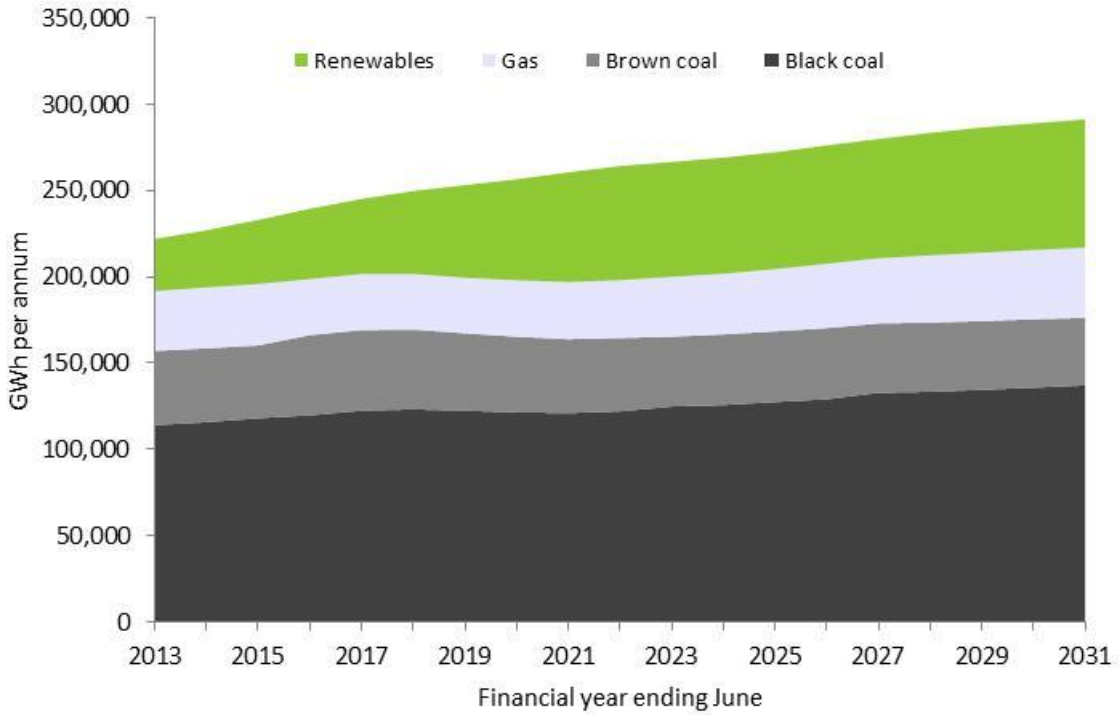
	Reference case 1	No RET from January 2013
Renewable generation	18 185 MW (13 636 MW by 2020-21)	17 788 MW (5 499 MW by 2020-21)
Gas-fired generation	5 113 MW	4 854 MW
Coal-fired generation	24 MW	24 MW

Figure 21 presents an overview of generation in gigawatt hours by broad fuel category and shows the increasing share of generation captured by renewable technologies. As a share of total generation, it is estimated that renewable energy generation (including an allowance for displacement technologies) contributes around 15 per cent in 2012-13, growing to around 25 per cent in 2020-21 and around 26 per cent in 2030-31 under the *reference case 1 scenario*. By comparison, under the *no RET* scenario it is estimated that renewable energy generation (including an allowance for displacement technologies) contributes around 14 per cent in 2012-13, around 16 per cent in 2020-21 and around 26 per cent in 2030-31.

Under *reference case 1*, in the period from 2012-13 to 2030-31, output from black-coal fired generation is estimated to increase by around 24 000 GWh (approximately 18 per cent of black coal-fired generation in 2030-31) while brown-coal fired generation is expected to decrease by around 4 600 GWh (approximately 11 per cent of brown coal-fired generation in 2030-31). Coal-fired

generation remains relatively competitive with gas-fired generation over this period as real gas prices in the southern and eastern states are assumed to double by 2030 as they approach international price-parity levels. Brown coal-fired generation capacity is not estimated to change substantially until after 2030, when retirement of some brown coal-fired generation is anticipated.

Figure 21 Total generation production mix under reference case 1 (GWh)



Estimating the contribution of renewables in 2020 under the *reference case 1* scenario is sensitive to assumptions for key parameters. Box 5 sets out SKM MMA's key assumptions and compares them with those applied in other modelling exercises.

Box 5 Estimating the contribution of renewable energy

Estimates of the proportion of electricity supplied by renewable generation in 2020 vary depending on the definitions used and the projections made of the various components. In particular, it is important to specify the total supply definition that is used and the projections of future renewable energy generated.

When the initial 20 per cent by 2020 target was translated to a fixed gigawatt hour amount in 2007, the following market expectations were relevant:

- Australia-wide demand of around 300 000 GWh in 2020;
- pre-existing hydro generation of 15 000 GWh per year; and
- new renewable energy target of 45 000 GWh per year by 2020.

This translates to a total renewable energy contribution of 60 000 GWh per year (or 20 per cent of demand) by 2020.

SKM MMA has modelled the following market outcomes in 2020-21:

- Australia-wide native demand (including generation by solar PV) of 260 645 GWh;
- pre-existing hydro of 14 000 GWh per year reflecting a downward revision of the long term energy capability; and
- new renewable energy delivery (LRET plus SRES) of 51 885 GWh.

This translates to a total renewable energy contribution (including deemed generation displacement by solar water heaters) of 65 885 GWh (or 25 per cent of native demand) by 2020-21.

This differs from the modelling undertaken by some participants. For example, Stanwell and the Australian Industry Greenhouse Network suggest that renewable energy will be more than 20 per cent of supply and Alinta Energy suggests it could be up to around 30 per cent of supply. Energy Australia (formerly known as TRUenergy) and Origin Energy suggest that in the absence of any change to LRET policy, renewable energy will represent 26 per cent of supply in 2020 based on modelling by ACIL Tasman for Energy Australia. The ACIL Tasman modelling was based on the following assumptions (as understood by the Authority):

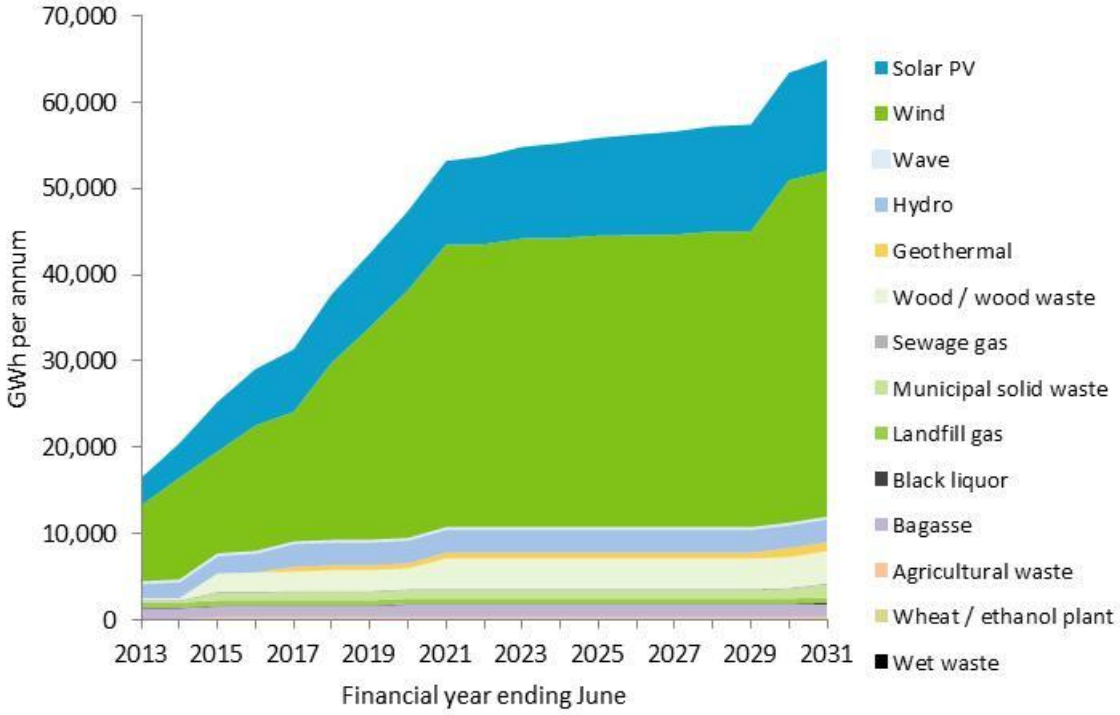
- Australia-wide relevant acquisitions of around 248 000 GWh in 2020;
- existing renewable energy baseline of 16 584 GWh per year;
- LRET contribution of 41 000 GWh per year by 2020; and
- SRES contribution of around 10 000 GWh per year by 2020.

This translates to a total renewable energy contribution of 67 584 GWh per year (or 27 per cent of relevant acquisitions, slightly higher than the number quoted by Energy Australia, that was referencing a per cent of supply) by 2020.

Figure 22 provides an estimate of the share of generation delivered by eligible renewable energy plant of different technology types. It shows that most of the additional renewable energy is likely to come from wind-powered generation (30 577 GWh in 2020-21), with a smaller contribution from solar PV (9 730 GWh in 2020-21. Even though the carbon price is assumed to be increasing, large-scale renewable generation does not substantially change its output over the period from 2020 to 2029 due to the absence of support for further new renewable generation from the RET – the target having been

met in 2020. In addition, according to the assumptions used in this modelling exercise, geothermal remains uncompetitive on a costs basis with other forms of renewable energy, even if geothermal energy development sites were to overcome current technical impediments. Solar water heating is treated in the modelling as an offset to demand, but there is no expectation that its contribution would change significantly from its existing contribution in the period to 2030.

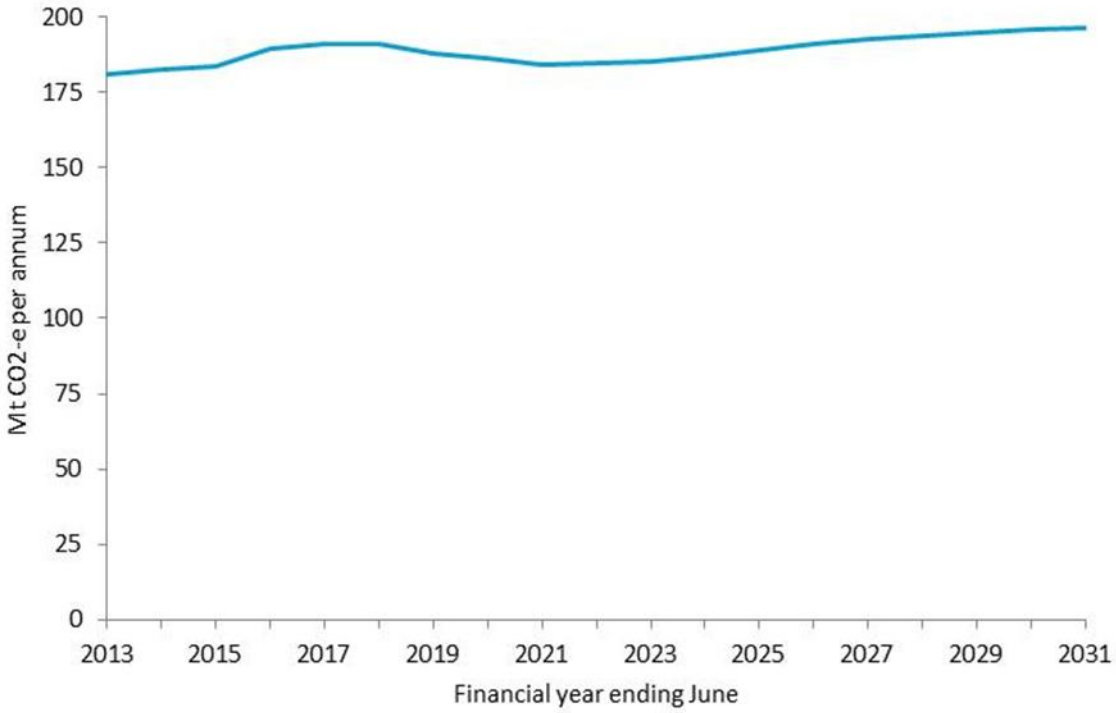
Figure 22 New renewable generation production mix under reference case 1 (GWh)



Emissions

Total emissions over the period 2012-13 to 2030-31 are estimated to be around 3 586 Mt of carbon dioxide equivalent under the *reference case 1* scenario (see Figure 23). It is estimated that emissions will fall over the period 2018-19 to 2020-21 reflecting increased wind-powered generation displacing existing fossil fuel-fired generation. Notwithstanding the reduction in annual emissions between 2018-19 and 2020-21, annual emissions are estimated to increase by 9 per cent over the period from 2012-13 to 2030-31. The growth in emissions occurs because renewable generation levels are stable from 2020-21 (the target having been met as noted above) and fossil-fuelled generation meets any electricity demand growth through the remainder of that decade. By comparison, under the no RET scenario, total emissions over the period 2012-13 to 2030-31 amount to around 3 801 Mt of carbon dioxide equivalent.

Figure 23 Annual stationary electricity sector emissions under reference case 1



Resource costs

The RET affects the cost of resources (capital, fuel and labour) deployed in electricity generation. Nonetheless, it is likely that in the absence of a RET, capital and operational expenditure on other generation sources will be required. Therefore to understand the RET's effect on the overall cost to society the estimated resource costs with and without the RET are relevant.

The new renewable and gas-fired capacity installed over the period 2012-13 to 2030-31 to meet LRET obligations and electricity demand requirements is estimated to come at a total resource cost of around $116 billion in net present value terms – noting that total resource costs represent annualised capital expenditure plus change in overall system operating costs including reductions in fossil fuels used. Under the *no RET* scenario, total resource cost (annualised capex plus opex) over the period 2012-13 to 2030-31 is estimated to be around $109 billion in net present value terms.

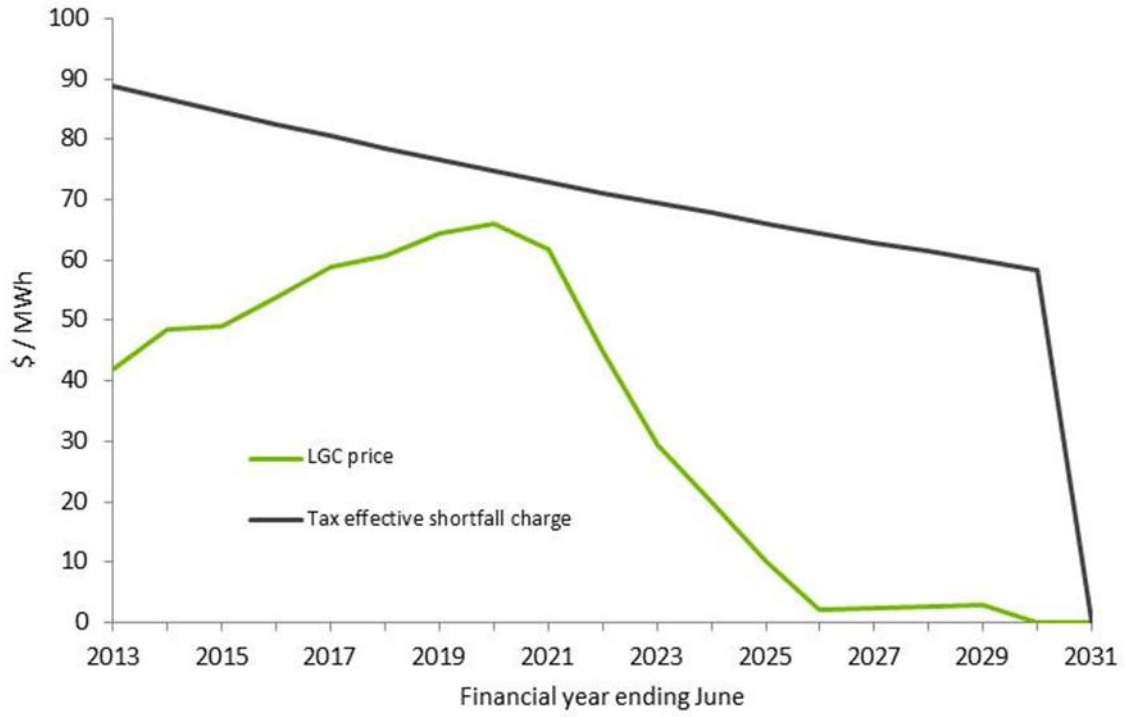
Certificate prices

The price of a large-scale generation certificate (LGC) is broadly the difference between the wholesale cost of electricity and the additional revenue required to make additional renewable energy generation a financially viable prospect. Bloomberg New Energy Finance (2012) has estimated the LGC price currently required to build new capacity, predominantly wind, is around $40 to $50. A large number of LGCs are, however, traded outside the spot market in (confidential) power purchase agreements and the effective price of the LGCs is unknown.

The LGC price under the *reference case 1* scenario is estimated to remain below the shortfall charge for the entire period between now and 2030-31 (see Figure 24). The shortfall charge is currently not indexed, and its real value falls over time in line with inflation (see Chapter 6 for the Authority's preliminary views on the level of the shortfall charge). The LGC price is forecast to approach the tax-effective shortfall charge by 2020-21, reaching $62 in that year, as higher cost renewable energy projects need to be developed to meet the annual targets.

It is estimated that all of the new renewable generation capacity required to meet the targets until 2030 would be built by 2020-21. Although there is no substantive change in large-scale renewable generation from 2020-21 to 2029-30, other market forces (e.g. rising carbon prices, falling technology costs and high gas prices) are estimated to help create an environment where renewable energy development is approaching financial viability of its own accord from 2030-31 onwards.

Figure 24 LGC price and shortfall charge



Electricity prices

There are two relevant electricity price effects of the RET.

First, the RET can affect wholesale electricity prices – that is, the price at which electricity is delivered from the generator to the wholesale market. The RET causes extra generation capacity to enter the market , changing the demand-supply balance, which can dampen prices. The fact that most renewable generation power stations have very low operating costs adds to this effect. Renewable generation driven by the RET has a low marginal cost and thus when generation is available has the ability to bid into the market at low to no cost. As a result renewables are deployed and higher cost generation is displaced. This is called the merit order effect. While lower wholesale prices can be of benefit to consumers, they represent a disadvantage to generators, whose revenues are reduced.

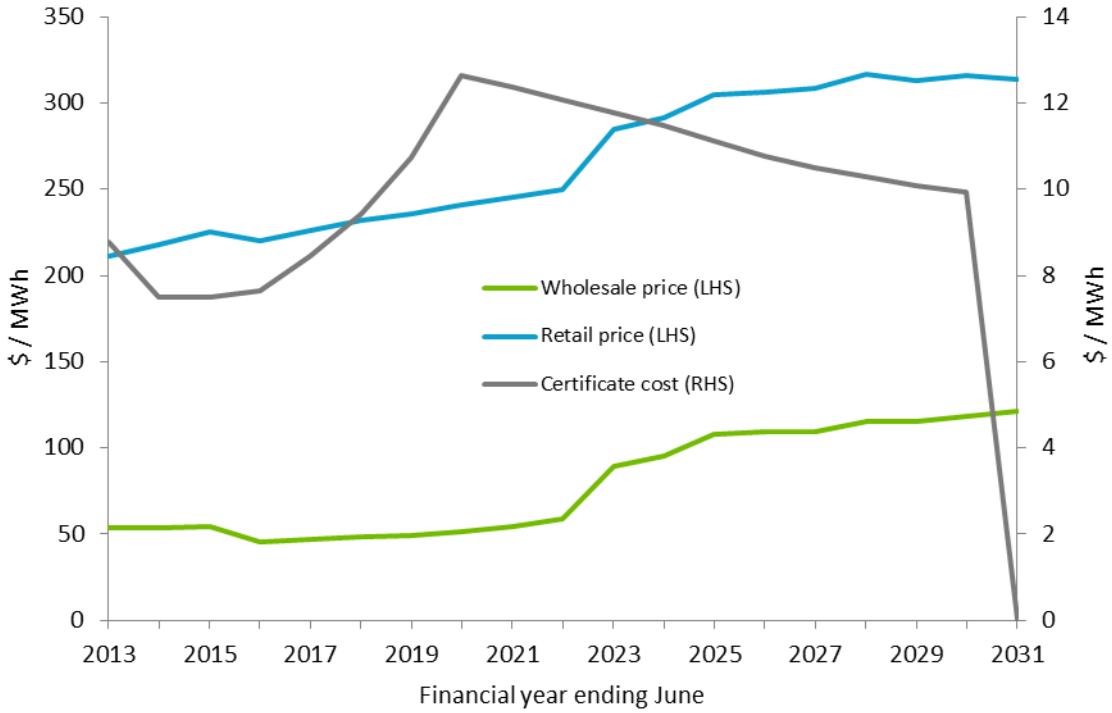
The components of the retail price as modelled are pass-through of:

- wholesale prices;
- network charges (which are assumed to represent a fixed cost with some escalation in some states based on anticipated increases);
- certificate costs (a proportionate share of LGC and STC costs borne by liable parties); and
- a retail margin.

All other things being equal, modelling conducted by the Authority estimates that the higher the large-scale renewable energy target the greater will be the increase in renewable energy development and the lower will be the wholesale price. At the same time, however, there will be a greater number of renewable energy certificates created. The net effect on all energy consumers (business and households) will therefore reflect the balance of change in wholesale electricity costs and change in certificate costs.

Over the period 2012-13 to 2030-31, volume weighted average wholesale electricity prices under the *reference case 1* scenario are estimated to rise from $54/MWh to $121/MWh. Wholesale prices are held down by the introduction of substantial volumes of low marginal cost renewable energy (see Figure 25), although there is a substantial upward shift in prices from 2021-22 to 2022-23 ($59/MWh to $89/MWh) as a result of the assumed step change in carbon prices that is assumed to occur at that time.

Figure 25 Wholesale and retail prices and RET certificate costs under the reference case 1

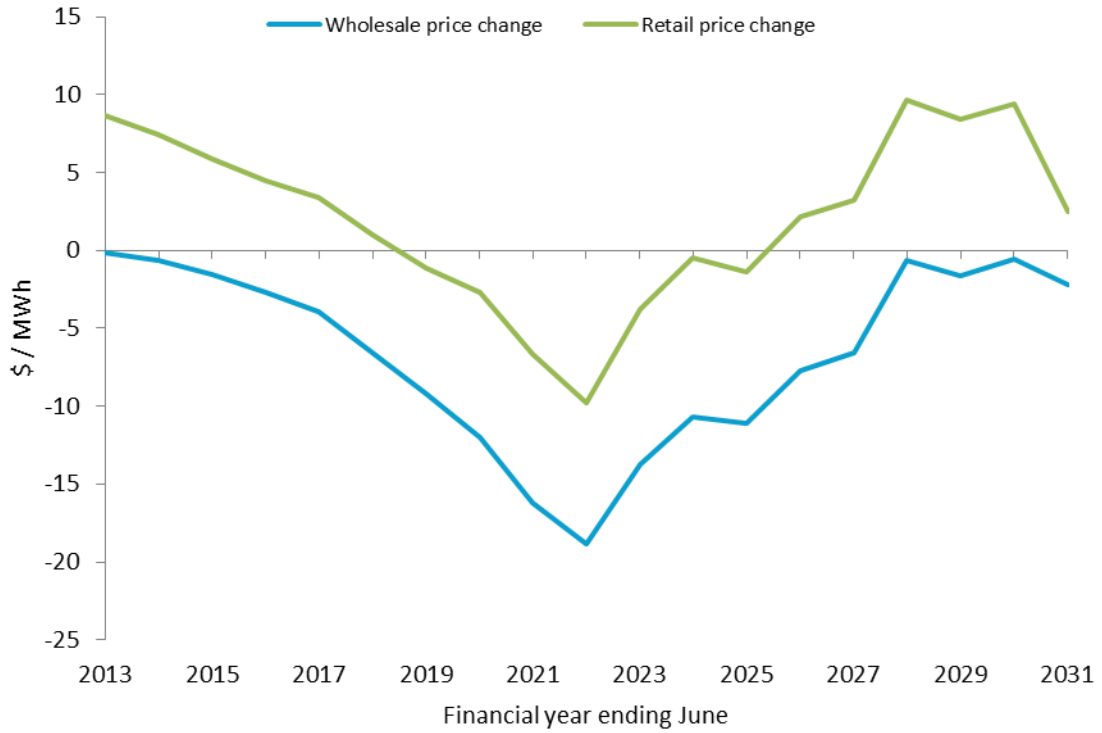


Overall movements in wholesale and retail prices are quite similar under the *reference case 1* scenario, although the margin between them grows slightly because of:

- growth in RET certificate costs to 2020; and
- expectations of slight growth in network charges.

The expected differences in the wholesale and retail prices between the *reference case 1* and *no RET* scenarios indicate that with a RET in place, wholesale prices are lower under the *reference case 1* scenario but retail prices are higher, reflecting the wedge created by the pass-through of certificate costs (see Figure 26).

Figure 26 Change in wholesale and retail prices – no RET compared with reference case 1 ($/MWh)*



* A positive number indicates the value is higher in the *reference case 1* scenario than in the *no RET* scenario.

Energy consumer effects

RET certificate costs are estimated to contribute an average of 3.7 per cent of the total costs of electricity over the period to 2030-31, which equates to around $10/MWh for every energy consumer or around $68 per annum to the volume weighted average household bill (see Table 3 and Table 4). Higher RET costs in the *reference case 1* scenario compared to the *no RET* scenario are estimated to be largely offset by lower wholesale prices under *reference case 1*.

Table 3 Retail prices

		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Average retail price	*Reference case 1*	$266/MWh	$228/MWh	$300/MWh
	No RET	$264/MWh	$226/MWh	$298/MWh
RET cost contribution to *reference case 1* retail prices		$9.74/MWh	$9.58/MWh	$9.88/MWh
		3.7%	4.2%	3.3%

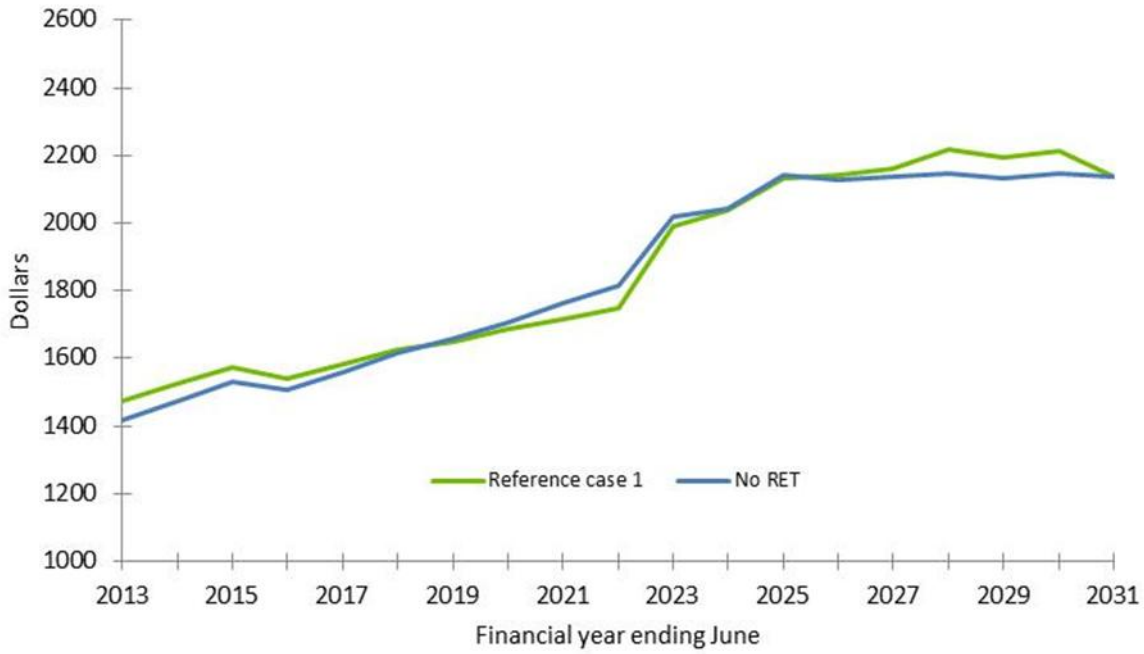
Table 4 Average annual household bill*

		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Absolute value (average $ per annum)	*Reference case 1*	$1 864	$1 598	$2 103
	No RET	$1 849	$1 582	$2 089
RET cost contribution to *reference case 1* household bill		$68	$67	$69
		3.7%	4.2%	3.3%

* Assumes average household consumes 7MWh per annum.

The average household power bill is estimated to rise through to 2030-31 at an annual average rate of 2.2 per cent under the *reference case 1* scenario (see Figure 27). The sharpest rise coincides with the step change from 2021-22 to 2022-23 in the modelled carbon price. The plateau in average household bills from 2024-25 reflects the lower level of RET certificate costs.

Figure 27 Household bills under the reference case 1 and no RET scenarios



Comparing estimated average household bills under the *reference case 1* and *no RET* scenarios reveals generally higher household bills under the *reference case 1* scenario equating to a difference of around $170 in net present value terms over the period from 2012-13 to 2030-31.

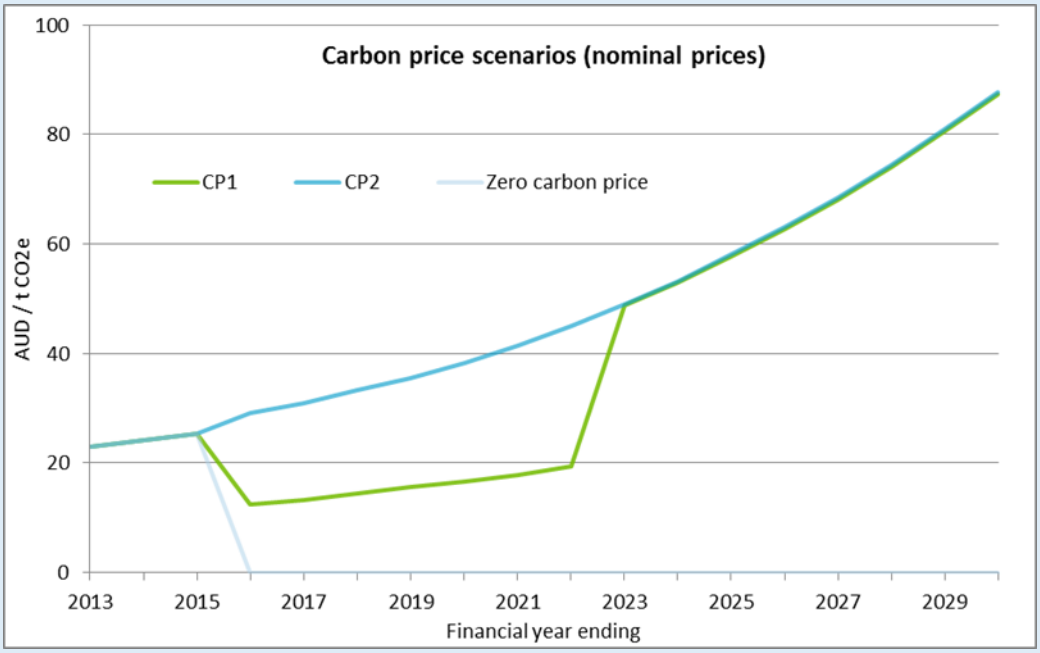
4.2.3. The implications of a change in either carbon price or demand

The modelling results for the *reference case 1* scenario are sensitive to assumptions regarding future carbon prices and electricity demand. Box 6 sets out the carbon price assumption used in the Authority's modelling.

Box 6 Modelled carbon price scenarios

The Authority has drawn on two of the Treasury carbon price scenarios published in *Strong Growth, Low Pollution: modelling a carbon price 2011* (SGLP) as points of reference for its modelling.

These two scenarios used by the Authority reflect a domestic carbon price scheme both starting at $23 per tonne of CO_2-e from 1 July 2012 with the price rising each year, before moving to two different price paths from 1 July 2015. The Authority also modelled a zero carbon price scenario.



Note: The above carbon price scenarios are not a forecast of the expected future carbon price path.

The three scenarios used by the Authority are:

- **CP1 (Reference case 1)** – Combines the Treasury SGLP update $23 scenario and Treasury SGLP 'low starting price' scenario. This scenario assumes a nominal domestic starting price of $23 per tonne of CO_2-e in 2012-13 rising on average 2.5 per cent per year plus inflation over three years. The scenario assumes a transition from this price path to a fixed price of around $12 per tonne of CO_2-e in 2015-16 (this fixed price is consistent with the Treasury SGLP 'low starting price' scenario). The 'low starting price' scenario was part of a sensitivity analysis that the Treasury ran in its SGLP modelling exercise and assumes a domestic starting fixed price of $10 per tonne of CO_2-e in 2012-13 rising 5 per cent per year plus inflation over a fixed price period of ten years. This Treasury scenario assumes a transition from a fixed price of around $19 per tonne of CO2-e in 2021-22 to an internationally linked domestic scheme which reflects the world price projected to be around $49 per tonne of CO2-e in 2022-23.
- **CP2 (Reference case 2)** – Assumes a world with a 550 ppm stabilisation target and an Australian emissions target of 5 per cent cut on 2000 levels by 2020 and 80 per cent cut by 2050. This assumes a nominal domestic starting price of $23 per tonne of CO_2-e in 2012-13, rising 2.5 per cent per year, plus inflation, before moving to a flexible world price from 2015-16, projected to be around $29 per tonne of CO_2-e. This scenario was published by the Treasury in the SGLP update.
- **CPO (Zero carbon price)** – Assumes a nominal domestic starting price of $23 per tonne of CO_2-e in 2012-13 rising on average 2.5 per cent per year plus inflation over three years, falling to zero in from July 2015.

Higher paths for either the carbon price or electricity demand than those modelled in the *reference case 1* scenario are not expected to affect the ability of the market to deliver the existing LRET target because:

- higher carbon prices would create greater incentive for renewable energy development, as renewable energy projects would become more financially viable in comparison to more emission intensive alternatives; and
- higher levels of demand would diminish the likelihood of renewable generation displacing existing generators, thereby placing upward pressure on wholesale electricity prices and increasing the value of power purchase agreements used to underwrite renewable generation.

The Authority's modelling also explored whether the target is likely to be met if the carbon price fell to zero (*zero carbon price* scenario) or if demand was significantly lower than currently anticipated (*low demand* scenario). If either the carbon price went to zero or electricity demand fell further than is currently anticipated by AEMO, then there is a greater likelihood that the LRET target would not be met because overall wholesale prices would be lower, requiring higher certificate prices for renewable energy projects to be viable.

Figure 28 LGC prices vs. shortfall charge under alternative scenarios

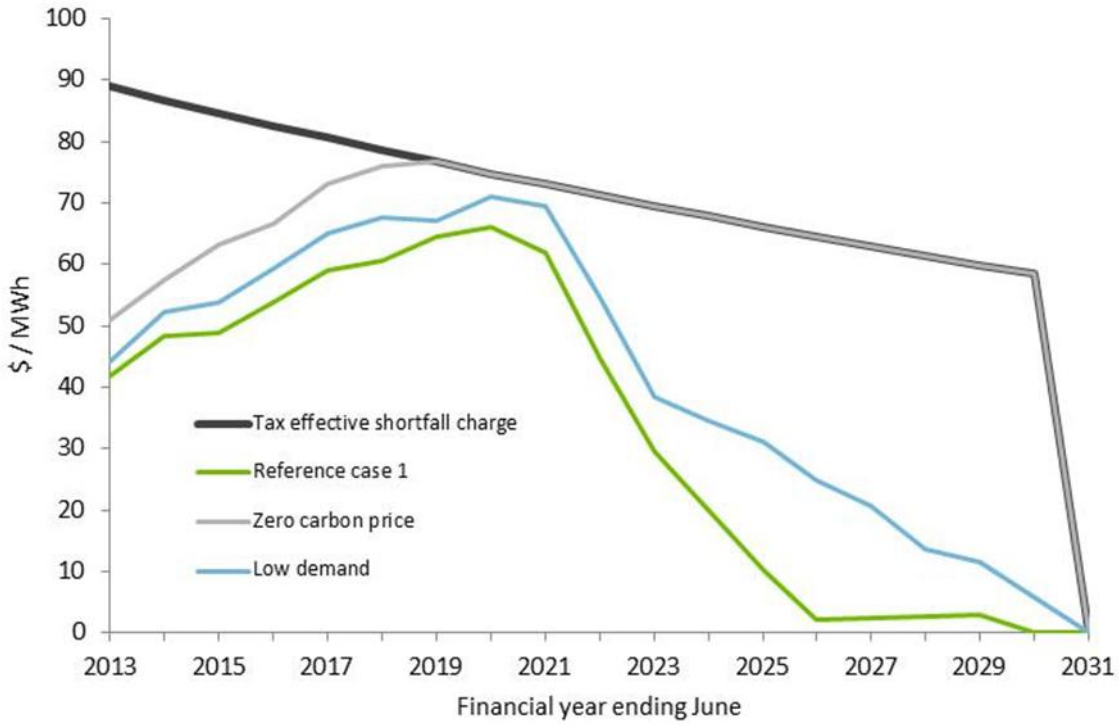


Figure 28 shows:

- the shortfall charge is estimated to come into play in the *zero carbon price* scenario, in which case the LRET would not be met as liable parties are likely to pay the shortfall charge rather than meet their LRET obligations – a result that is consistent with the findings of other modelling exercises (e.g. AEMC 2011); and

- in the *low demand* scenario the LGC price is estimated to remain below the shortfall charge, although in 2020-21 the LGC price (at $69.49) comes close to reaching the shortfall charge (of $72.99).

Comprehensive modelling results from the *zero carbon price* and *low demand* scenarios are included in SKM MMA's report.

4.3. Alternative target settings

There are two changes to the target that some stakeholders have proposed:

- reduce the target primarily due to lower electricity demand; or
- increase the target mainly to cater for the effects of additional renewable energy projects that might be financed with the assistance of the CEFC.

These are considered in detail in the Sections to follow.

4.3.1. Reduce the target

Several participants have argued that the current LRET target should be reduced. The reasons cited in support of this view include:

- to ensure that the scheme does not deliver more than 20 per cent of Australia's electricity by 2020, given the lower forecast electricity demand forecasts than have been previously assumed;
- the cost burden of the RET to society would be reduced; and
- there is no point in deploying more wind as nothing new is being learned.

The most common reason expressed in submissions as the basis for reducing the existing fixed target is to ensure that the scheme does not deliver more than 20 per cent of Australia's electricity by 2020, given the forecast reduction in electricity demand and the associated costs from the additional (relatively more expensive) renewable energy forms of generation. Most submissions in favour of a change to the target argued that there has been a 'material change' in the economic and electricity market conditions compared to the environment anticipated when the current LRET target was established. Participant views are explored in further detail in the section to follow.

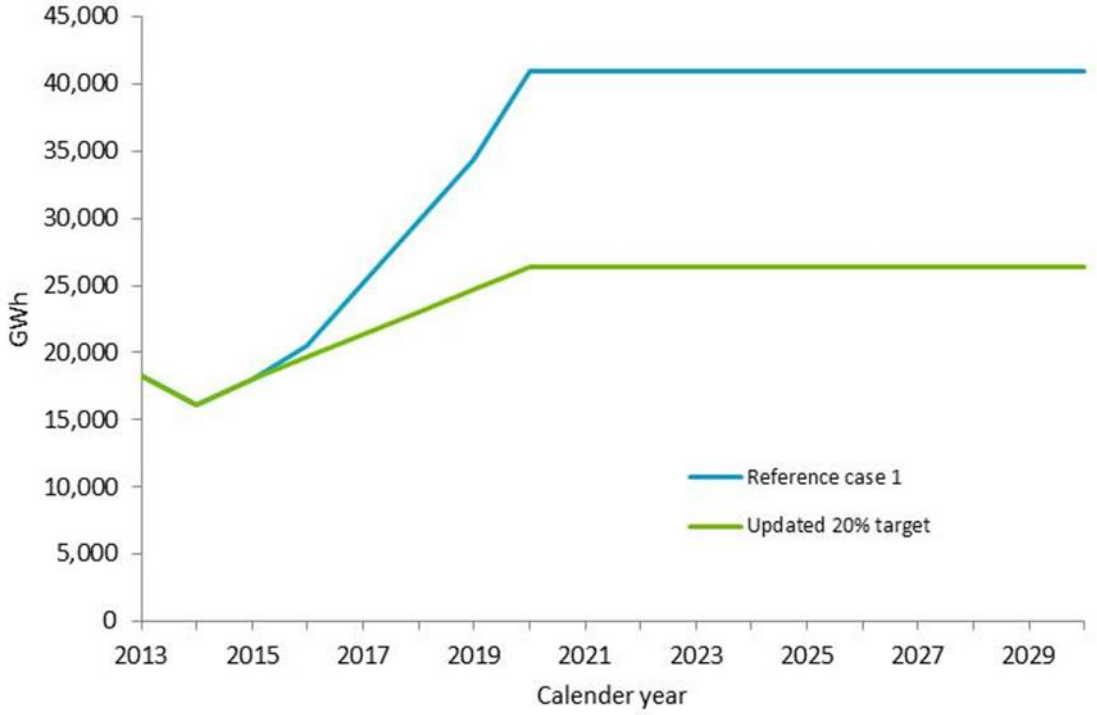
Authority modelling and analysis of an *updated 20% target* and comparison with *reference case 1*

On the basis of analysis conducted for the Authority, electricity demand Australia-wide (including customer load serviced by roof-top solar PVs and embedded generation and network costs) is currently expected to be around 257 000 GWh for the 2020 calendar year. To reach a 20 per cent renewable energy target (or 51 400 GWh) by 2020 (*updated 20% target* scenario), the following breakdown is assumed:

- baseline generation (pre-existing hydro) = 14 000 GWh;
- small-scale renewable technologies = 11 000 GWh; and
- large-scale renewable generation = 26 400 GWh.

In order to reach the revised 26 400 GWh target in the 2020 calendar year, interim targets currently in place would need to be adjusted (see Figure 29).

Figure 29 Large-scale renewable target under reference case 1 and updated 20% target scenarios



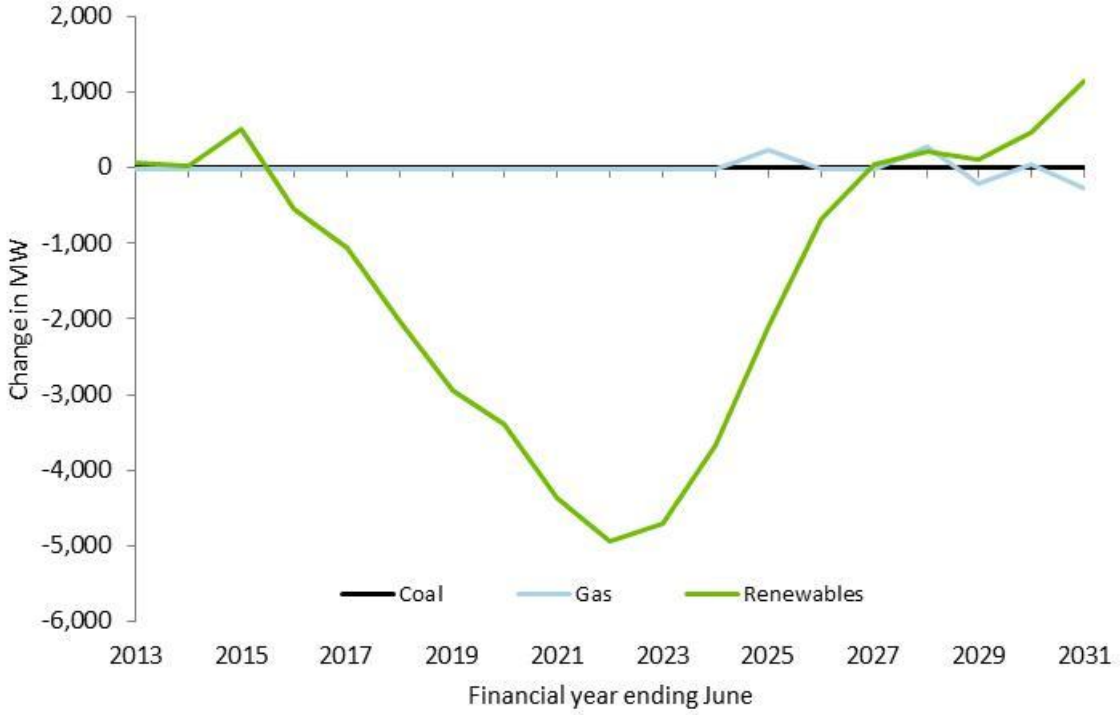
The following discussion examines the estimated impacts of moving to an *updated 20% target* scenario compared to reference case 1 with regard to:

- generation capacity and production;
- emissions;
- certificate prices;
- electricity prices; and
- household bills.

Generation capacity and production

Under an *updated 20% target* scenario, it is estimated there would be substantially less renewable generation capacity installed through most of the period from 2012-13 to 2030-31. By 2021-22 renewable generation capacity would be around 4 400 MW lower than under *reference case 1* (see Figure 30). However, by 2027-28 the difference is estimated to be largely eliminated, suggesting that a policy requiring a lower target as of 2020 would merely delay the introduction of renewable capacity, assuming that carbon prices then rose to a level that would make renewable energy developments competitive in their own right.

Figure 30 Change in generation capacity mix – Updated 20% target compared with reference case 1 (MW)*

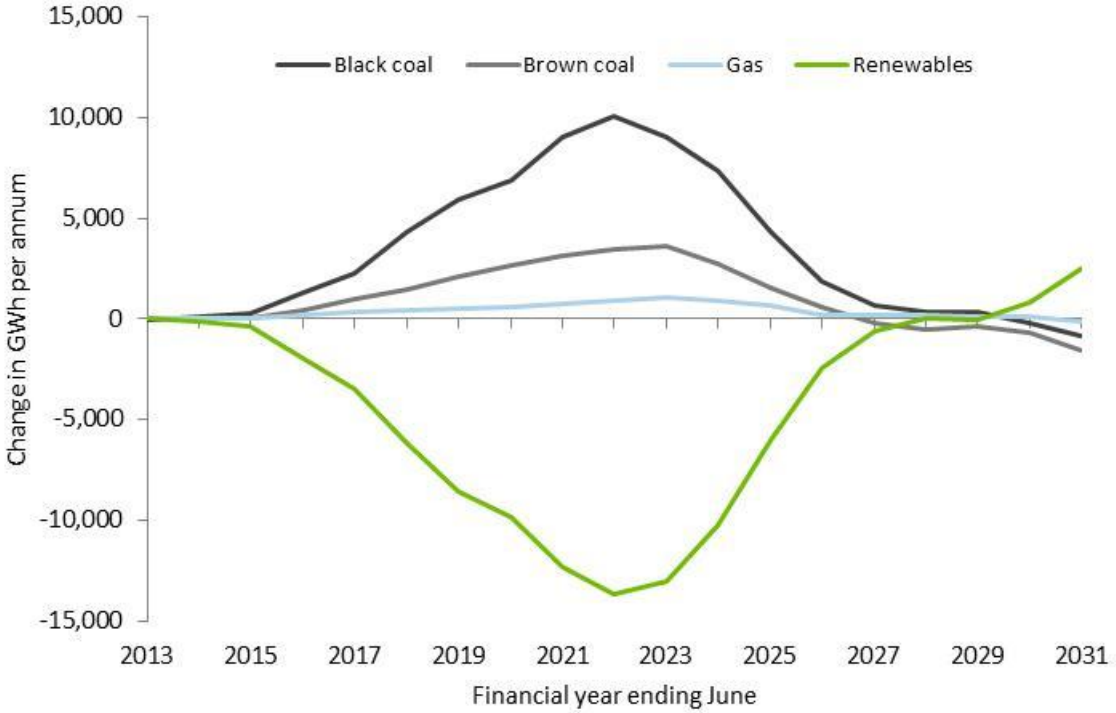


* A positive number indicates the value is higher in the *updated 20% target* scenario than in the *reference case 1* scenario.

With a lower target, generation from renewable sources is estimated to be substantially below the current settings (see Figure 31). At the peak of the differences between the two scenarios in 2021-22, under the *updated 20% target*:

- renewable energy generation is estimated to be around 14 000 GWh less (26 per cent of total renewable energy generation in that year);
- black coal-fired generation is estimated to be around 9 500 GWh more (7 per cent of total black coal-fired generation in that year);
- brown coal-fired generation is estimated to be around 3 800 GWh more (8 per cent of total brown coal-fired generation in that year); and
- gas-fired generation is estimated to be around 900 GWh more (3 per cent of total gas-fired generation in that year).

Figure 31 Change in generation production mix – updated 20% target compared with reference case 1 (GWh)*



* A positive number indicates the value is higher in the *updated 20% target* scenario than in the *reference case 1* scenario.

Table 5 Annual energy change between 2012-13 to 2030-31 under updated 20% target and reference case 1 scenarios (GWh)

	Updated 20% target	Reference case 1
Renewable generation	46 499 GWh (20 912 GWh to 2020-21)	44 067 GWh (33 284 GWh to 2020-21)
Gas-fired generation	5 867 GWh	6 019 GWh
Coal-fired generation	16 887 GWh	19 163 GWh

Resource costs

By transitioning to a lower RET target the savings in resource costs (annualised capex and opex) is estimated to be around $4.4 billion in net present value terms over the period 2012-13 to 2030-31 (see Table 6). The modelling does not, however, assume any change to renewable development costs that might flow from increased risk premiums associated with renewable energy policy uncertainty.

Table 6 NPV* of resource cost ($ million)

		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Absolute value	*Reference case 1* – lower carbon price	116 287	63 621	52 665
	Updated 20% target	111 926	61 066	50 861
Change between *updated 20% target* and *reference case 1*		-4 360	-2 556	-1 805

* Discount rate = 7 per cent.

Box 7 Wholesale prices and investment

The effect of the RET on wholesale electricty prices, the revenue and profitability of existing generators, and the incentives to invest in new generation have been raised in submissions to the RET Review.

In modelling conducted for TRUEnergy, ACIL Tasman states that modifying the RET would be unlikely to have a material impact on wholesale prices:

> *Modifications to the RET will have some short-term impacts upon wholesale electricity price outcomes. Policy changes which increase renewable development (at the margin) in the NEM will tend to depress wholesale electricity prices. Conversely, policy changes which reduce the amount of renewable development will tend to increase wholesale electricity prices. However, these effects will be small and the amount and timing of new entrant fossil fuelled capacity will adjust accordingly such that the wholesale market will not deviate from its equilibrium price path (Provided the RET policy settings doesn't result in a permanent change to the marginal new entrant technology). Owing to the lumpy nature of generation investment, in most cases the influence of RET policy changes upon modelled wholesale market outcomes, once new entry levels have been reached, can be characterised as modelling noise.(ACIL Tasman 2012, p.23)*

Alinta Energy puts forward the concern that, under current conditions, renewable generation is depressing wholesale prices and impacting on current non-renewable generators profitability which may lead to the early retirement of generation as well as not providing incentive for investment in new generation:

> *System security is compromised as wholesale prices are not sufficient to cover capital and operating costs and therefore new non-subsidised renewable generation is unlikely to be built. This leads to downward spiral in the investment climate in the electricity market. Second, existing generators will also not be able to cover costs, which are compounded by the introduction of carbon, and that places those generators under financial pressure. Those generators are likely to adjust their operation in response. (Alinta Energy, sub.89, p.5)*

The Australian Energy Market Commision 's submission comments on the impact LRET on wholesale electricty prices:

> *Prices in the wholesale electricity spot market have been at historically low levels in recent years due to relatively high level of generation, given recent falls in demand levels. Modelling undertaken for the AEMC suggested that the Large Scale Renewable Energy Target (LRET) distorts the balance of supply and demand in the wholesale electricty market. This occurs as the additional revenue renewable generators have access to through the sale of certificates serves to increase the level of renewable generation beyound the quantity that would have been otherwise developed. This leads to lower prices in the wholesale electricty market than there would have otherwise been which results in lower revenues and profitability for all generators. This may affect incentives to invest in new generation and impact the longer term reliability of the electricity supply.(Australian Energy Market Comission, sub.64, p.1-2)*

In relation to incentives for new entrants, the Authority notes that current electricity demand

forecasts suggest that the need for new entry has been significantly delayed. Modelling commissioned by the Authority estimates that wholesale prices would rise when new generating capacity is required.

Emissions

Total greenhouse gas emissions are estimated to be higher the lower is the large-scale renewable energy target.

As shown in Table 7, by moving to an *updated 20% target*, there is estimated to be a total of 94 Mt of additional emissions due to the higher levels of generation from fossil fuel-fired generation under an *updated 20% target scenario*.

Table 7 Emissions (Mt of CO_2e)

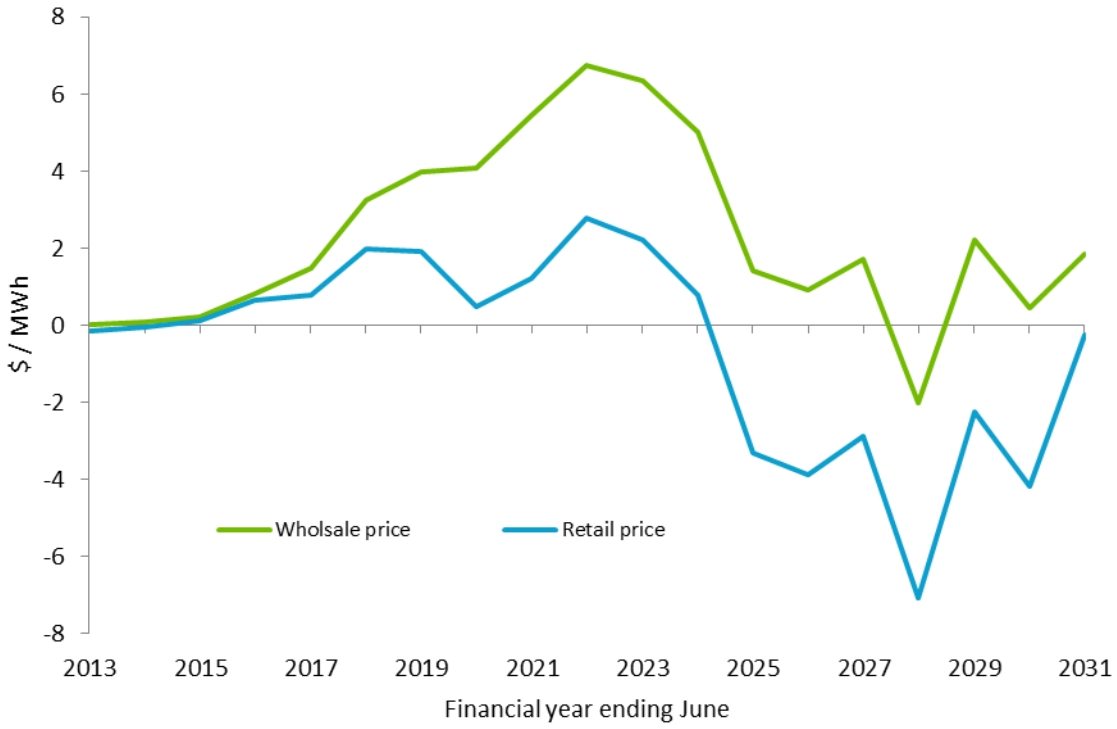
		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Absolute value	*Reference case 1* – lower carbon price	3 586	1 677	2 093
	Updated 20% target	3 679	1 721	2 155
Change between *updated 20% target* and *reference case 1*		94	45	62

The additional abatement under the *reference case 1* scenario , compared to *updated 20% target* scenario, is forecast to result in an average cost of abatement of $47 per tonne of CO_2e – calculated as $4 360 million resource cost saving divided by 94 Mt of CO_2e of abatement.

Energy consumer effects

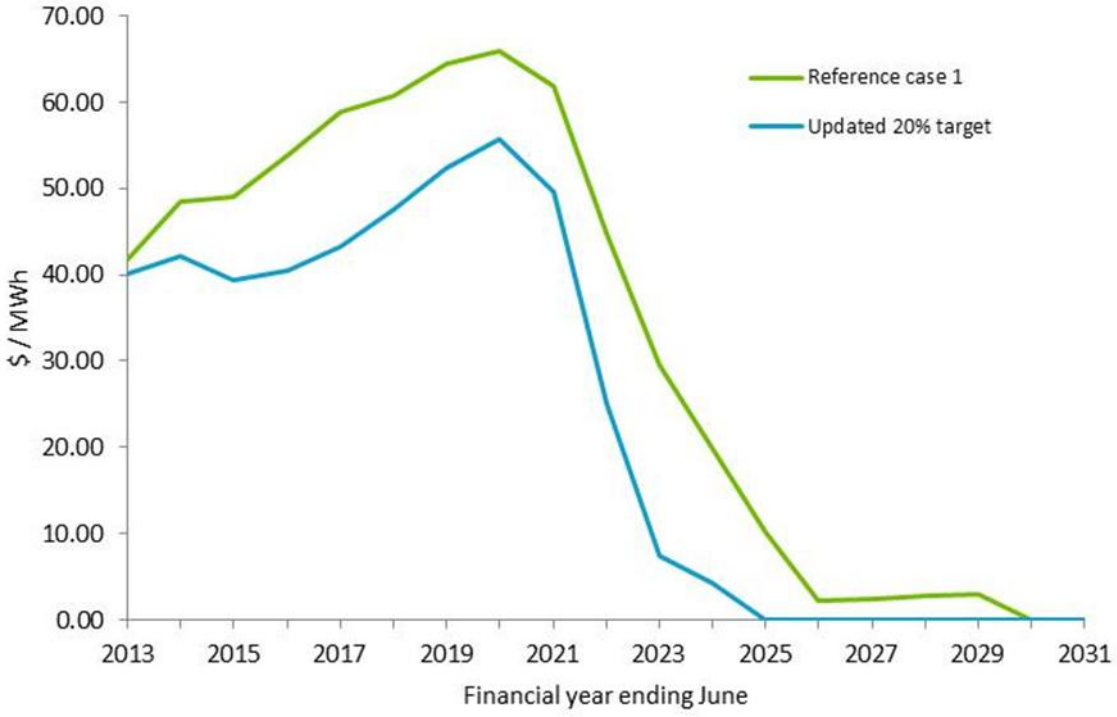
Although wholesale electricity prices are expected to be generally higher under an *updated 20% target* scenario (see Figure 32), there is only a marginal change in retail prices for all energy consumers (see Table 8) as the fall in LGC prices (see Figure 33) reduces the required certificate cost pass-through to consumers.

Figure 32 Change in wholesale and change in retail prices – updated 20% target compared with reference case 1 ($/MWh)



* A positive number indicates the value is higher in the *updated 20% target* scenario than in the *reference case 1* scenario.

Figure 33 LGC prices – updated 20% target and reference case 1 (GWh)



As a consequence of the marginal change in retail prices per unit of consumption, the effect on the average household bill is expected to be small – the long term average of the annual household bill

over the period 2013 to 2030 is forecast to be $4 lower (at $1 860) in the *updated 20% target* scenario (see Table 8 and Table 9). The net present value of the difference in household bills over the period 2012-13 to 2030-31 is estimated to be around $7.

Table 8 Retail prices

		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Average retail price	*Reference case 1*	$266/MWh	$228/MWh	$300/MWh
	Updated 20% target	$266/MWh	$229/MWh	$299/MWh
RET cost contribution to *reference case 1* retail prices		$9.74/MWh	$9.58/MWh	$9.88/MWh
		3.7%	4.2%	3.3%
RET cost contribution to *updated 20% target* retail prices		$6.44/MWh	$7.47/MWh	$5.53/MWh
		2.4%	3.3%	1.9%

As indicated in Table 9, the annual cost of the RET to the average household in 2020-21 is estimated to be lower under the *updated 20% target* scenario at around $45 per household compared to around $68 per household under *reference case 1* (see Table 4). As noted earlier, the difference in the RET costs per household is estimated to be offset by the difference in wholesale electricity prices.

Table 9 Average annual household bill

		2012-13 to 2030-31	2012-13 to 2020-21	2021-22 to 2030-31
Absolute value (average $ per annum)	*Reference case 1*	$1 864	$1 598	$2 103
	Updated 20% target	$1 860	$1 603	$2 090
RET cost contribution to *reference case 1* household bill		$68	$67	$69
		3.7%	4.2%	3.3%
RET cost contribution to *updated 20% target* household bill		$45	$52	$39
		2.4%	3.3%	1.9%

* Assumes average household consumes 7MWh per annum.

Authority's assessment of costs and benefits of reducing the target

In general, submissions in favour of a reduction to the target argued that there has been a 'material change' in the economic and electricity market conditions compared to the environment anticipated when the initial LRET target was established. For example, the Business Council of Australia stated:

> *We believe that the current level of the target is materially out of line with the stated objective of the policy mechanism. What is required is a return to the 20 per cent target based on current AEMO demand forecasts not the forecasts that applied at the commencement of the RET. (Business Council of Australia, sub.130, p.6)*

International Power-GDF SUEZ Australia's submission states that:

> *IPR-GDFS recommends that the total target for renewables in Australia be reduced to recognise the distortionary impact that 45+TWh of renewable generation is having on electricity markets in Australia and the recent changes to electricity demand in Australia. (International Power-GDF SUEZ Australia, sub.83, p.7)*

The National Generators Forum has echoed this view:

> *The NGF is however concerned that the fixed LRET target of 41 TWh/a, in light of an unprecedented reduction in electricity demand since 2008, has the potential to cause material harm to the National Electricity Market.(National Generators Forum, sub.160, p.1).*

Against this background, three alternative options have been put forward in submissions for reducing the existing target.

First, some submissions, including the Business Council of Australia and Origin Energy, argued for a once-off adjustment to the target. For example, Origin Energy's submission advocates a reduction in the level of the target to around 27 000 GWh in 2020 to account for, among other things, the lower electricity demand. Origin's submission states:

> *… we are advocating a one-off adjustment to the volumetric (GWh) target, not an arrangement whereby the volumetric target varies as a function of changes in annual projections for future energy consumption. (Origin, sub.69, p.7)*

Second, TRUenergy has proposed a gateway approach to reducing the level of renewable energy encouraged by the RET scheme. TRUenergy's submission states:

> *To balance investor confidence with the flexibility to achieve a "real 20 per cent by 2020", three years of fixed targets should be determined followed by an upper and lower gateway of targets based on the range of possible demand outcomes. The three years of fixed targets should then be added to annually from within the specified gateway …in defining the specific targets for the LRET and SRES, a fixed ratio of the total renewable target would be specified. (TRUenergy, sub.102, p.8)*

Power and Water Corporation has proposed a similar mechanism to manage a reduced target due to a decrease in electricity demand. Its submission states:

> *The gigawatt hour target should be fixed in five yearly increments, with adjustments for subsequent five year increments to ensure the overall % target is met. (Power and Water Corporation, sub.137, p.1)*

Third, Ergon Energy has also proposed annual adjustments to the target reflecting projections of electricity demand in that year, stating in their submission:

> *Ergon Energy considers that the 20% renewable energy policy target should be the constant with the target GWh being adjusted accordingly.(Ergon Energy, sub.88, p.6)*

A number of submissions argued against any change to the level of the target on the basis that it could increase the perception of future investment risk. Once a precedent has been set for changing the target in the face of changed RET parameters, it would be difficult for the Government to argue convincingly that no further changes should be contemplated in the future. For example, Australian Industry Group's submission stated:

> *…lowering the existing targets would raise serious questions. Would it be a one-off adjustment, or part of an ongoing process? How could confidence be established that an adjustment was for once and all, and what would happen if electricity demand projections declined further – or rebounded? Certainly, ongoing adjustments to the 2020 targets would mean intense uncertainty. The nature of investment decisions in long-lived, capital intensive assets means that such uncertainty would be severe for new investment, likely raising financing costs or leading to more frequent imposition of the shortfall charge. It would also*

mean heightened risks and lower returns for businesses that have invested on the basis of existing law. (Australian Industry Group, sub.46 , p.8)

This view was echoed in the Climate Markets and Investment Association's submission which stated:

The LRET should not be revised to change with energy forecasts as this will only increase investment uncertainty in the development of renewable projects and will impact investor appetite for investment in renewable projects. (Climate Markets and Investment Association, sub.94, p.1)

RATCH-Australia's submission stated:

Uncertainty about the future level of the RET is leading to caution in investment in renewables. Developers of renewable projects currently face difficulty in achieving financing for projects due to this uncertainty, as offtakers (primarily the electricity retailers) seek to pass on RET review risks to the project owners. In addition, offtakers are reticent to sign offtake agreements due to this uncertainty.(RATCH-Australia Limited, sub.134, p.3)

Similarly, Australian Sugar Milling Council's submission stated:

Several more cogeneration expansion opportunities are under development in the sugar milling industry – but critical to ongoing investment under the scheme is policy certainty. (Australian Sugar Milling Council, sub.140, p.1)

AGL Energy has conducted its own survey and analysis to quantify the potential effect of uncertainty on the financing of projects, stating that:

Nelson, Nelson, Ariyaratnam and Camroux (2012) 1 [attachment to AGL Energy's submission] show that policy uncertainty, measured by a material amendment to the LRET, would result in financing 'premium penalties' being applied to both renewable and thermal generation projects. That is to say, perceptions of ongoing policy uncertainty (driven by experience related to changes to the LRET after only two years of operation) would lead to additional costs being applied by financiers of power generation. The end result would be a further widening of actual pricing from efficient levels. These costs would likely manifest themselves as higher costs to consumers – up to $119 million (NPV) in the event of a significant amendment to the RET (eg. a reduction in the target), and $51 million (NPV) in the event of a repeal of the RET. These costs are over and above any savings resulting from lower LGC liabilities as a result of changes to the LRET targets. (AGL Energy, sub.38, p.2)

The Climate Institute also asserts that there are benefits and costs that are not generally identified:

The RET also generates immediate benefits, including $19.5 billion forecast to be spent directly in renewable energy investment by 2020 (Bloomberg New Energy Finance, 'What to expect from Australia's Renewable Energy Target review', Research Note, 9 August 2012) and the reduced costs of policy uncertainty noted above, worth $266 million in 2020. (Climate Institute, sub.86, p.13)

The Investor Group on Climate Change expressed concern about the potential effects of policy change:

Investors, particularly in infrastructure assets, seek policy settings that are long term, low risk, have low volatility and evolve predictably. Changes to the design or operation of the RET at this time will weaken the confidence of investors, not only about the future of the RET, but the stability of climate policy in Australia. This is likely to undermine investment plans, current and future, in renewable energy in Australia and would also likely have a negative impact on the

returns from existing energy infrastructure investments. (Investor Group on Climate Change, sub.70, p.4)

In addition, Professor Ross Garnaut stated in his submission:

In [the current] set of circumstances, for reasons of business certainty, it would be wise to retain the [RET] with the legislated parameters. (Professor Ross Garnaut, sub.167, p.2)

On balance, the Authority's preliminary view is that a reduction in the level of the target would increase uncertainty and thereby hamper renewable projects' access to finance and increase the risk premiums associated with finance.

A common issue for the three key options to reduce the target is the considerable uncertainty associated with the future path of electricity demand. Previously, electricity demand appeared to be closely related to overall economic growth. More recently, this connection appears to have become more complicated.

Of the options, a once-off reduction is likely to have the least-worst impact on regulatory uncertainty and risk premiums. By comparison, under the gateway approach, if future annual gigawatt hours targets could be reduced in line with unexpected future movements in energy demand, investors would likely to be reluctant to invest in plants that could potentially be stranded. As renewable power stations are built, risks would increase with each subsequent investment that there will be a future reduction in the target and the market will be over-subscribed. Similarly, retailers would be unlikely to lock-in future power purchase agreements that included the purchase of renewable certificates if there was a risk that those future certificates would not be required – not only by that liable party, but the market as a whole. Such uncertainty would increase further still under an approach that allows for annual adjustments to the target.

In addition, the Authority's modelling estimates that moving from *reference case 1* to an *updated 20% target* would:

- save around $4.4 billion in resource costs (changes in annualised capital and operating costs between now and 2030-31), out of a total resource cost in the generation sector of around $116 billion over the period;
- increase emissions in the stationary energy sector (around 94 Mt increase over the period from 2012-2013 to 2030-31) because there would be less renewable generation displacing existing fossil fuel-fired generation; and
- increase the average household bill – around $7 difference in NPV terms in total electricity bills over the period from 2012-13 to 2030-31.

Overall, the Authority's preliminary view is that the existing target of 41 000 GWh should not be reduced in line with lower electricity demand. The Authority considers that the likely resource cost savings to society overall that could be achieved by reducing the target do not appear large enough to warrant the damage to stability, predictability and investor confidence that such a change could entail. In terms of the impacts on electricity prices paid by energy users, taking into account both the cost of certificates and the impacts on wholesale electricity prices, modelling to date suggests that the difference between the scenarios is likely to be small, and the net present value of the impact on average household bills between now and 2030 to be small.

4.3.2. Increase the target

A number of stakeholders, largely individual respondents and non-governmental organisations and some renewable energy proponents have expressed the view that the RET should be increased to deploy more renewables into Australia's electricity mix.

Most submissions proposing an increase to the target have cited the additional investment in renewable energy that would be created by the activities of the CEFC as their rationale. This rationale is considered in more detail in the section to follow.

Proposals for an increased RET target – of up to 100% renewables – have been put forward by participants including Beyond Zero Emissions, 100% renewables, Australian Youth Climate Coalition, World Wildlife Foundation and Doctors for the Environment Australia Inc. The justifications for these proposals include:

- the importance of climate change mitigation;
- promotion of energy diversity;
- societal health benefits; and
- preventing the renewable industry and investment from stalling.

Increasing the target for the Clean Energy Finance Corporation

As mentioned previously, some participants have argued that the RET targets should be increased to account for the additional LGCs generated by projects under the CEFC. For example, the Australian Conservation Foundation's submission states:

> *Making CEFC projects additional to the RET will not only unlock greater installed capacity and employment, but will also increase the efficiency of government spending … And given that the CEFC will focus on supporting emerging technologies, these additional projects will complement the wind energy projects favoured by the RET, delivering a more diverse, secure and flexible energy generation mix. (Australian Conservation Foundation, sub.7, p.2- 3)*

GetUp has put forward the view that:

> *… if the CEFC's projects are viewed as part of the RET there is a risk that the CEFC and RET will work in concert to actually limit investment and stall the growth of renewable energy in Australia. (GetUp, sub.168, p.3)*

The Conservation Council of South Australia's submission outlined a range of disadvantages that might be associated with failure to increase the RET to account for CEFC funded projects. One of the disadvantages identified was that taxpayer's money could be spent without additional environmental benefits.

Concern was also expressed about the uncertainty that may be imposed on the RET market should the target fail to be increased to account for CEFC projects. For example, RATCH-Australia Corporation states:

> *The size of the CEFC is such that it could have a potentially distorting effect on the outcome if it were allowed to be included in the existing LRET target, and that would increase uncertainty for private investment. (RATCH-Australia Corporation, sub.134, p.11)*

This perspective is echoed by LMS Energy:

> *If the [CEFC] does finance projects at significantly lower commercial rates, any LGCs created from these projects should be additional to the 41,000 GWh target, otherwise the CEFC financed projects could crowd out privately funded renewable energy projects. (LMS Energy, sub.79, p.7)*

However, some stakeholders hold a contrary view – for example, Alstom Limited states:

> *CEFC financing simply displaces commercial financing, and there is no reason why it should be treated differently in terms of the target. (Alstom Limited, sub.10, p.3)*

Furthermore, Infigen states that the RET should not be increased at this time due to political uncertainty associated with the CEFC:

> *The CEFC does not begin operations until July, 2013 – just a few months before the next Federal election. As with the Carbon Price, there is some political uncertainty with regards to the future of the CEFC. Should the CEFC continue to operate well into this decade, as Infigen Energy agrees it should, then it is possible that this topic may be worth further consideration in future RET reviews. (Infigen Energy, sub.111, p.6)*

In examining how RET operation should account for CEFC activity, the Authority has considered:

- the differing roles of the RET and the CEFC; and
- the practical challenges in accounting for projects with a yet to be defined scope.

As discussed in Chapter 3, the Commonwealth Government has formed the CEFC to help bridge the gap between earlier stage innovation and deployment. This role could ultimately affect the mix of technologies that are deployed to meet the RET targets.

The CEFC Expert Review Report noted that the CEFC will supplement the RET and a carbon price (The Australian Government the Treasury, 2012, p.IX). The report explains that:

> *The CEFC is part of a suite of Commonwealth Government initiatives designed to transform the Australian economy for a cleaner energy future. The RET and carbon price will be the primary drivers in this. (The Australian Government the Treasury, 2012, p.9)*

The intent that the CEFC and the RET should work alongside each other is reiterated by Commonwealth Government Department of the Treasury in their evidence to the House Economics Committee:

> *The purpose is to overcome the financial barriers. The renewable energy target affects the pricing of renewable energy and what can be achieved, but the individual projects themselves may still have barriers which inhibit investment. The purpose of the CEFC is to address those barriers and not the target itself. (Commonwealth, House of Representatives, 2012)*

Moreover, there are distinct practical challenges in changing the target to account for CEFC investments. In particular, there are significant uncertainties about:

- the level of renewable generation that the CEFC will support given its goal to invest 50 per cent or more of available funds in the renewable energy;
- the types of technologies it would support given the definition of renewables includes hybrid technologies and technologies (including enabling technologies) that are related to renewable energy technologies; and

- when those investments will deliver electricity to the market.

The CEFC has not yet commenced operations (it starts in July 2013), and its investment mandate has not been finalised. The uncertainty about exactly what the CEFC is likely to fund could persist for some time.

Authority's assessment of the costs and benefits of increasing the target

The Authority's preliminary view is that there is no compelling reason to increase the renewable energy target at this time. The Authority believes the CEFC was primarily intended to alter the mix of renewable energy projects that proceed in Australia. Moreover, the CEFC only comes into operation on 1 July 2013 and the types and timing of renewable energy projects to be funded by the CEFC will not be known for some time.

Increasing the target would also mean that the electricity sector in Australia would generate less greenhouse gas emissions, which is one of the objectives of the RET. (In practice, this would mean that Australia would tend to buy fewer international permits to meet its national emissions reductions targets.)

The Authority has also considered the alternative rationales for increasing the target as presented by participants. Measured against the Authority's expressed desire to maintain regulatory certainty in order to ensure the efficient operation of the RET, the Authority does not consider the target should be increased at this stage.

Nevertheless, these rationales should be considered in the 2016 review as recommended in Chapter 3 after:

- the existing RET policy has had sufficient time in which to operate as two separate schemes; and
- the CEFC has been operational for a number of years with an investment mandate that is clear to industry participants.

This view is shared by the Clean Energy Council:

> *The CEFC and future reviews of the RET may consider this matter once the CEFC is fully operational and beginning to make investment decisions. This impact and risk may also be addressed by considering increases in the RET target beyond 2020. Again, this should be done at a later stage. (Clean Energy Council, sub.12, p.13)*

4.4. Form of the target

As highlighted in section 4.1.1, there has always been potential for conflict between policy statements about how much renewable energy the RET (and the MRET before it) is designed to achieve in terms of a percentage of total energy demand (20 per cent; and additional 2 per cent), versus the fixed gigawatt hour targets included in the legislation which define actual liabilities.

This ultimately translates into whether the form of the target is intended to be fixed or floating. Indeed, this was reflected in the range of submissions to the Review.

A number of stakeholders believe the intended outcome was to deliver 20 per cent of energy demand in 2020. For example, Origin Energy states:

> *The original intention was a target of 20% renewable energy supporting multiple renewable energy technologies to strategically position Australia with a portfolio of renewable energy*

options for a long-term (post 2020) transition to a low carbon economy. (Origin Energy, sub.69, p.1)

The Major Energy Users Inc too believe this to be the case:

… it is clear that the core objective of the Act is to have 20% of electricity used in 2020 to be from renewable sources. (Major Energy Users Inc, sub.102, p.7)

The case for a fixed gigawatt target is articulated by Vestas in their submission:

The choice of a headline percentage-based target is to a significant extent arbitrary, and the choice of a fixed gigawatt hour target to match the percentage goal is necessarily based on point estimates of future consumption. The fixed gigawatt hour target itself, however, then becomes a stable basis for investment decisions. (Vestas Australian Wind Technology Pty Ltd, sub.57, p.6-7)

This point is echoed by Meridian Energy Australia:

While the RET scheme has often been summarised as a "20% by 2020" target, this label has simply been a convenient abbreviation for what has always been a fixed volume target. (Meridian Energy Australia, sub.159, p.4)

The Authority considers that the Tambling Review's reasoning and conclusion that a fixed target is preferable to a floating target remains sound (see section 4.1). In particular, the period over which the RET has operated in its various forms has shown the inaccuracy of initial estimates of relevant parameters and demonstrated that there will need to be constant readjustment of any floating target, creating significant risk for investors, increasing the risks of not meeting any particular target and raising overall costs. The Authority's initial view, therefore, is that the form of target should continue to be expressed in terms of a fixed gigawatt hour level.

DRAFT RECOMMENDATION

R.2. The preliminary view of the Authority is that the form of the target should continue to be expressed in legislation in terms of a fixed gigawatt hour level.

4.5. Conclusion

Almost all submissions commented on the level and form of the LRET target. Submissions regarding the target fell broadly into three categories:

- maintain the target to provide the regulatory certainty necessary to drive investment in renewable energy generation;
- reduce the target to reflect lower electricity demand forecasts, thereby saving costs; and
- increase the target to drive additional renewable energy deployment and account for the additional large-scale certificates that may be created by CEFC projects.

The Authority has carefully considered all submissions and commissioned electricity market modelling to estimate the effects of making potential changes to the current target.

Since 2009, a number of significant changes have been made to the RET. This has created uncertainty about the regulatory environment. The Authority considers that a material adjustment to the target would exacerbate this situation and affect the likelihood of meeting any given target. This is because

increased uncertainty is likely to hamper renewable projects' access to finance and increase the risk premiums associated with finance.

With regard to reducing the target, the Authority's preliminary view is that the expected benefits associated with reducing the target (in the form of cost savings), do not outweigh the costs of heightened perception of regulatory risk and associated project risk premiums.

The Authority's preliminary view is that an increase in the RET target is not warranted at this stage, particularly given the introduction of the carbon pricing mechanism (see Chapter 3). In relation to proposals for an increased target as a result of CEFC projects, the Authority is of the view that the CEFC and the RET are designed for different purposes. Moreover the investment mandate has not been defined and thus what renewable energy projects and when they will be delivered is ambiguous. In addition, it may be that the regulatory uncertainty created by increasing the target adversely affects the amount of renewable energy

For these reasons, it is the Authority's preliminary view that the target should be maintained at its current level and in its current form. Nonetheless, the Authority recognises the dynamic context in which the RET operates. As such, it will be important to reconsider the target in the Authority's recommended 2016 review. At this time the RET would have had the opportunity to operate for a period of time in its large and small-scale form. Moreover, there will be more information about the carbon price trajectory, electricity demand trends and the nature of CEFC projects.

DRAFT RECOMMENDATION

R.3. The preliminary view of the Authority is that the existing large-scale renewable target of 41 000 GWh and interim targets should be maintained in their current form.

R.4. The preliminary view of the Authority is that the Renewable Energy Target Review in 2016 is an appropriate time to consider adjusting the targets beyond 2020 in light of the policy and economic conditions prevailing at that time.

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CHAPTER 5. THE SMALL-SCALE RENEWABLE ENERGY SCHEME

This chapter considers the architecture of the Small-scale Renewable Energy Scheme (SRES). It explores whether there is a case for it to continue to operate separately from the Large-scale Renewable Energy Target (LRET). It also assesses potential improvements to the design of the scheme with a focus on possible cost containment mechanisms. Finally, it explores the role and utility of the clearing house and possible amendments to improve its operation.

The SRES provides upfront support for households and small businesses to install small-scale renewable energy systems, such as solar water heaters and small generation units (small-scale solar photovoltaic (PV), wind and hydro). The SRES has operated separately from the LRET since 2010, with different eligible technologies, certificates and surrender obligations.

While the SRES will contribute substantially lower gigawatt hours (GWh) than the LRET, it provides a mechanism by which households and small businesses can actively participate in the RET.

This chapter:

- provides background on the SRES and why it was separated from the LRET (section 5.1);
- considers whether the two schemes should be merged (section 5.2);
- examines the design of the SRES and considers whether the scheme should be subject to further cost containment measures, such as a quantitative gigawatt hour cap, a price cap or discounting through a multiplier of less than one (section 5.3.1); and
- explores the utility and future role of the clearing house (section 5.3.2).

5.1. History of the Small-scale Renewable Energy Scheme

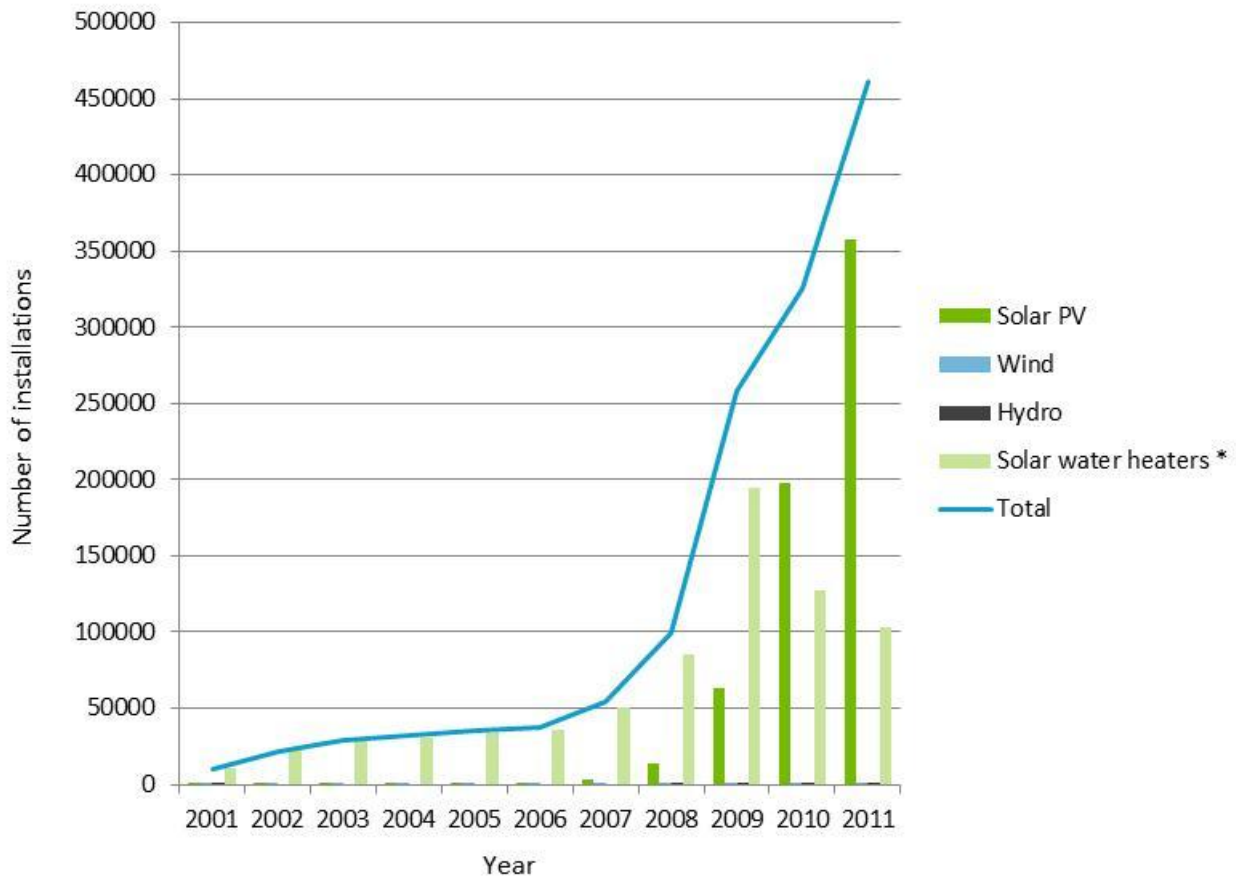
Small-scale systems, in the form of solar water heaters and small generation units, have been included in the Renewable Energy Target (RET) and its predecessor, the Mandatory Renewable Energy Target (MRET), since its inception in 2001. Historically, the uptake of these systems was relatively low (see Figure 34). This changed in 2009 when the Commonwealth Government introduced ‘Solar Credits’ to replace the Solar Homes and Communities Plan. Solar Credits was intended to provide an upfront capital cost subsidy worth around $7 500 by applying a multiplier – initially set at five – to certificates generated from small generation units (Swan et al, 2008). This occurred at a time when system costs were falling and the value of the Australian dollar was increasing, and at a time when states and territories had in place relatively high feed-in tariffs (see Box 8). These factors contributed to a large increase in the installation of small generation units and, consequently, renewable energy certificates (exacerbated by the Solar Credits multiplier) (see Figure 35).

Box 8 State and territory feed-in tariffs

Feed-in tariffs were introduced by state and territory governments to encourage the installation of small generation units (largely focused on solar PV). Feed-in tariffs may be 'net' or 'gross'. A net tariff deducts the amount of energy consumed by the customer from the renewable energy produced. If production exceeds use, the net feed-in tariff is paid for the remaining energy. A gross tariff pays on the basis of the total amount of renewable energy a system generates, regardless of the amount of energy used by the customer, and the customer pays for its electricity use separately.

Many of the feed-in tariffs introduced by states and territories in 2009 and 2011 were at a rate much higher than wholesale electricity prices. For example, from July 2008, the Australian Capital Territory had a gross feed-in tariff of 50.5 cents per kilowatt hour (kWh), which was reduced to 45.7 cents per kWh in April 2010. New South Wales also had a gross feed-in tariff of 60.0c/kWh from January 2010 to June 2011. In general, the states and territories have now adjusted feed-in tariffs to rates comparable with wholesale electricity prices.

Figure 34 Number of installations of small-scale systems, 2001-2011

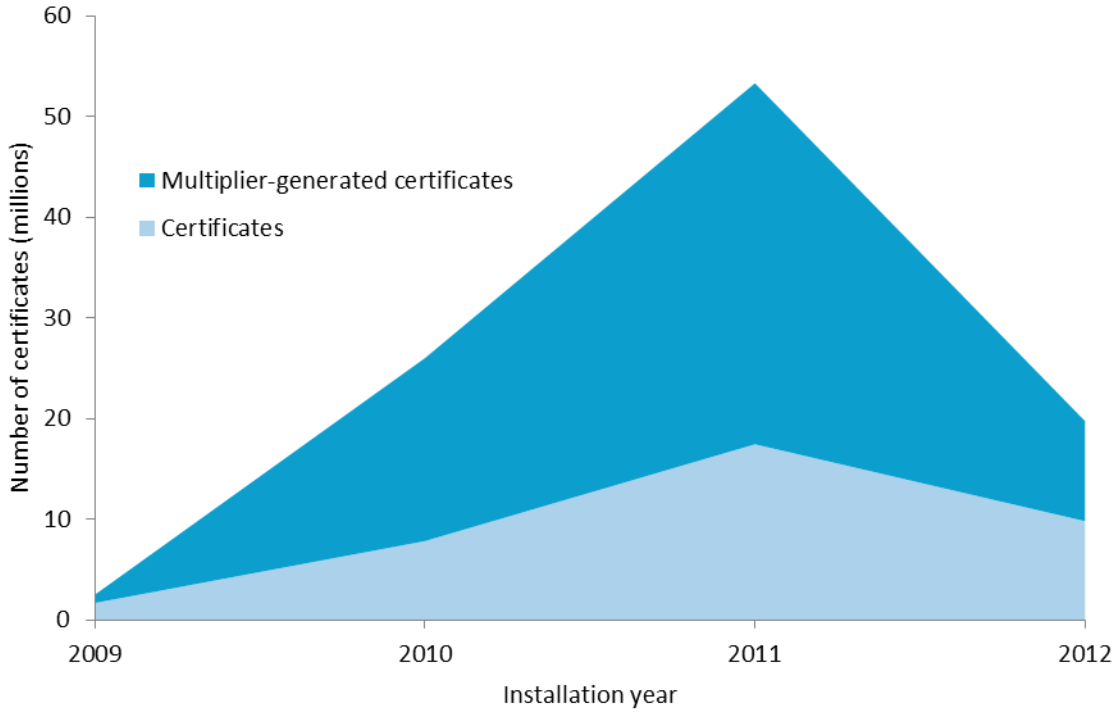


Notes: Installation numbers in 2011 may be higher as owners/agents have one year to register small-scale systems. In addition, installations of small-scale wind and hydro systems are very low – hydro ranging from zero to 5 installations per year from 2001-2011 and wind ranging from 1 to 136 installations per year.
Source: Clean Energy Regulator, 15 July 2012

The increased supply of certificates created uncertainty for both the large-scale and small-scale renewable energy sectors. The certificate price was not sufficient to support large-scale projects and investment stalled. Similarly, businesses providing small-scale systems were unable to provide accurate information to customers regarding the price they were likely to receive for certificates.

As explained in Chapter 1, the Government responded to these circumstances by legislating to separate the RET into two schemes: the LRET – for large-scale projects – and the SRES, to assist households and businesses with the upfront costs of small-scale systems. The separation created two distinct obligations for liable entities which had to be met through the surrender of different certificates (large-scale generation certificates for the LRET and small-scale technology certificates (STCs) for the SRES).

Figure 35 Certificate generation from small-scale systems – "certificates" versus "multiplier-generated certificates" 2009-2012



Notes: Installation numbers for 2011 and 2012 may be higher as owners/agents have one year to register small-scale systems. Also, the date only includes systems that have been validly created and does not include creations pending audit
Source: Clean Energy Regulator, 15 July 2012.

5.2. Two separate schemes?

Many of the distorting factors that led to increased certificate creation from small-scale systems – and the consequential creation of the SRES – are no longer in play. The reduction of the Solar Credits multiplier has been brought forward and will end by 1 July 2013 (see Table 10) and state and territory feed-in tariffs are now generally comparable to wholesale rates. In light of this, it should be considered whether it is worth bearing the additional expense of maintaining two separate schemes or whether the schemes should be merged. For example, in its submission, Stanwell Corporation noted:

> *A separate SRES is no longer necessary as the reduction in the solar credit multiplier largely brings small scale projects in-line with large scale investments. (Stanwell Corporation, sub.139, p.2)*

The costs and benefits of merging the SRES into the LRET are considered below in terms of the Authority's principles of economic efficiency and environmental effectiveness.

Table 10 Solar credits multiplier

Time frame	Multiplier
9 June 2009 – 30 June 2010	5x
1 July 2010 – 30 June 2011	5x
1 July 2011 – 30 June 2012	3x*
1 July 2012 – 30 June 2013	2x
1 July 2013 onwards	1 x (no multiplier)

* The multiplier changed from four times (4x) to three times (3x) from 1 July 2011 to 30 July 2012 to reflect faster than expected decreases in the cost of systems as well as unforseen assistance from state and territories in the form of feed-in tariffs.
Source: REE Regulations 2001

5.2.1. Cost and administrative requirements

In terms of economic efficiency, operating two separate schemes is likely to impose a greater cost on society than a single scheme. The separation of the SRES and LRET effectively operates as 'banding' within the RET (see Chapter 8), with separate incentives – or 'bands' – for large-scale and small-scale renewable energy generation. This potentially increases the cost of the scheme as more expensive technologies may be deployed than if large-scale and small-scale renewable energy were in direct competition to meet the same target. Furthermore, two schemes create greater administrative requirements, and therefore costs, for liable entities, the Government and the Clean Energy Regulator.

Most of the stakeholders that supported merging the schemes did so on the grounds that it was likely to lower costs. For example, Australian Paper submitted:

> *We would recommend to the CCA a wholesale review of the SRES and SRET schemes as this aspect of the REE has created significant problems and expense for business. The uncapped nature of the scheme, along with an inappropriate [feed-in tariff] and deemed multiples resulted in unforeseen and uncontrolled cost imposts.*
>
> *To give an indication of the impost on our business, for one site alone the STC charge amounts to almost 20% of our energy cost. For an energy intensive industry this is a significant impost. (Australian Paper, sub.53, p.4)*

Ergon Energy drew attention to the increased administrative burden of complying with two schemes:

> *The separate scheme has posed an additional administrative burden on liable entities. Ergon Energy has been required to establish and maintain separate models to administer, track and settle both large and small certificates in two separate markets.*
>
> *Furthermore additional work has been entailed in the monitoring of the separate scheme to ensure Ergon Energy acquired Small-Scale Technology Certificates (STC's) at the lowest possible cost. (Ergon Energy, sub.88, p.8)*

Modelling commissioned by the Authority indicates that the resource cost of maintaining separate schemes is higher than combining the schemes, costing approximately $1.2 billion (in June 2012 dollars) more to 2020-21 and $2.1 billion (in June 2012 dollars) to 2030-31. This is largely because the separate schemes result in approximately 7 000 GWh of additional renewable energy

generation (the modelling assumed a combined scheme target of 45 000 GWh and separate schemes of approximately 52 000 GWh).

The modelling also shows that by combining the schemes the impact on wholesale prices would be an additional $1.51/MWh in 2020-21 and remain so in 2030-31, in 2012 dollars. There is no significant cost difference between maintaining a separate SRES and combining the schemes in terms of impact on final retail prices. In fact, the modelling suggests that in net present value terms, households are slightly better off under a separate scheme. This can be explained due to the lower wholesale price which effectively cancels out the additional compliance costs.

The majority of submissions – including from environmental and business groups, liable entities and the renewable energy industry – supported retaining two separate schemes. The main reason put forward for retaining the separate schemes was regulatory certainty and concern that further regulatory changes might jeopardise the prospect of meeting the 41 000 GWh target. Some stakeholders also argued that merging the schemes would crowd out investment in large-scale renewable energy projects.

In principle, whether the RET operates as one scheme or separate schemes should not affect the amount of renewable energy generated, and therefore, its environmental effectiveness. These factors will be determined by the level of the target or targets. In practice, because the SRES is currently uncapped (that is, there is no limit on the amount of renewable energy to be supported under the SRES), merging the schemes and imposing a single quantitative cap could potentially limit the amount of renewable generation from small-scale systems. However, this could be addressed by setting an overall target that fully accounts for future SRES generation.

That said, merging the schemes may affect the likelihood of meeting the target if the merger creates sufficient regulatory uncertainty to limit future investment in renewable energy projects. This was a significant concern for many stakeholders, for example, the Investor's Group on Climate Change noted:

> *Investors deploy capital in long-term infrastructure projects based on the assumption that policy regimes will remain on foot for the course of the economic life of these projects. The prospect of frequent changes to regulatory arrangements undermines investor confidence and ultimately constrains the flow (of) capital, either by increasing risk premiums or leading investors to prefer alternative investment opportunities. Neither the form of the 2020 target nor the level of the gigawatt hour target should be modified. Opting not to make any changes now, and limiting the scope and frequency of future reviews will provide the most positive impetus to realising the current 2020 LRET in a relatively efficient way. (Investor's Group on Climate Change, sub.70, p.8)*

In the last three years, the RET has undergone several significant amendments – the expansion and inclusion of multipliers in 2009, and separation of the scheme into two in 2011. The Government has also brought forward the reduction of the Solar Credits multiplier. A constantly shifting regulatory framework (or the perception of one) may reduce investors' willingness to invest in further renewable energy, and increased perceptions of risk may increase the cost of making such investments.

Many stakeholders considered that a further change to merge the schemes would exacerbate this situation, for example, AGL noted that the schemes had only been separated for a short time and to remerge them so quickly would undermine policy certainty and investment confidence:

> *AGL strongly supports the current and continued separation of the RET scheme into the LRET and SRES …*

> *The separation of the RET scheme was vital to … creating conditions conducive to investment in large scale renewable generation. If this separation was removed, the market for large scale renewable certificates could again face distortion, jeopardising the 20% target and stymieing large scale renewable electricity generation in Australia (particularly if any new State-based policies emerged). Further, the change in RET policy, particularly to an initiative that has only recently been introduced, would undermine policy certainty and investor confidence. There have been no fundamental changes to the market dynamics which made necessary the division of the RET scheme in 2010. Accordingly there is no rationale upon which to remove this separation now. (AGL, sub.38, p.4)*

Many stakeholders expressed concern that merging the schemes would disadvantage large-scale projects, which required a greater degree of investment certainty. Hydro Tasmania submitted:

> *Any re-introduction of small-scale technologies into the LRET will almost certainly immediately stall investment in large-scale projects due to the recent experiences of certificate supply volatility and the increased market risk this would bring. (Hydro Tasmania, sub.40, p.8)*

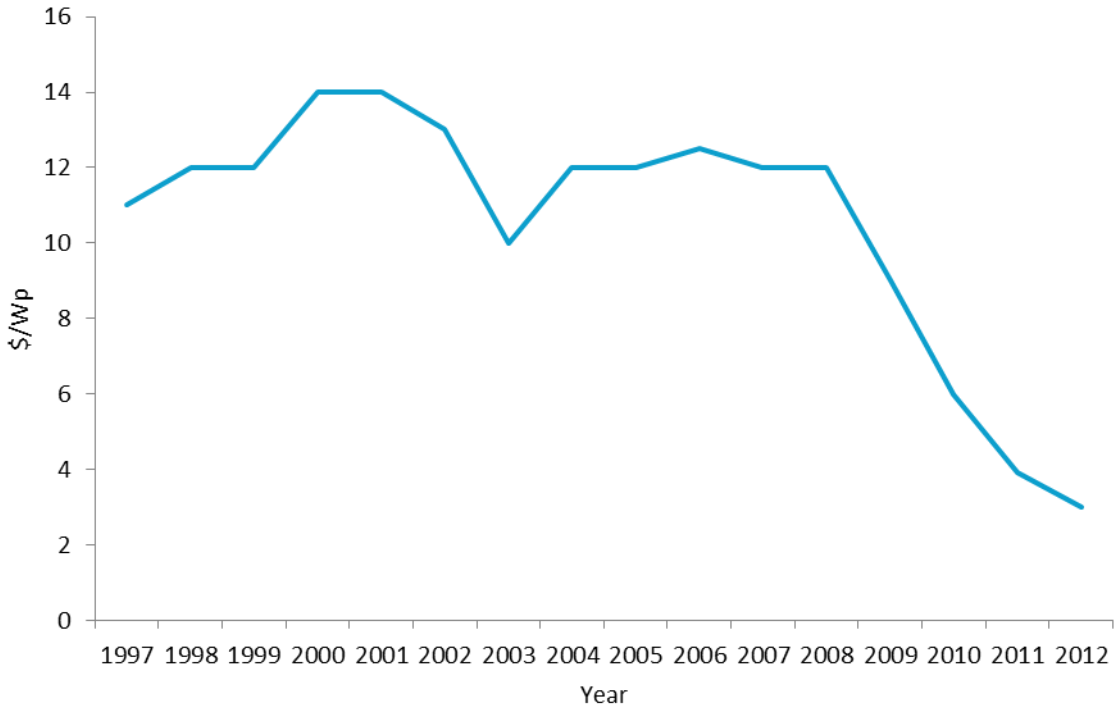
Acciona Energy expressed similar sentiments:

> *The fundamental issues which led to the separation of the large and small scale systems in 2010 remain. Any proposal to merge the systems into one market again would result in further uncertainty and suppression of demand for utility scale projects would be on going. (Acciona Energy, sub.85, p.5)*

It is difficult to predict whether large-scale or small-scale projects would be more competitive under a merged scheme. Historically, under the MRET, there was relatively low deployment of small-scale systems. However, small-scale systems became considerably more popular in 2009. While many of the factors that contributed to this rise are no longer in play (or will be removed shortly) – technology costs associated with small-scale solar PV have fallen considerably (and appear to be falling still) (see Figure 36). The effect of this is further enhanced by the strength of the Australian economy and dollar, which makes imported components more affordable. There is also now an established industry aimed at deploying small-scale systems.

It may be argued that whether a merged scheme favours large-scale or small-scale projects is immaterial from an environmental effectiveness perspective. Renewable energy generation is renewable energy generation regardless of source (provided there are no multipliers greater than one, which create certificates not based on generation). That said, it is likely that the increased regulatory uncertainty created by merging the schemes would have a disproportionately negative effect on large-scale projects, given they require greater investment certainty due to the high capital investment and lack of deeming provisions (see Chapter 9 for further explanation of deeming arrangements under the SRES).

Figure 36 Decline in grid-connect solar PV system prices 1997 - 2012



Source: Dr Muriel Watt, Australian PV Association, Clean Energy Week, 25 July 2012. http://www.cleanenergyweek.com.au/dms/cew/cew-2012/presentations/Day-one-Clean-Energy-Week-Conference/Commercialising-Large-Scale-Solar/muriel_watt/Muriel%20Watt%2C%20Chair%2C%20Australian%20PV%20Association.pdf

In conclusion, there are arguments for and against merging the LRET and SRES: the primary benefit of merging is that it is likely to impose a lower aggregate cost on society; the main disadvantages are associated with increased regulatory uncertainty and the associated investment risks, noting that these are likely to have a disproportionately negative effect on large-scale projects.

The Authority's preliminary view is that rather than attempting to 'unscramble the egg' by recombining the LRET and SRES, less disruptive ways of ensuring that the costs of the SRES can be contained should be developed – these are discussed below at section 5.3.1.

DRAFT RECOMMENDATION

R.5. The preliminary view of the Authority is that the Small-scale Renewable Energy Scheme should remain separate to the Large-scale Renewable Energy Target.

5.2.2. Lowering the Small-scale Renewable Energy Scheme threshold for solar photovoltaic

Although, in the broad, the Authority considers that the SRES should remain a separate scheme, it is continuing to explore whether there is a case for moving some small-scale systems into the LRET by reducing the threshold of small generation units in the SRES. The *Renewable Energy (Electricity) Regulations 2001* set capacity limits for eligible small generation units under the SRES. While the capacity limits for small-scale wind turbine systems and small-scale hydro systems are relatively low (10 kilowatt (kW) and 6.4 kW respectively), small-scale solar PV systems have a capacity limit of

100 kW and are still included in the SRES. This is considerably larger than the average size of solar PV systems installed in 2011 and 2012, which was approximately 2.6 kW (sourced from the Clean Energy Regulator, 30 September 2012).

To date, the vast majority of small-scale systems in Australia have been installed on residential dwellings (see Table 11). A number of participants have described as yet untapped potential for commercial deployment of small-scale systems, for example on shopping centres, storage facilities, office blocks or farms. These systems would generate a relatively high number of certificates compared to residential systems, adding to the overall cost of the SRES.

One option to limit this cost, while still providing an incentive for commercial deployment, would be to lower the capacity threshold of solar PV so that larger installations are captured in the LRET. As larger systems will typically be installed by businesses, the investment drivers are likely to be similar to those under the LRET.

Many of the disadvantages identified above with merging the schemes would not apply to lowering the solar PV capacity threshold. In particular, business models for operating in this market are only now being developed – there is no existing, established industry that would be disrupted by the change. In relation to the stability of the large scale scheme, the Authority considers that the potential for disruption from two key 'artificial' sources – multipliers and generous state and territory feed-in tariffs – are currently low.

Table 11 Photovoltaic installations by country

2011 installations by country	Installed capacity MW	Residential proportion %	Residential capacity MW
Italy	9301	8	744
Germany	7500	9	675
China	2200	27	600
US	1867	37	698
France	1634	16	261
Japan	1296	9	1166
Belgium	958	68	651
UK	899	56	503
Australia	**865**	**95**	**822**
Spain	345	5	17

Source: REC Agents Association, sub.47, p.11

Choosing an appropriate threshold will be key to minimising the risks associated with allowing some small-scale systems into the LRET. Any changes to the threshold should ideally ensure household installations remain in the SRES, but move larger installations on commercial buildings into the LRET.

The Authority is continuing to explore whether a lower threshold is appropriate, including the level of that threshold and welcomes participant views on this issue.

If the threshold were to be lowered, the Authority is considering whether changes should be made to the deeming arrangements for larger systems (that is, the number of megawatt hours of electricity that a system is 'deemed' to produce). The larger the system, the less justification there can be for long deeming periods, since the scope for inaccuracies is greater, and the additional compliance costs as a proportion of total certificate revenue created by the system is lower. For small-scale residential units,

at this stage, the Authority sees no need at present to alter the current 15 year deeming arrangements. For larger systems, the Authority is considering whether shorter deeming periods (for example, a reversion to the previous system of five year deeming stretches) would be more appropriate. The Authority welcomes views from review participants on this issue.

DRAFT RECOMMENDATION

R.6. The Authority is continuing to consider whether the threshold for a small-scale solar PV system should be reduced below its current 100 kW limit to for example 10 kW.

5.3. The design of the Small-scale Renewable Energy Scheme

This section considers potential architectural changes to the SRES to improve its operation and address some of the issues – such as cost – raised earlier in the chapter.

In particular, it considers two unique design features of the SRES: first, its uncapped nature; and second, the STC clearing house. It explores proposals to cap the SRES to contain its costs and the future role of the clearing house. More detailed administrative reforms are discussed in Chapter 9.

5.3.1. Should the Small-scale Renewable Energy Scheme remain uncapped?

Unlike the LRET, the SRES does not have a long-term gigawatt hour target. Annual liability is based on the number of certificates expected to be created that year (adding or subtracting any surplus or deficit of certificates from the previous year). In this sense, the SRES is uncapped, with liability tracking certificate creation and no potential for a long-term price signal to respond to oversupply. This was a deliberate policy choice to 'ensure small-scale installers have certainty' (Commonwealth Government 2010, p.7). In practice, the current arrangements have not provided certainty over the price received for certificates. Moreover, just as creation is uncapped, so is the overall cost of the scheme (to liable entities and, through them, electricity consumers).

The uncapped nature of the scheme has become particularly relevant because the number of installed small-scale systems has been so much higher than expected. When the SRES was legislated in 2010, it was set an 'implicit target' of 4 000 GWh of generation in 2020. It has already exceeded this target with current estimates of approximately 5 000 GWh per annum and the Authority estimates it will reach around 11 000 GWh in 2020-21, Box 9 refers.

Because the SRES is uncapped, higher than expected uptake has also led to higher than expected costs.

Box 9 Generation from the Small-scale Renewable Energy Scheme

As at September 2012, the SRES has led to the installation of approximately 860 000 solar PV systems since 2001 which the Authority estimates have the capacity to generate approximately 2 700 GWh per annum. Over the same time frame, approximately 760 000 solar water heaters have been installed, which the Authority estimates may displace around 2 300 GWh per annum. This equates to a current annual contribution of approximately 5 000 GWh per annum. (http://ret.cleanenergyregulator.gov.au/ArticleDocuments/205/RET-data-1012.xls.aspx).

The Authority's modelling indicates that by 2020-21 solar PV will generate approximately 8 000 GWh. The Authority has estimated that solar water heaters will contribute approximately 3 000 GWh by this time. This would equate to total generation and displacement from small-scale systems of around 11 000 GWh by 2020-21.

Concern regarding the cost imposition of the SRES was a theme of many submissions, particularly from large energy users and liable entities. The Energy Users Association of Australia stated:

> *The price impact to end users of renewable energy subsidies has so far been relatively muted – around 2% increases on what they would otherwise be. But this is expected to rise significantly partly as a consequence of the creation of the SRES. (Energy Users Association of Australia, sub.87, p.21)*

The NSW Independent Pricing and Regulatory Tribunal (IPART) stated:

> *The design of the SRES, combined with generous State and Territory Government financial incentives, has put the annual costs of complying with the SRES at almost twice that of the LRET. The costs of complying with the SRES were a driver of retail electricity price increases, particularly on 1 July 2011. (IPART, sub.81, p.14)*

Others, like the REC Agents Association have considered there is no need for further cost containment as the SRES is likely to stabilise in coming years and its costs will decrease:

> *The cost to consumers is expected to peak in 2012 at 2.7% of retail prices then is expected to reduce significantly over the next three years as the solar credits multiplier gets wound back to less than 1% of retail electricity prices.*
>
> *Electricity consumers will also benefit from lower wholesale electricity prices (energy component) as the level of electricity consumption has reduced due the roll out of small scale solar systems. (REC Agents Association, sub.47, p.6)*

The Authority's modelling estimates that for 2011-12 the cost of compliance with the SRES was around $1.2 billion and will cost around $395 million in 2020-21. In terms of an average electricity bill, the SRES is predicted to comprise around 2.1 per cent in 2012-13. Modelling commissioned by the Authority projects that this will drop to 0.8 per cent in 2020-21 (see Table 12). This fall is attributable to the expected drop in small-scale installations with the wind back of state and territory feed-in tariffs and the reduction of the Solar Credits multiplier. While the SRES contributes a relatively small amount to an electricity bill, in the context of rising electricity prices, any upward pressure becomes contentious.

Table 12 Contribution of SRES to retail rates (%)

Year	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
SRES	2.1%	1.8%	1.6%	1.4%	1.1%	1.0%	0.9%	0.8%	0.8%

Source: SKM MMA, *Modelling the Renewable Energy Target Report for the Climate Change Authority,* October 2012.

At the same time, technology costs of small-scale solar PV have fallen significantly (see Figure 36). This means that the upfront cost of a system is lower and, coupled with rising electricity prices, means households may have an incentive to install small-scale systems without the SRES (or in the context of a lower SRES return). Regardless of the benefits provided by small-scale systems, there is no need to provide a subsidy to households to encourage behaviour they were willing to undertake without that subsidy. Origin Energy made this point in its submission, noting:

> *Further, the twin effects of falling solar panel costs and rising retail tariffs will create a situation where the subsidy required to support distributed solar PV will continue to reduce over time. There may be a point in the latter part of this decade when such subsidies are no longer required. (Origin Energy, sub.69, p.11)*

A number of stakeholders suggested that the combination of the Solar Credits and relatively high state and territory feed-in tariffs had resulted in situations in the past where the level of subsidy provided to individuals to install small-scale solar PV was too high. As well as being economically inefficient, this also had adverse market impacts, as noted by Enviromate Commercial:

> *[The] lesson learned is that the ROI [return on investment] for domestic installation to be appropriate is around 5-8 years. Where this is exaggerated by overly generous Feed-in Schemes, with a 2-3 year ROI [return on investment], we found a boom/bust cycle ensued. This needs to be avoided in future. (Enviromate Commercial, sub.163, p.3)*

Taken together, the uncapped nature of the SRES, higher than expected costs, falling technology prices and rising electricity prices present a strong argument for including a cost containment mechanism to ensure that the overall cost of the SRES and the level of the subsidy remain appropriate. It is possible that, with accelerated reduction of the Solar Credits multiplier and the lowering of state and territory feed-in tariffs, the SRES will stabilise and there will be no need for further cost containment. However, the scheme has a history of unpredictability and it is difficult to estimate future uptake and cost with any certainty. In these circumstances, the Authority recommends a cost containment mechanism that can be exercised on a discretionary basis by the Minister in the event future costs become too high or there is evidence that a lower subsidy will suffice. The next section considers potential types of cost containment mechanisms.

Cost containment mechanisms

Stakeholders suggested several possible mechanisms for limiting the costs of the SRES, including:

- a long-term quantitative gigawatt hour cap;
- lowering the certificate price cap; and
- discounting certificates.

The costs and benefits of each is considered below. Each mechanism is considered both in terms of its effectiveness as a cost containment mechanism, as well as its ability to balance certainty and predictability for scheme participants with flexibility to respond to changing circumstances. Ideally, the

mechanism should have as small an impact as possible on investments that have already been made based on the current scheme settings.

Long-term quantitative gigawatt hour cap

A long-term cap would set a fixed gigawatt hour target for the SRES. This would limit the cost of the SRES by capping the quantity of certificates – if there was an oversupply, certificate price would fall (in the same way the LRET currently operates).

As pointed out by the Clean Energy Council (sub.12, p.18), many of the investment drivers for the SRES are different from the LRET. Small-scale systems are relatively inexpensive and households are able to respond promptly to changes in incentives. This may mean that, in the context of the SRES, a gigawatt hour cap would create a 'boom-bust' cycle. The Clean Energy Council stated:

> *If the scheme were to be capped you would see installations of small scale systems pulled forward (to avoid being outside the cap) which would create a cycle of boom and then bust, as once the cap was reached demand would plummet until the cap reset the following year. (Clean Energy Council, sub.12, p.17)*

The Ai Group expressed similar concerns in its submission, noting:

> *… in the context of the market for small-scale systems, a cap is likely to cause considerable problems and dislocation. The experience with other capped benefits, such as the former rebates for solar PV or state government grants and tariffs, is that demand spikes when the public believes that time is running out; governments often find it hard to enforce a cap; and neither government nor industry may have a clear picture of total activity or the pipeline for certificates. The risk is that the cap does not hold, and that the cap drives annual boom-and-bust cycles that damage the industry. (Ai Group, sub.46, p.16)*

A boom-bust cycle would be difficult for businesses involved in the SRES to manage. It would also create difficulties because the main participants in the small-scale scheme are households. It is unfair if non-expert participants invest on the basis of a certain set of circumstances and then discover they have missed out on the expected subsidy because the cap has already been reached and the price of certificates has plummeted. This was demonstrated with the off-grid multiplier - an extension of the Solar Credits multiplier – that gave an additional incentive to off-grid systems. The incentive was capped to a certain level of certificates each year. In the first year there was a rush to install systems to gain the incentive, which led to an oversubscription (a small-scale system must be installed before certificates can be claimed). This resulted in many applicants being unable to gain the additional incentive, leaving them significantly out of pocket. Such a situation is likely to be politically unviable for governments to maintain.

Furthermore, while introducing a gigawatt hour cap would likely limit the overall costs of the SRES, it would require a major structural overhaul, creating significant regulatory uncertainty. This will impact adversely on the small-scale industry, as well as households.

On balance, while a gigawatt hour cap would be likely to effectively contain the costs of the scheme, it would create significant regulatory uncertainty and is unlikely to provide predictability and certainty for participants. Furthermore, once the cap is set, it would be difficult to change in response to changed circumstances without significantly disrupting the market. Other cost containment mechanisms are likely to provide a better balance. For these reasons, the Authority's initial thinking is not to recommend a cap.

A ‘softer’ option for a long-term gigawatt hour cap would be to limit the small-scale technology percentage such that it could not be higher than a certain percentage. This would likely have a similar – but more muted – impact relative to a gigawatt hour cap. It also depends on accurately predicting the small-scale technology percentage, which has been notoriously difficult. On balance, a limit on the small-scale technology percentage is not proposed for similar reasons that a hard cap is not recommended.

Price cap

Another option to contain the cost of a mechanism is a price cap. This does not limit the number of certificates created (or the number of installations) but caps the price of certificates, thereby limiting the support to small-scale systems. A price cap can be lowered to control the cost of the scheme as circumstances change.

The SRES already contains a price cap – currently set at the clearing house price of $40. The *Renewable Energy (Electricity) Act 2000* (Cth) provides for a ministerial power to lower the price cap by lowering the clearing house price. At the time of enactment, the power to lower the clearing house price was considered an important cost containment tool and a way of ‘[balancing] the cost to consumers against the benefit of having a subsidy for [small-scale] technologies under the scheme’ (Commonwealth, Senate 2010). Under the *Renewable Energy (Electricity) Act 2000* (Cth), the Minister may reduce the clearing house price taking into account the following considerations:

- whether the total number of STCs created in 2015 exceeded or is expected to exceed the equivalent of 6 000 GWh;
- any changes to the costs of small generation units and solar water heaters;
- the extent to which owners of small generation units and solar water heaters contribute to the costs of small generation units and solar water heaters;
- the impact of the clearing house price, and the number of small generation units and solar water heaters installed on the electricity market, including on electricity prices; and
- any other matters the Minister considers relevant.

On the basis of these existing criteria, the Minister could act now or at any future time to decrease the clearing house price to a new and currently unspecified level. Despite the success of the SRES, the Minister has not exercised this power to date, preferring instead to accelerate the reduction of the Solar Credits multiplier (Combet, Dreyfus 2011).

The price cap currently operates effectively to ensure STCs never rise above $40. A number of stakeholders submitted that the ministerial power should be used to lower the price of STCs to contain the costs of the scheme. For example, the Power and Water Corporation submitted that:

> *… the Clearing House price for certificates must be cut substantially. Small-scale systems are becoming competitive in their own right and have been overly successful due to current support levels; therefore a reduction in their support levels is justified.” (Power and Water Corporation, sub.137, p.4)*

There are, however, a number of complexities associated with lowering the price to respond to changes in circumstances.

First, lowering the clearing house price impacts on investments that have already been made on the assumption that the price cap is $40. This was raised by the Clean Energy Council in its submission:

> *… if the $40 price were to be adjusted, the impact on the small scale technology market would be highly detrimental. Firstly, the value of STCs in the spot market would likely fall dramatically, as the expectation that the Clearing House will eventually come into play in a significant way over the next 12 to 24 months would be removed and this would lower estimates of the longer term value of STCs. Many investors from major banks to solar PV business and dedicated certificate trading businesses are holding substantial quantities of STCs. Material changes to SRES or the Clearing House could devalue those assets and undermine the viability of those businesses. As these certificate trading businesses help to provide cash flow to PV businesses anything that harms these businesses or discourage new entrants into the STC market will harm the PV sector more broadly. At the very least it would reduce the value of their asset which is unfair to them…Even seriously considering this option will have an impact on market sentiment and the value of STCs until that uncertainty is resolved. (Clean Energy Council, sub.12, p.23)*

The REC Agents Association raised similar concerns:

> *… financiers now have taken security over STCs under the Personal Property and Securities Act (2009) based on the $40 price in some instances if the STCs reside in the [clearing house]. The removal of the [clearing house] or reduction to the [clearing house] is likely to result in an event of default under such security arrangements and lead to financing issues for the parties concerned. (REC Agents Association, sub.47, p.12)*

For these reasons, the REC Agents Association proposed that the ministerial power to reduce the clearing house price be removed.

Second, lowering the clearing house price will create transitional issues for the certificates already on the clearing house transfer list. These certificates were placed on the list with the expectation that the clearing house price was $40. If the price were lowered, a decision regarding how to treat these certificates would need to be taken. Transitional arrangements could be complex and expensive.

In conclusion, the current price cap operates effectively to cap the price of certificates at $40. However, there are complexities associated with reducing it. These complexities mean it would be undesirable to regularly lower the price cap. The price cap therefore has limited flexibility to respond to changing circumstances.

For these reasons, the Authority's preliminary view is that the price cap remain at $40. The situation could be reassessed once there has been some experience of the scheme's performance following the reduction of the Solar Credits multiplier to one (on 1 July 2013) and state and territory feed-in tariffs have reduced. If significant cost containment is still required, lowering the clearing house price might be an appropriate response. If further adjustment is needed in the meantime, a discount factor could be applied to certificates.

Discounting

Discounting the number of certificates to be created in respect of each megawatt hour(that is, using a multiplier of less than one) is likely to be a more effective means of cost containment than a quantitative cap or a price cap. Discounting would mean that each certificate would represent more than one megawatt hour of renewable energy generation. For example a multiplier of 0.5 would mean that every certificate represented 2 MWh of generation. Multipliers can be an effective way of altering uptake, as demonstrated (in the converse) by the Solar Credits multiplier.

Discounting was proposed by a number of stakeholders, including the Ai Group, the Business Council of Australia and the Australian Aluminium Association. The Business Council of Australia stated:

> *One option [for containing costs of the SRES] would be to continue to reduce the multiplier being used. (Business Council of Australia, sub.140, p.7)*

Discounting would be unlikely to create the same boom-bust cycle as a quantitative gigawatt hour cap as it does not create the same incentive precipice. This was noted by the Ai Group, which commented that discounting was likely to provide a 'smoother, fairer manner' of winding back additional support for small-scale systems than a quantitative gigawatt hour cap.

Discounting also has an advantage over a price cap in that it does not affect previous investments. Lowering a price cap may disadvantage those who have invested on the basis of a previous higher price (and, in terms of the clearing house raises the issue of what to do with certificates that are already on the clearing house transfer list). Discounting, when applied in a transparent and predictable manner, would allow participants to plan for the number of certificates they will be issued. It could also be paused should uptake and costs stabilise. For these reasons, it is proposed that discounting be used as a potential cost containment mechanism, if necessary.

It would be possible to apply different discount factors to different technologies depending on their cost. This would mean that more expensive technologies would receive a higher subsidy than less expensive technologies. This approach is supported by Ai Group (sub.140, p.16), which suggests that discounting should not apply to solar water heaters given they have not experienced the same level of uptake as solar PV.

While there is some appeal to this concept, applying different discounting factors to different technologies would amount to banding. As discussed in Chapter 8, one of the core features of the RET certificate scheme is to bring forward the most cost-effective renewable energy generation, rather than encourage diversity of renewable energy technologies. Banding would most likely mean more expensive technologies are deployed, raising the overall cost of the RET. This is contrary to the reason for applying a discount factor. For these reasons – and those set out in Chapter 8 regarding banding more generally – the Authority's preliminary view is that a discount factor be applied to all technologies, including solar water heaters, equally.

A discounting factor could be two-way: for example, just as it could be adjusted downwards to contain the cost of the scheme and adjust the level of the subsidy, it could be adjusted upwards, should technology prices rise. While there are some advantages to such a system, it is not supported by the overall rationale for the RET – that is, a *transitional* measure to support renewable energy technologies. A fundamental premise of the RET is that, over time, as technology prices fall, the renewable energy industry establishes itself and a carbon price takes effect, assistance will no longer be needed. This is discussed in further detail in Chapter 3. In line with this overall objective of the RET it is proposed that the discount factor be a 'one-way downward ratchet'.

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R.7. The preliminary view of the Authority is that the price cap remain fixed at $40, to be reassessed once there is some experience of the scheme's operation in the absence of the multiplier.

R.8. The preliminary view of the Authority is that discounting (multipliers of less than one) of the number of certificates to be created in respect of each megawatt hour be provided to allow the Minister to control the cost of the SRES and ensure the subsidy level is appropriate.

Applying a discount factor – criteria to take into account

The way a discount factor is applied is important – ideally, any 'triggers' for action should be meaningful and balance:

- certainty and predictability for industry participants regarding when and how the factor will change; and
- flexibility to respond to changing circumstances, for example a sharp drop in technology costs.

The Ai Group suggested a formula be used to determine when the discount factor should be lowered. Its proposed formula is based on change in system costs and electricity prices:

$$If\ A < 1, then\ multiplier\ for\ financial\ year\ X = A, if\ A \geq 1, then\ multiplier\ for\ financial\ year\ X = 1$$

$$Where:$$

$$A = \left(\frac{Installed\ cost\ of\ solar\ PV – calendar\ year\ X – 1\ (\$/W)}{Installed\ cost\ of\ solar\ PV – calendar\ year\ 2012\ (\$/W)}\right) \times \left(\frac{Avg.retail\ electricty\ price – calendar\ year\ 2012\ (c/kWh}{Avg.retail\ electricty\ price – calendar\ year\ X – 1\ (c/kWh)}\right)$$

Using this formula, multipliers could be determined six months in advance of application based on widely observable data whose trends will be clear even earlier. The formula would be applied for 2014-15 and beyond, once the current trajectory of multiplier reductions is completed. (Australian Industry Group, sub.46, p.18)

This formula would provide certainty to industry regarding the future level of incentive. It may, however, not provide sufficient flexibility to respond to unforeseen events. The Authority's preliminary view is that there may be value in establishing a discretionary ministerial power to reduce the discount factor. Certainty and predictability could be provided by requiring that the Minister's decision is based on clear criteria and follows a transparent process.

With regard to the decision-making process, it is proposed that that the Minister reviews whether to step-down the discount factor at an established time every year – for example, at the time the small-scale technology percentage is set. If the Minister decided to reduce the discount factor, the legislation could prescribe that it would take effect at a set point in the future, for example, the beginning of the next financial year. This would allow industry participants to factor these dates – and the possibility of a reduction in the discount factor – into their forward planning. If the Minister decided to reduce the discount factor, the Minister could be required to provide reasons as to how the various criteria were weighted. Going forward, this would provide participants with a greater understanding of the factors important in Government decision-making.

The Authority is still considering which criteria would be appropriate to trigger a reduction in the discount factor. It welcomes views from review participants on this issue, particularly in relation to how criteria could be developed that are meaningful, relatively unambiguous, and can clearly lead to a proportional change in the discount rate. The Authority's early thinking is set out below.

The criteria used to guide decisions regarding a step-down in the discount factor should provide an indication regarding both the cost impost of the SRES and the level of subsidy.

A range of different criteria can be used, including: payback period, system cost, installation cost, out-of-pocket expenses and changes in the contribution of the SRES to electricity prices. Each of these criteria has benefits and drawbacks: often those which are likely to provide the most comprehensive information (for example, payback period) are also the most complex and difficult to measure. It is also important to note that any criteria will require a judgment call regarding how it links to the discount factor and when a reduction should be triggered.

A combination of criteria is likely to provide the best basis for an assessment of the state of the SRES and whether to apply or lower a discount factor. The Authority's preliminary view is that the following criteria will likely provide an indication of both the overall cost impost of the scheme, as well as the level of individual subsidy:

- payback period;
- electricity prices and the contribution of the SRES to electricity prices; and
- net cost of small-scale systems.

Both the net cost and electricity prices criteria are inputs to the payback period calculation. They are included separately because they are simpler to measure and survey; and because the electricity prices criterion provides an indication of overall cost to society. Each of these criteria is described in more detail below.

Payback period

A payback period is used to determine the amount of time it takes before the returns of an investment cover its cost. Payback for a solar PV system is calculated as the net cost of the system, divided by the net annual cash flows (savings in energy costs, plus any feed-in tariffs, less any costs associated with running the system). Box 10 provides an example of the calculation of payback period.

Box 10 Example of payback period calculation

A 1.5kW system may cost $4 000, and receive $1 000 value of STCs, making the net cost $3 000.

This same system may produce 2 MWh in a year – half of which reduces electricity use at 23 cents per kWh (escalating at 5 per cent per annum) and half of which is exported at 8 cents per kWh – equating to earnings and savings totalling to $321 in the first year.

It is also estimated a contribution of $1 000 is required every 7 years to assist with the purchase of a new inverter for the system.

By adding the annual earnings (and subtracting the cost of an inverter every 7 years), it would take 10 years before the system paid back the initial cost of $3 000.

This equates to a payback period of 10 years.

The payback period can be a useful way to make comparisons amongst multiple investments. It is also a convenient way to measure the relative benefit of an incentive. Payback period has been used by state and territory governments to set and wind back feed-in tariffs.

The drawback of using payback period for small-scale technologies is that most of the inputs for the calculation vary throughout Australia, meaning there is not a 'one size fits all' result. This can be overcome by applying weighted averages to the most popular systems in the most popular areas to ensure that analysis is complete and accurate for the majority of cases.

Calculations indicate that the current payback period is approximately ten years. Current installation data indicates the small-scale industry appears to be operating at a sufficient and sustainable rate. Therefore a ten year payback period appears to be an appropriate relationship between incentive and cost. This payback period implies a return on investment of 10 per cent which also seems to be a reasonable return compared with other investments. Therefore, 10 years appears to be an appropriate benchmark for determining appropriate incentive levels.

Electricity prices and contribution of Small-scale Renewable Energy Scheme to electricity prices

Retail electricity prices and the proportion of the bill attributed to funding the SRES provides a useful, and easily measurable, indicator of the cost of the SRES to society.

It is proposed that electricity prices, and the portion which relates to the SRES, be one of the criteria considered when applying a discounting factor. Considering the current and projected cost contribution of the SRES (see Table 12, p.89), 1.5 per cent appears to be an appropriate middle ground. It is clear from submissions that many stakeholders consider the current contribution of 2.1 per cent as too high. Based on this, the Authority considers an SRES contribution of around 1.5 per cent of an average electricity bill to be sustainable.

Net system costs

The net system cost is the total system cost less any discounts or upfront incentives received. It is also known as the out-of-pocket expense.

The benefit of using this figure is that it is relatively uncontentious as it is simple to calculate and understand. The Clean Energy Council has advised that out-of-pocket expenses (or net system cost) is a key factor in the decision to install a small-scale system.

It is proposed that net system costs be observed over a six month period to see the change in system prices. This may indicate a trend in the out-of-pocket cost to consumers and assist the Minister when deciding to apply a discounting factor. As it is an average figure there will always be exceptions to the result.

DRAFT RECOMMENDATION

R.9. The preliminary view of the Authority is that a decision to apply or lower a discount factor should be applied in the following manner:

- The Minister should consider whether to lower the discount factor at the time the small-scale technology percentage is set each year.
- The Minister's decision should be based on, and proportional to, the following criteria: (i) any reduction in net system costs over the last year; (ii) electricity prices and whether the SRES contribution is greater than 1.5 per cent; and (iii) whether the average payback period of a small-scale system has fallen below ten years.
- In making the decision, the Minister should obtain and take into consideration independent data surveys regarding the above criteria. The survey results should be published.

If the Minister decides to lower the discount factor, the Minister should provide reasons regarding the weighting of each element.

Feed-in tariffs

State and territory feed in tariffs have a significant impact on the uptake of small-scale systems. Although most state and territory feed-in tariffs are now comparable to wholesale prices, it is possible that a state or territory may choose to increase its tariff in the future. It would be useful for there to be some coordination regarding state and territory feed-in tariffs.

The Council of Australian Governments' Standing Council on Energy and Resources is considering the merits and options for developing guidelines for a consistent national approach to fair and reasonable feed-in tariffs for small-scale renewable generation. Any such guidelines would aim to encourage competition, provide clear rights and obligations around the terms of connection and what constitutes a fair and reasonable return for a small-scale system.

5.3.2. The clearing house

The 'STC clearing house' is a voluntary mechanism designed to facilitate the exchange of STCs between buyers (i.e. liable entities) and sellers (owners or agents) at a fixed price of $40. Sellers may enter their STCs on the 'transfer list'. The list clears as buyers purchase STCs from the clearing house. If there are no STCs listed, the Clean Energy Regulator will create an STC, which will be replaced with the next certificates to be entered on the transfer list. While the clearing house provides a set price per STC, there is no guarantee how long it will take to sell the STC.

The clearing house was designed to fulfil two purposes: to cap the price of certificates for liable entities (Explanatory Memorandum 2010) and to deliver a set subsidy of $40 per STC for households, small businesses and community groups (Department of Climate Change and Energy Efficiency 2010).

The clearing house operates as a price cap by allowing liable entities to acquire a limitless amount of certificates from the clearing house for the set price of $40. If there are no certificates on the transfer list, the Clean Energy Regulator will create certificates to sell to liable entities. These 'regulator-issued' certificates are replaced with the next 'real' certificates that are listed in the clearing house. The price cap role played by the clearing house is an important cost containment mechanism given the SRES has no quantitative cap.

While the clearing house has provided an effective price cap, it has failed to deliver a set subsidy of $40 per STC to owners of small-scale systems (or their agents). The clearing house is a voluntary mechanism and liable entities have chosen to acquire certificates outside the clearing house where STC spot prices are around $25 to $32 – see Figure 37. This has meant the clearing house transfer list has not cleared for 18 months (the last sale was on 25 February 2011).

Figure 37 Small-scale Technology Certificate spot price

Note: In nominal prices.
Source: The Green Room - Next Generation Energy Solutions (NGES)

Although the Government has never guaranteed a timeframe for clearance (and this is made clear on the Clean Energy Regulator's website), the existence of the clearing house has created an expectation among some non-expert participants that a $40 set price per STC is obtainable. The Authority has received several submissions from individuals who have installed small-scale systems anticipating $40 per STC, but whose certificates have yet to clear – sometimes for a considerable period of time.

There are a number of possible amendments to the clearing house that may address this issue and improve the operation of the SRES, including:

- amending the clearing house so that it is compulsory and therefore delivers the set $40; and
- abolish the clearing house and use the shortfall charge as a price cap; and
- amend the clearing house to be a 'deficit sales facility'.

These are considered in turn.

Amend the clearing house to be compulsory

A number of stakeholders proposed making the clearing house compulsory to '[stop] the market under-cutting [the clearing house price] and restore the price to a set $40 per STC' (Robin Morgan, sub.1, p.1). When designing the scheme, a compulsory clearing house was considered (Commonwealth Government 2010). It was decided it should be voluntary on the grounds that it provided greater

flexibility to liable entities – this remains a valid consideration. Importantly, making the clearing house compulsory would most likely increase the cost of the SRES and, given that cost is one of the primary concerns with the scheme, the preliminary view of the Authority is to not recommend this course of action.

If the objective is to establish a set subsidy for small-scale systems, other policy mechanisms - such as feed-in tariffs or rebates - are more directly able to achieve this result, than a certificate trading scheme. However, it is not clear that a set subsidy is needed to drive the installation of small-scale systems. Installation of small-scale systems has successfully continued, despite fluctuating certificate prices of $20-$30 since the inception of the SRES.

Abolish the clearing house

Another option is to abolish the clearing house. This would effectively remove the 'promise' of a $40 set price, pushing all activity onto the secondary market. This would have the advantage of removing the unrealistic expectation regarding the attainment of $40 per STC.

Abolishing the clearing house may also have some benefits in terms of administrative savings. However, these are likely to be small. The largest cost associated with the clearing house was its establishment; its ongoing operating costs are relatively low.

At face value, abolishing the clearing house may not impact adversely on the market: there is a lively secondary market and many householders now interact with the scheme through agents, (particularly given the clearing house does not deliver prompt payment for certificates). However, the Clean Energy Council stated that the clearing house is likely to play a more active role in the SRES as the scheme stabilised:

> *While the Clearing House has not necessarily played the role it was intended to play as part of the SRES, it is nevertheless now an important part of the scheme. The challenges in forecasting the uptake of small scale systems has limited the extent to which the clearing house has played an active role in the market to date.*
>
> *… the Clearing House should remain in place and will over time play an increasing active part in the functioning of the SRES. If the Clearing House were to be changed or abolished … the impact on the small scale technology market would be highly detrimental. (Clean Energy Council, sub.12, p.23)*

Abolishing the clearing house would require transitional arrangements to be put in place for certificates currently on the transfer list. This is likely to be complex and expensive.

Further, abolishing the clearing house would raise the question of how to cap the scheme price. This could be done through the shortfall charge (which could be lowered to a tax-effective rate of $44). There are, however, a number of disadvantages to using the shortfall charge as a price cap. First, it is easier to lower the clearing house price. Lowering the shortfall charge would require an amendment to primary legislation, whereas the clearing house price can be lowered through a legislative instrument, which has a less onerous parliamentary process. Second, the clearing house may also have advantages over the shortfall charge from a reputational perspective. Liable entities may be more willing to access a price cap in the form of set-price certificates from the clearing house than pay the shortfall change, which may carry connotations of non-compliance. Finally, there may be benefits to the clearing house price over the shortfall charge in terms of environmental effectiveness. The 'regulator-issued' certificates are eventually replaced by real certificates representing one megawatt hour of

renewable generation. Payment of the shortfall charge, however, is simply the payment of a tax and does not directly lead to any additional renewable energy generation.

Amend the clearing house to a 'deficit sales facility'

The clearing house could be amended to a 'deficit sales facility', whereby new certificates are only allowed to be entered on the transfer list when the clearing house is in deficit (i.e. when the Clean Energy Regulator has issued certificates to liable entities).

This would retain the clearing house as the price cap and all the associated advantages. It would, however, be clear to participants that the clearing house cannot guarantee a set price per STC. This arrangement would essentially do away with the transfer list, certificates would clear through the clearing house on a 'first come, first served' basis as soon as the clearing house went into deficit. Participants who did not go through the clearing house would not be significantly disadvantaged because the secondary market price would most likely also be high if the clearing house were in deficit.

The Authority's preliminary view is that a deficit sales facility would most likely provide the most advantageous option. It would allow the continued operation of the clearing house as a price cap, while making it clear that it cannot guarantee a set price for certificates. Such an amendment would also allow the clearing house price to be more easily amended as there would not need to be transitional arrangements put in place for certificates on the transfer list.

DRAFT RECOMMENDATION

R.10. The preliminary view of the Authority is that the clearing house should be amended to a 'deficit sales facility' whereby new certificates may only be placed on the transfer list when the clearing house is in deficit.

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CHAPTER 6. LIABILITY AND EXEMPTION FRAMEWORK

This chapter considers the liability framework for the Renewable Energy Target (RET), including which entities are liable, the calculation of individual liability, the surrender timetable for certificates and the shortfall charge. It also explores the exemption arrangements, including the self-generator exemption and the partial exemption for emissions-intensive, trade-exposed (EITE) industries.

The RET creates demand for renewable energy by requiring certain entities to surrender a set number of certificates – each equal to one megawatt hour (MWh) of renewable energy generation for compliance purposes – each year. If an entity does not surrender a sufficient number of certificates, it must pay an administrative penalty (a shortfall charge). The scheme also creates a number of exemptions from this liability – for EITE businesses and self-generators.

As it is currently structured, the liability and exemption framework does not affect the overall level of renewable energy generation, but it does affect which entities – and energy consumers – bear the cost of subsidising renewable energy generation. This raises important issues regarding economic efficiency and equity.

This chapter discusses the following issues:

- the point of liability, including the grid threshold level (section 6.1.1);
- how individual liability is calculated through the application of the renewable power percentage (RPP) and small-scale technology percentage (STP) (section 6.1.3);
- the surrender timetable for certificates under both the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES) (section 6.2);
- the operation and level of the shortfall charges (section 6.3);
- the partial exemption provided to EITE industries and the operation of the associated certificate arrangements (section 6.4.1); and
- the exemption for self-generators (section 6.4.2).

6.1. The liability framework

The liability framework determines which entities must acquire and surrender certificates. The *Renewable Energy (Electricity) Act 2000* defines liable entities as those that make a 'relevant acquisition of electricity', where a relevant acquisition refers to electricity acquired from the wholesale market (for example, from the National Electricity Market) or where an end-user acquires electricity directly from a generator. In practice, liable entities are primarily electricity retailers. An acquisition is not relevant if the electricity was delivered on a grid with a capacity of less than 100 megawatts (MW).

Individual liability is determined by applying a percentage (set annually by the Minister) to an entity's total electricity acquisitions for that year. Entities acquit their liabilities by surrendering the required

number of certificates to the Clean Energy Regulator by February of the following year. If a liable entity does not surrender a sufficient number of certificates, it must pay the shortfall charge.

6.1.1. Liable entities and calculating individual liability

As described above, an acquisition of electricity is not liable under the RET if the grid from which the electricity was acquired has a capacity below 100 MW. The Renewable Energy Sub Group's 2012 report to the Council of Australian Governments' *Review of Specific RET Issues* explains the rationale for these settings, noting (p. 41):

> *To minimise costs of compliance and administration, liability under the RET is imposed on wholesale acquisitions of electricity, mainly by retailers who are best placed to manage RET liabilities … To reduce compliance and administrative costs, grids of less than 100 MW capacity are exempt from liability.*

The current settings for the point of liability and the 100 MW grid capacity threshold were not widely commented on in submissions. However, one submission that did advocate change was provided by the Northern Territory's Power and Water Corporation, who argued:

> *The 100 MW threshold was established in 1997 when the design of the [Mandatory Renewable Energy Target] was being developed. Natural growth in electricity demand due to population growth alone has been about 3 [per cent] per annum in the Northern Territory during the past 15 years. It is therefore suggested that the threshold be revised to 200 MW or at least 150 MW. No retrospectivity is suggested for this proposal (Power and Water Corporation, sub.137, p.2).*

The submission was provided in the context of the Northern Territory's electricity infrastructure, which includes several island electricity networks that could approach the 100 MW threshold.

The Authority's preliminary view is that increasing the grid generation threshold to match growth in population and aggregate electricity demand would reduce the economic efficiency of the RET. The threshold should be set to ensure an appropriate balance between ensuring broad coverage of electricity under the RET and the general capacity of liable entities using the grid to comply with RET liabilities. Increasing the grid threshold would reduce the coverage of generation by the RET, increasing the burden faced by those that remained liable (the desirability of a broad tax base is discussed in section 6.4).

The Authority's preliminary view is that the liability definitions and thresholds generally appear to be functioning effectively. Liability and threshold arrangements have been in place since the commencement of the Mandatory Renewable Energy Target (MRET) in 2001 and liable entities are accustomed to them and have established systems and practices for compliance.

DRAFT RECOMMENDATION

R.11. The preliminary view of the Authority is that there should be no changes to the primary point of liability or the size threshold for coverage of grids.

6.1.2. Opt-in liability arrangements

A number of stakeholders proposed allowing large electricity users to 'opt-in' to manage liability under the RET for the electricity they consume. For instance, the Australian Industry Greenhouse Network stated in its submission that an opt-in scheme would provide for:

- *Market liquidity: through increasing the number of buyers and (possibly) sellers that are covered under the RET, leading to lower cost of compliance and efficient market outcomes*
- *Flexibility: for energy users to evaluate the most cost efficient solution to manage their obligations under the RET. Large energy users should be able to evaluate how to best manage their aggregated liabilities to minimise the net cost to their business (Australian Industry Greenhouse Network, sub.164 p.6).*

Stakeholders supporting opt-in arrangements also noted other potential benefits. The Climate Markets and Investment Association submitted that:

> *Market participants have already started decoupling electricity and REC costs during the development of Power Purchase Arrangements (PPA). However, the current arrangement which mandates the wholesale purchaser of electricity to manage the RECs for all liable entities makes decoupling more difficult to agree. The ability for liable entities to opt-in would remove this complexity (Climate Markets and Investment Association, sub.94, p.2).*

The Association also noted that:

> *The limited number of wholesale market participants impacts the liquidity of the RET. The ability for liable entities to opt-in would create greater market liquidity and also provide project developers a greater range of participants with which to agree a PPA (Climate Markets and Investment Association, sub.94, p.2).*

The Authority considers that key design features that need to be put in place for an opt-in scheme would include:

- specification of which entities are eligible to opt-in (for example, size threshold, type of consumer or other criteria for participation);
- administrative processes to create a liability to surrender certificates for the relevant supply of electricity for the consumer, and removal of liability for that supply from the electricity supplier;
- requirements for measurement, reporting and verification of electricity consumption by the opted-in entity; and
- processes for the surrender of units by the opted-in entity.

The additional flexibility provided by opt-in arrangements may have advantages from an economic efficiency perspective. In some circumstances, electricity suppliers may have a reduced incentive to seek out opportunities for least-cost compliance with RET obligations as they are be able to pass-through RET costs to consumers. Allowing electricity consumers to opt-in would allow the party that has the clearest incentive to minimise costs of RET compliance to source and purchase certificates. This should encourage cost-effective compliance and reduce the overall costs of the RET. For similar reasons, opt-in arrangements have been allowed in other certificate-based schemes, such as the carbon pricing mechanism and the New South Wales Greenhouse Gas Reduction Scheme (GGAS).

In terms of disadvantages, opt-in arrangements would lead to increased administrative and compliance costs associated with measurement, reporting and verification. It would also potentially increase

uncertainty for existing liable entities regarding their own liability. These costs could be at least partly addressed through the design of the opt-in arrangements. For instance, by setting a sufficiently high participation threshold to ensure that the number of additional participants is manageable, and by requiring a sufficient period of notice of intention to opt-in to provide certainty for existing liable entities.

Measurement and verification arrangements to determine energy user liability are likely to be a particular issue for opt-in arrangements at large electricity users that do not always have appropriate metering arrangements in place. Furthermore, losses on distribution networks would need to be accounted for. An electricity retailer makes liable wholesale acquisitions of electricity at a different point on the supply network from the consumer of the electricity, with network losses occurring in between. These issues have however, been successfully managed in other schemes, such as GGAS (see Box 11), although these arrangements may not map directly to the RET.

Box 11 GGAS opt-in arrangements

In the GGAS, large consumers of electricity were allowed to opt in to assume scheme obligations for meeting emissions intensity benchmarks from liable electricity suppliers. To measure the amount of electricity consumption that is opted-in the GGAS used metering points with national metering identifiers administered by the Australian Energy Market Operator. The GGAS administrator received reports of annual electricity consumption at the relevant meters from both the electricity user and the retailer. In practice both parties relied on electricity sales data, and resolution of any discrepancies did not prove difficult. The GGAS had around 32 default liable entities and 12 opted-in participants, and administration of reporting and verification under the GGAS was estimated to take approximately one month for two full time staff.

On balance, the Authority's preliminary view is that the benefits of providing for opt-in liability arrangements are likely to outweigh the costs if appropriately designed. The Authority proposes to continue to work with relevant participants and the Clean Energy Regulator to develop a workable model for opt-in arrangements.

DRAFT RECOMMENDATION

R.12. The preliminary view of the Authority is that large electricity consumers should be able to opt in to assume direct liability for Renewable Energy Target obligations. The Authority will consult further with participants and the Clean Energy Regulator on a workable model for opt-in arrangements.

6.1.3. Calculating individual liability

The annual Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES) targets are divided among liable entities on the basis of their market share. This is done through the application of a defined percentage to an entity's annual liable electricity acquisitions. These percentages are known as the Renewable Power Percentage (RPP) for the LRET and the Small-scale Technology Percentage (STP) for the SRES. For example, an entity's liability under the LRET will be:

RPP/100 x liable electricity acquisitions = number of certificates an entity must surrender that year

Liable entities are able to calculate their accumulated liability at any point in the year; however, their total liability can only be known at the end of the period when their exact electricity acquisitions for the entire year are known.

The RPP and STP are set annually no later than 31 March by the Minister in the *Renewable Energy (Electricity) Regulations 2001* (Cth), and apply to the calendar year in which they are set. When determining the RPP, the Minister must take into consideration:

- the LRET gigawatt hour target for that year;
- the estimated total electricity sold on liable grids for that year;
- any surplus or deficit of certificates from previous years; and
- the amount of all partial exemptions.

The STP is set based on similar considerations except, rather than the LRET gigawatt hour target, the expected number of certificates to be created in the coming year is relevant. This essentially means that liability under the SRES tracks certificate creation – see Chapter 5 for further explanation.

The RPP for 2011 was 5.62 per cent (approximately 10 400 000 Large-scale Generation Certificates (LGCs)) and for 2012 is 9.15 per cent (approximately 16 763 000 LGCs). Annual fluctuations in the RPP are due largely to changes in the annual LRET target.

The STP for 2011 was 14.80 per cent and for 2012 is 23.96 per cent. STP fluctuations are due to changes in the forecast number of certificates that are expected to be created and adjustments for any difference (surplus or deficit) between the forecast and actual certificate creation figures from the year before. Certificate creation in 2011 was greater than expected meaning the 2012 STP had to be set higher to account for the resulting surplus.

6.1.4. Timing of publication of the renewable power percentage and small-scale technology percentage

In submissions a number of liable entities and large energy users proposed changing the timing of the publication of the RPP and STP to before the commencement of the year. As noted above, the percentages must be set by 31 March of the compliance year, after liable entities have acquired a quarter of the electricity to which the percentage applies. Ideally the percentages should be set before the start of the compliance year so that liable entities know the percentages before they begin making the wholesale electricity purchases to which they apply.

Many liable entities and large energy users commented on this issue in submissions and proposed that the RPP and STP be published prior to the commencement of the year. These stakeholders noted that earlier publication would reduce risks, facilitate planning for compliance with liabilities, and allow consumers to enter into price pass-through arrangements with electricity retailers prior to the commencement of the year. For instance, Qenos Pty Ltd stated that:

> *LRET and SRES liability is not finalised until 31 March each year. This makes it more difficult for a company to accurately determine its likely RET costs and introduces greater risk for liable entities. This higher risk generally results in higher costs, via the imposition of risk premiums of RET liability. This risk could be reduced, and companies would be able to better manage their RET obligations if the relevant percentages were able to be declared at or before the beginning of each calendar year (Qenos Pty Ltd, sub.60, p.5).*

Similarly, the Major Energy Users Inc. stated that:

> *Setting the RPP 3 months into the year in which it applies, provides no ability for incorporation into cost budgets. It would be more use if the RPP was set prior to the start of the year in which it applies to allow consumers to build the cost into its future budgets (Major Energy Users Inc., sub.103, p.20).*

The timing of the RPP and STP requires balancing certainty for industry participants with the accuracy of the percentages. The RPP and STP are based on forward estimates of a number of factors – including estimated amount of electricity that will be acquired in relevant acquisitions and the estimated amount of all partial exemptions. They also rely on some inputs from the previous year, such as the surplus or deficit of Small-scale Technology Certificate (STC). The earlier the RPP and STP are set, the less accurate they are likely to be and these inaccuracies will need to be accounted for in the next year's percentages.

The RPP is able to be predicted with a relative high degree of accuracy. The non-binding estimates published by the Clean Energy Regulator the preceding November have been within approximately 0.1 per cent of the actual. The STP is harder to predict with accuracy, as it involves the estimation of more variables, with a key area of uncertainty being the forward estimate of the number of small-scale certificates likely to be created in the coming year. However, this factor is inherently difficult to estimate, regardless of timing. The Clean Energy Regulator advised that there would be only a small loss of accuracy if the RPP and STP were set earlier, provided this was not before November of the preceding year.

The Authority's preliminary view is that it is desirable from an economic efficiency perspective to increase certainty for business decision making in the short term and to facilitate the making of commercial arrangements before the commencement of the compliance year. To ensure that a relatively high degree of accuracy is maintained, it is proposed that this occur by 1 December of the previous year. In light of this, the Government may also wish to consider whether to continue setting the RPP and STP in regulations, which can have relatively long lead times, or whether another instrument such as a determination, may be sufficient to set the RPP and STP.

DRAFT RECOMMENDATION

R.13. The preliminary view of the Authority is that no changes be made regarding the process for calculating individual liability.

R.14. The preliminary view of the Authority is that the renewable power percentage and small-scale technology percentage should be required to be set prior to a compliance year, and preferably by 1 December of the preceding year.

6.2. Certificate surrender

Liable entities acquit their annual obligation by surrendering the required number of certificates to the Clean Energy Regulator.

Under the LRET, surrender occurs annually as part of a liable entity's annual 'energy acquisition statement', which must be submitted on or before 14 February. The statement allows the Clean Energy Regulator to confirm that the entity has surrendered the appropriate number of certificates to meet its obligations. If the liable entity does not surrender the number of certificates required, a shortfall charge applies to the outstanding amount.

Surrender occurs quarterly under the SRES. The surrender is weighted toward the first quarter with a surrender requirement of 35 per cent of the STP, followed by 25 per cent in the second and third quarters. The last quarter is around 15 per cent although this may vary as the liable entities' actual electricity acquisitions are now known and there is a need to true-up in this quarter. According to the *Enhancing the Renewable Energy Target Discussion Paper*, the rationale for this approach was to provide more regular cash flow to certificate holders (Commonwealth Government, 2010). This was considered necessary as, if certificates cleared at a set price through the clearing house, there would be no impetus for liable entities to make regular acquisitions of small-scale certificates.

The difference in the LRET and SRES surrender timelines raises the question of whether there is value in aligning them and, if so, whether annual or quarterly surrender is to be preferred. The advantage of annual surrender is that it reduces the compliance burden on liable entities. The disadvantage is that certificate holders must wait longer to sell their certificates; more regular surrender provides more regular cash flow to certificate holders.

Several submissions were received regarding a possible alignment of LRET and SRES surrender timelines. Qenos supported annual surrender of small-scale certificates on the basis that quarterly surrender adds to administrative costs, and that requirements to determine quarterly surrender based on the previous years' consumption can create difficulties where electricity consumption varies significantly from year to year. However, other stakeholders advised that the quarterly surrender under the SRES was essential for small businesses, which were unable to support the cash costs of delayed payment. Given these considerations, it seems appropriate to maintain the quarterly surrender timeline.

Meridian Energy Australia and Infigen Energy supported implementing quarterly surrender under the LRET. Meridian's submission stated that:

> *Forward prices for LGCs, with LGCs primarily being sold forward or through long-term off-take arrangements, tend to be set in a manner that reflects current spot LGC prices. Where the LGC spot price is suppressed or inflated during period of low liquidity, the LGC forward price will be similarly suppressed or inflated. Market participants with cheap access to cash can drive spot price outcomes through relatively small trades, in a manner which moves forward prices, in order to achieve more favourable pricing on larger contracts for forward delivery. For example, a well-positioned participant might deflate (inflate) spot prices in order to buy (sell) large forward volumes at deflated (inflated) pricing.*
>
> *Amending the LRET such that LGCs are surrendered on a quarterly basis (with an annual shortfall assessment in the same way that STCs are surrendered) would eliminate these anomalies and market inefficiency (Meridian Energy Australia, sub.159, p.14-15).*

It is the preliminary view of the Authority that annual surrender of STCs is likely to have a greater negative impact upon small technology businesses and owners that have less ability to manage fluctuations in cash flow than larger projects and entities, so no changes in STC surrender are proposed. Similarly, given the potential for additional compliance costs for quarterly surrender of LGCs, and in light of the limited objections that have been received about the current approach of annual liability, the Authority's preliminary view is that it is appropriate to retain the current annual surrender timeframe for the LRET.

DRAFT RECOMMENDATION

R.15. The preliminary view of the Authority is that the current arrangements for surrender of certificates (annual surrender for the Large-scale Renewable Energy Target; quarterly surrender for the Small-scale Renewable Energy Scheme) should be maintained.

6.3. Shortfall charge

If a liable entity does not surrender the number of certificates required under the LRET or the SRES, a shortfall charge applies to the outstanding amount. The shortfall charge for both the LRET and SRES is fixed at $65 per MWh. Costs incurred by purchasing certificates are tax deductible, while the payment of the shortfall charge is not. Therefore, liable parties could purchase certificates up to a price of around $93, assuming a company tax rate of 30 per cent, before they were financially worse off than paying the shortfall charge.

The shortfall charges are not indexed, and therefore fall in real terms over time. This was a deliberate policy decision, reflecting the nature of the RET as a transitional measure to bridge the gap between fossil fuel and renewable energy costs in the short- to medium-term. It is expected that as the cost of renewable energy technologies decline, and the carbon price increases, it will allow renewable energy technologies to compete in their own right.

Stakeholders who commented on the level of the shortfall charge in their submissions had varied opinions on whether the current shortfall charge was appropriate. The Clean Energy Council, Climate Markets and Investment Association, and Windlab Systems Pty Limited were all of the opinion that the current shortfall charge was appropriate. Infigen Energy further advised that:

> *The current tax effective shortfall penalty price of $92.86 [per] MWh is appropriate and sufficient to enable the 41,000 [gigawatt hour] renewable energy target to be achieved – as long as investors and the industry have confidence that the LRET target will not be reduced or stretched out (Infigen Energy, sub.111, p.6).*

The Authority also received a number of submissions suggesting the current shortfall charge was either too high or too low. Major Energy Users Inc. stated in its submission that:

> *Historically, forecasts for the cost of providing renewable energy in the future show that renewable energy could cost much the same as non-renewable generation by 2030. This implies that the future cost of LGCs could fall from current levels. On this basis, the shortfall charge is probably too high (Major Energy Users, sub.103, p.20).*

By comparison, CleanSight Pty Ltd and LMS Energy Pty Ltd advocated for a higher shortfall charge which is increased annually to account for inflation so that in real terms the level of the shortfall charge stays the same.

Whether the shortfall charges are set at the appropriate level depends on their desired role. A shortfall charge potentially performs two functions:

- first, as a penalty for non-performance of surrender obligations; and
- second, as a price cap to limit the overall cost of a scheme or mechanism.

If the charges are set very high they will not operate as a price cap in practice as it will rarely be more financially attractive to pay the charge than to purchase certificates.

If the shortfall charges operate as a price cap, they have the advantage of reducing price uncertainty for liable entities and ensuring the costs of the scheme are contained. It also makes explicit the Commonwealth Government's policy response in the event of extreme pricing outcomes. For example, if the price rises, there will become a point where it is politically infeasible for the Government to continue to impose the cost and a price cap provides an explicit indication of where that point is and the response.

The disadvantage is that the amount of renewable energy generated is reduced if liable entities choose to incur shortfall charges rather than purchasing certificates from eligible generators.

To date, the price of certificates has never risen above $93 and therefore the shortfall charges have only been used when entities have mismanaged their liability or lacked sufficient funds to purchase certificates. Even if the price of certificates were to rise above $93, entities may choose to acquire certificates, rather than pay the shortfall charges, for reputational reasons.

At its current level, the shortfall charge operates more as an administrative penalty, rather than a price cap. It is high enough to dissuade entities from accessing it on a regular basis. However, it also provides a 'safety valve' that can be accessed in unforeseen circumstances (for example, in the event of a short-term lack of supply or finance).

The modelling work commissioned by the Authority indicates that the price of certificates is not expected to increase to a level where the LRET shortfall charge would operate as a price cap (see Chapter 4).

The Authority's preliminary view is that the shortfall charge is set at an appropriate level given the current policy context. However, in the event that the carbon price or electricity demand is significantly lower than currently anticipated, there is a risk that the shortfall charge would not be high enough to encourage compliance, in which case the 2020 target of 41 000 GWh would not be met. The Authority will consider these issues in its 2016 review or earlier if circumstances warrant it.

DRAFT RECOMMENDATION

R.16. The preliminary view of the Authority is that the current settings for the shortfall charges should be maintained. However, the level of the shortfall charge should be reconsidered by the Authority as part of its 2016 review of RET targets beyond 2020, or earlier if circumstances warrant it.

6.4. Exemptions

There are two forms of exemptions under the *Renewable Energy (Electricity) Act 2000*. The first is a partial exemption for EITE activities; the second relates to self-generation (that is, where the end-user and generator are the same entity).

From an economic efficiency perspective, exemptions are, generally speaking, undesirable. The RET can be viewed as a tax to support the development of the renewable energy industry. In this scenario, liable entities represent the tax base. As a general rule, broadening the tax base is usually more economically efficient as it decreases the distortions in the market. If the cost burden is spread more broadly, each liable entity's obligation is smaller. A broad based tax may also be more equitable, as it does not, on its face, advantage any particular group.

This does not mean that exemptions should never be granted. Exemptions may be justified on the basis of public interest, equity, administrative practicality (e.g. excessive administration and compliance

costs) or economic efficiency, if applying the 'tax' evenly creates specific circumstances that disadvantage a particular class of entities.

It should be noted that, as they are currently framed, the exemptions do not affect the environmental effectiveness of the RET scheme. The exemption framework does not change the overall number of certificates required to meet the obligations of the scheme and therefore does not impact on the amount of renewable energy delivered by it. Instead, the effect of the exemptions is to shift the responsibility for surrendering those certificates to those electricity purchases that remain liable. Thus, analysis of the exemption framework tends to focus less on environmental effectiveness and more on other relevant principles, such as economic efficiency and equity.

Each exemption under the RET scheme is considered in more detail below.

6.4.1. Emissions intensive, trade exposed activities

Businesses carrying out eligible EITE activities may apply annually for a Partial Exemption Certificate (PEC) under the RET. These exemptions were introduced in 2009 when the RET was expanded, and took force in 2010.

The general rationale for providing assistance to EITE activities is that these businesses are competing in an international setting where their competitors do not face a similar impost. EITE businesses are unable to pass on the additional cost of the RET to their customers, to remain competitive, and must absorb the additional cost of the RET. This may cause EITE businesses to move the activity to a country that does not have a RET (or other such cost imposition). Such a result would not serve the objectives of the RET.

The partial exemption framework under the RET is similar to, but not the same as, the Jobs and Competitiveness Program (JCP) under the carbon pricing mechanism. The information and data required to determine the assistance are largely the same – for example, the same list of EITE activities applies and the energy and production data required is the same. However, the resulting exemption is calculated differently. This is primarily because the RET exemption focuses on electricity use, as opposed to emissions.

The RET partial exemption framework works by first identifying EITE activities. Eligible trade-exposed activities are assessed for their overall emissions intensity on the basis of historical data, regardless of the extent to which those emissions are related to electricity use. Activities that are classified as highly emissions-intensive receive an assistance rate of 90 per cent under the RET. Activities that are assessed as moderately emissions-intensive, receive an assistance rate of 60 per cent under the RET. There are currently more than 30 eligible EITE activities, including aluminium smelting, integrated production of lead and zinc, manufacture of newsprint, carton board manufacturing and petroleum refining.

An EITE business can apply to the Clean Energy Regulator for a PEC. The Clean Energy Regulator calculates the value of the PEC taking into account the assistance rate and a range of other inputs including:

- electricity use per unit of output for the activity – each activity has a specified electricity baseline, the value of which is predetermined from historical data and is set in the Regulations;
- output – the quantity of relevant product is submitted to the Clean Energy Regulator by the EITE organisation every year; and

- proportion of electricity use from a given site that is related to the EITE activity and thus could be eligible for a PEC – this is only relevant if multiple activities or processes are carried out on the one site.

The EITE exemption is substantial, with around 27.5 million PECs issued in 2011, equal to approximately 13 per cent of the total of relevant acquisitions of electricity for the RET in 2011. This equates to approximately $172 million at the average 2011 price of $39 per LGC and at a rough price of $27.5 per STC. The EITE exemption will result in increased costs for other RET liable entities. As a rough guide, dividing the value of this exemption by an estimate of approximately 180 million MWh of RET liable generation in 2011, the exemption would have been expected to add approximately $0.95 per MWh to the price of non-exempt electricity consumption.

The existence and level of the EITE exemption

The Authority received around 20 submissions that raised particular concerns regarding the current level of the EITE partial exemption. A number of submissions stated that the RET places a substantial burden on EITE industries that are struggling to remain viable in current economic conditions, and emphasised the importance of continuing or expanding the current exemptions for those industries to maintain viability. For example, the Australian Aluminium Council stated that**:**

> *…even with the existing exemptions, RET costs the aluminium industry approximately $80 million per annum or $40 per tonne of aluminium at a time when the Australian aluminium industry is loss making and the viability of most facilities is under question and requiring severe cost reduction strategies in order to survive (Australian Aluminium Council, sub.73, p.8).*

Conversely, a small number of submissions supported reviewing exemptions and reducing or removing them if appropriate. For instance, the Australian Network of Environmental Defender's Office New South Wales submitted that:

> *Both the EITE partial exemption and the 'self-generator exemption' should be reviewed, with a view to further limiting or phasing out these exemptions, and increasing their transparency (Australian Network of Environmental Defender's Office NSW, sub.141, p.3).*

A common concern raised in submissions from EITE industries related to the application of the original MRET liability. As currently framed, the partial exemption only applies to an EITE entity's liability above the original MRET – EITE businesses are fully liable for their share of RET costs for the first 9 500 gigawatt hour of renewable energy created under the RET (and have been since the commencement of the MRET in 2001).

EITE businesses, as well as large energy user peak bodies such as the Ai Group, submitted that the partial exemptions for EITE activities should cover the entire RET, including the MRET component of 9 500 gigawatt hours. Such an extension would allow an EITE business to have the partial exemption percentage applied to its entire RET liability, which would reduce RET-related costs for EITE businesses, and transfer those costs onto other electricity users.

The partial exemption was announced in 2009 in the context of the then proposed Carbon Pollution Reduction Scheme, to recognise that EITE industries would be impacted by a carbon price in the context of other cost pressures, such as the global recession (Commonwealth, House of Representatives 2009). Legislators provided EITEs with a partial exemption from the liability associated with the expanded RET, but considered it was reasonable to require all businesses to make some contribution towards renewable energy generation (Commonwealth, House of Representatives 2009).

In principle, the justifications for EITE industries receiving a partial exemption (being higher costs imposed by the carbon price and international competitiveness) apply to the MRET component as they do to the expanded RET. The trade effectiveness of Australia's EITE industries will be influenced by all policies and inputs that increase the costs of EITE production, including the MRET liability. However, extending the EITE exemption to the MRET would increase the burden to other entities. The Authority considers that this issue may warrant specific attention in consideration of the form and level of EITE assistance under the RET.

Both the rationale for the EITE partial exemption and the method of calculating its value is based on the JCP under the carbon pricing mechanism. The JCP is due to be reviewed by the Productivity Commission in 2014-15. Under this review, the Commission will consider the operation of assistance arrangements under the JCP, the impact of the Clean Energy legislation on EITE industries and the economic and environmental efficiency of assistance arrangements under the JCP.

A number of stakeholders emphasised the need for greater alignment between the approaches to EITE assistance under the JCP and the RET. It is the Authority's preliminary view that the existence and level of the RET EITE exemption (including the MRET liability) are best assessed in the context of carbon price assistance, as these measures work together to provide a level of protection against carbon leakage. Given this, and the similarities of the EITE exemption under the RET with the JCP, the Authority's preliminary view is that the Productivity Commission consider the continued existence and level of the RET EITE exemption in its 2014-15 review. A number of more technical amendments to the EITE exemption are discussed below.

DRAFT RECOMMENDATION

R.17. The preliminary view of the Authority is that the level of the emissions-intensive, trade-exposed exemption under the Renewable Energy Target should be considered by the Productivity Commission as part of its broader review of the carbon pricing mechanism Jobs and Competitiveness Program in 2014-15.

Technical amendments to the EITE partial exemption framework

There are a number of technical amendments to the operation of the EITE partial exemption framework that warrant consideration by the Authority, these include flexibility regarding the use of PECs and alignment of reporting requirements under the PEC scheme and the JCP.

Partial Exemption Certificate flexibility

As previously described, the exemptions for EITE businesses are issued in the form of PECs, which may be used to reduce the amount of certificates which a liable entity is required to acquit to meet its annual RET obligations. While PECs are issued to an EITE business, EITE businesses are not usually liable entities under the *Renewable Energy (Electricity) Act 2000*, so the PEC nominates a liable entity (which is usually the EITE business's electricity retailer) against which the exemption can be recognised.

In practice, this means that companies receiving a PEC can only negotiate its value with the retailer that supplies their electricity, creating a risk that an EITE business may receive a lower value for their PEC than the amount of the RET compliance costs that are passed through to them by the retailer. This could undermine the objective of providing the assistance – they are provided for the financial benefit of the recipient, not the electricity supplier.

A number of submitters requested that PECs be made 'tradable' in some way. The Australian Industry Greenhouse Network submitted that:

> *One option to ensure the full opportunity value of PECs is realised is through access to an open market – potentially by formally linking the value of a PEC to the value of a LGC. This will lead to more efficient price discovery, avoid value destruction and allow the intent of the PEC to be met (Australian Industry Greenhouse Network, sub.164, p.6).*

Although many submissions requested that PECs be treated in the same way as certificates, PECs operate differently from certificates. Certificates can be surrendered to meet obligations under the RET, whereas a PEC reduces the overall amount of generation purchased by a retailer that is subject to RET liabilities, rather than directly meeting RET obligations. Consequently PECs and certificates are not directly interchangeable. Furthermore, if PECs could be used to meet liabilities in the same way as certificates, this would reduce the amount of renewable generation that is achieved by the RET, as PECs do not represent renewable generation that has been created.

However, stakeholders' concerns could be met relatively simply by allowing a PEC to be used by any liable entity, rather than just the electricity retailer that supplies the relevant EITE firm. This approach would enable EITE entities to sell PECs to other electricity retailers, potentially allowing them to receive better value. As the PEC would not be solely usable by the EITE firm's electricity retailer, it could also eliminate the need to consider the value of PECs as part of electricity contract negotiations between the EITE entity and its electricity retailer.

Making PECs usable by other liable entities would mean that an EITE entity's electricity retailer would no longer have guaranteed access to a particular PEC and the reduction in obligations that it represents. However, the Authority does not consider that making use of PECs flexible would generally disadvantage electricity retailers as they would then have access to a wider range of sources of PECs, as well as certificates.

An approach of making PECs usable by all liable entities could be largely based on existing systems for compliance, but would entail some small additional administrative costs for the Government associated with changed processes for allocation of PECs and verification of use of PECs by additional liable entities.

The Authority's preliminary assessment is that the benefits outweigh the administrative costs of allowing additional flexibility for EITE entities to recognise the market value of PECs that are allocated to them.

DRAFT RECOMMENDATION

R.18. The preliminary view of the Authority is that Partial Exemption Certificates should be tradeable and made usable by any liable entity to reduce liable electricity acquisitions.

Alignment of Jobs and Competitiveness Program and Partial Exemption Certificate processes

Currently EITE entities are required to submit separate applications to the Regulator to receive PECs under the RET and to receive free carbon units under the JCP. Applications are due by 31 October of the relevant carbon pricing mechanism (financial year) compliance year, and RET applications are due by 30 March of the RET (calendar) compliance year.

The requirements for data used in the JCP and PEC applications are similar. Both PEC and JCP applications require provision of information about the amount of production in the previous financial

year. Although PEC allocations are made on a calendar year basis and free carbon units are allocated on a financial year basis, both processes use production information from the last completed financial year (that is, both PEC allocations for the 2013 calendar year and JCP allocations for the 2012-13 application year rely on production information from the 2011-12 financial year). The PEC application also requires additional information about the amount of liable electricity consumed at the site in the previous year.

Auditing and assurance requirements for PEC and JCP applications are generally the same. However, in some cases where an application is in relation to a new site or a significant expansion to an existing site entities are able to use estimates of future production. In these cases more stringent audit and assurance requirements are applied to the estimates for PEC allocation than those applied to JCP allocations.

A number of submitters requested that EITE processes for the JCP and RET be aligned to reduce compliance costs. For instance, Amcor Packaging Australia Pty Ltd submitted that:

> *All EITE businesses must apply to the Clean Energy Regulator for [PECs] for each EITE activity, based on prior year's actual production. The application for assistance must be audited by a registered auditor as per the REC Regulations.*
>
> *Now that the carbon pricing mechanism has been introduced with a similar [JCP] application procedure, the application process for the 2 forms of assistance should be harmonised and streamlined so only one application and one 3rd party audit of the energy and production data is required (Amcor Packaging Pty Ltd, sub.55, p.5).*

The timing differences between PEC and JCP applications mean that it is unlikely that a single application could be made for both. The key driver of timing differences is the date by which liabilities can be determined for the RET, which cannot be done accurately until after the setting of the RPP and STP. Even if the date for publication of the RPP and STP is brought forward to November, as proposed by the Authority (section 6.1.4), this will not be sufficiently early to allow for a single application. It is unlikely that liable entities would wish to take the alternative approach of delaying decisions on JCP free carbon unit allocations to allow a single application to be made.

However, as much of the information used is the same between the applications it should be possible to streamline the two application processes to minimise duplication of work and allow sharing of information between applications. A potential limitation that may need to be addressed is that the eligible applicants for the RET and JCP will often be different entities, which may create legal impediments to sharing information between applications. In addition the concept of a 'site' at which electricity is consumed that is used as a basis of RET allocation is not exactly the same as a 'facility' that is used for allocation under the JCP, and there may be benefits to matching these two definitions to align the scope of information to be given in applications.

Opportunities also exist to streamline audit and assurance processes between the JCP and PEC applications. In particular, the audit and assurance requirements under the RET and the JCP for estimates of future production could be matched, as there do not appear to be any reasons for more onerous requirements to be applied under the RET. Consistent with the improvements recommended above for application processes, there may also be opportunities to seek permission for the sharing of data between the audit processes where different legal entities are involved in providing the data, and to removing differences between the definition of site and facility to align the scope of audit and assurance requirements.

The Authority understands that the Clean Energy Regulator is already examining a number of the opportunities under the current legislation for the proposed alignment identified above, and encourages the Government to implement any practicable options.

DRAFT RECOMMENDATION

R.19. The preliminary view of the Authority is that the Commonwealth Government should consider opportunities to align application processes and data requirements for the Jobs and Competitiveness Program and Renewable Energy Target as closely as possible.

6.4.2. Self-generator exemptions

The second form of exemption under the RET applies to entities that generate their own electricity. To be exempt, a self-generator (on a grid of greater than 100 MW capacity) must:

- produce and use the electricity for themselves with no take-off from a third party; or
- in cases where the self-generator is the primary, but not the only, user, the electricity must be used within a 1km radius of its production by the entity that generated it.

The self-generator exemption has been included in the MRET since its commencement in 2000. It was retained with the expansion of the RET and the inclusion of the EITE exemption in 2009.

Limited information is available on the amount of self-generation that occurs in Australia, as parties that fall under the self-generator exemption are not required to report generation to an electricity market regulator or the Clean Energy Regulator. However, based on available data the magnitude of all sent-out off-grid generation in Australia is estimated to have been not more than three per cent of total electricity generation in 2009-10. Furthermore, some of this generation would have come from generation facilities or transmission networks under the 100 MW capacity, so the amount of generation subject to the self-generation exemption would be smaller again.

The historical rationale for the self-generator exemption is not set out clearly in public documentation. In the regulatory impact statement attached to the MRET explanatory memorandum, the Australian Greenhouse Office stated that there were strong arguments for both the inclusion and exclusion of self-generators, but concluded by supporting the inclusion of self-generators (that is, that they should not be exempt) (Australian Parliament, 2000). The Australian Greenhouse Office noted that it could be argued that the MRET would operate more effectively and achieve greater emissions reductions if self-generators were included, but conversely, exclusion of self-generators could be considered as supporting the development of self-generation, of which a substantial proportion used more efficient cogeneration technologies and less greenhouse intense fuels.

Ultimately, however, provision for self-generators was included in the MRET Bill. The explanatory memorandum simply states that self-generators are exempt due to the 'Government's agreement to not cover self-generators under the scheme'. No further explanation is provided (Commonwealth Parliament, 2000).

When the RET was expanded in 2009, the issue of the self-generation exemption was referred to the COAG Review of Specific RET Issues. The terms of reference for the COAG review included the consideration of the self-generation provisions in light of:

> *… recent developments in resource project development structures [and] the potential for the self-generation provisions to create perverse incentives for companies to structure their*

operations to avoid RET liability, or otherwise distort resource development decisions (Renewable Energy Sub Group, 2012, p.41).

In other words, while the COAG review considered whether the self-generation exemption should be retained or expanded, it did not consider whether it should be repealed in the context of the introduction of the EITE exemption. The Renewable Energy Sub Group's report to the COAG review concluded – with a dissenting view from the Western Australian Government – to leave the self-generation provision unchanged. The primary rationale for not extending the self-generation exemption was that a broad liability base should be maintained, with the Report noting (p. 3): 'the RET is a national scheme that requires national participation, and … extending the exemptions would impose additional costs on non-exempt liable parties'.

The self-generation exemptions increase costs for other liable parties to the RET. In quantitative terms, the effect is estimated to be small, since the exemption applies to a small proportion of overall electricity production.

Most submissions to this Review regarding the self-generator exemption are from entities that are eligible for the exemption and argue it should be continued and expanded. The main arguments put forward for maintaining and expanding the self-generation exemption are:

- avoiding the loss of projects overseas due to cost pressures;
- a lack of choice in electricity supply faced by isolated projects; and
- to encourage self-generation, on the basis that self-generation is generally less emissions-intensive than the average of grid-based electricity supply.

In relation to the argument that investment in large resource projects would be scaled back or lost to overseas competitors, in its submission, the Western Australian Chamber of Minerals and Energy stated:

The RET self-generator exemption was implemented to account for the different circumstances facing renewable power development for remote generators. Remote generators are unable to access the grid to manage supply when renewables may be offline and would be required to buy [RECs] on the market. This would render many self-generation projects unviable if the exemption was removed (WA Chamber of Minerals and Energy, sub.106, p.2).

The Australian Aluminium Council further noted that:

There are multiple reasons for the Government to encourage self-generation of electricity in including the development of remote resource projects, efficient distribution of electricity and lower emissions intensity (Australian Aluminium Council, sub.73, p.6).

Competition from international businesses which do not face a RET liability will be a concern for a business if: electricity accounts for a significant proportion of overall costs; and the business is trade-exposed and therefore cannot pass on the additional cost of the RET. The EITE partial exemption arrangements are designed to address these issues.

A number of stakeholders noted that much of the non-grid connected generation that is covered by the self-generation exemption is likely to take place as part of remote resource extraction activities that are not eligible to receive an EITE exemption, for example, Chevron Australia stated:

Very few EITE activities are likely to be operating in remote areas and subject to the self-generation exemption (Chevron Australia, sub.74, p.2).

A number of other submitters stated that self-generators and EITE are separate activities and submitted that the two should be considered separately. For instance, the Australian Industry Greenhouse Network stated that:

The discussion paper makes some connection between the self-generator exemption and the EITE partial exemptions. AIGN notes that the EITE partial exemption reduces some of the RET costs at a time of rising electricity costs and additional carbon liabilities and recognises the difficulties in passing on these costs. In contrast, the self-generation exemption relates to the specific nature of these activities:

- *remote resource projects where a project often has little choice but to generate its own electricity; or*
- *cogeneration where the site has specific requirements for both electricity and steam to meet process requirements or options exist to use waste energy for power production.*

The self-generation and PEC policies were designed for different purposes (Australian Industry Greenhouse Network, sub.164, p.9).

However, concerns about trade exposure are equally valid whether a project generates its own electricity or not. It is not clear that, since the introduction of the EITE exemption, there need also be a self-generator exemption on this basis. It may be that the EITE exemption is not sufficient – if this is the case, it should be addressed in the Productivity Commission's review of EITE assistance.

The second justification for the self-generation exemption relates to the lack of choice faced by isolated projects in relation to their power source. A number of submissions point out that it is not viable for many self-generators to access renewable generation opportunities. However, the choice faced by liable entities – even those connected to a large grid – is more apparent than real. For example, under the National Electricity Market, generators sell into, and retailers purchase electricity from, a 'pool' (supplied by generators determined by the market operator), not a particular generator. For these reasons, the RET scheme was deliberately designed to separate the certificate market from the electricity market – an electricity retailer's liability is not affected by the generation source of their electricity. There is no need for liable parties to have any particular connection with the renewable generators from which they purchase certificates.

The third justification for the self-generation provisions is to encourage self-generation, on the basis that it tends to be less emissions intensive (on average) than grid-based electricity. For example, the Australian Petroleum Production and Exploration Association Ltd (APPEA) submitted that:

[It] supports the policy intent of the existing provisions. The natural gas industry, including the LNG industry, uses natural gas for self-generation purposes (or proposes to) at many facilities around Australia.

Natural gas produces significantly fewer greenhouse gas emissions than coal when used in power generation and is generally significantly lower than the average emissions intensity of grid-based power supply. The self-generation provisions, as they apply to the natural gas industry, are important in supporting lower emissions power generation options (Australian Petroleum Production and Exploration Association Ltd, sub.108, p.9).

A number of other submissions also claimed that self-generation has low emissions-intensity. It is difficult to definitively assess the accuracy of this assertion based on the limited information on large-scale self-generation available. However, on the basis that much self-generation is likely to take place as part of remote resource extraction projects and be based on relatively low emissions-intensive natural gas generation, it is likely to be correct.

Even assuming that self-generation does tend to have lower average emissions, it is important to note that the self-generation exemption contains no requirement for low emissions intensity – indeed, some highly emissions-intensive coal-fired electricity generation attracts the exemption. More fundamentally, the carbon price will encourage less emissions-intensive self-generation where it is cost-effective to do so. There should be no need for a separate exemption under the RET.

The Authority's preliminary view is that there is no convincing rationale to exempt self-generators from the RET. It is possible that the exemption itself may create undesirable distortions, by encouraging self-generation when it would otherwise have been uneconomic to do so, or by creating competitive distortions between firms in the same industry.

However, the self-generator exemption has been in place since the beginning of the MRET in 2000. It may be that some investments have relied on the existence of the exemption. Removing the exemption may adversely affect these projects. Rather than risk undermining the economic viability of projects made under the existing law, the Authority considers that projects that already gain the benefit of the exemption should continue to do so, but that new projects should not be exempt. Transitional provisions for projects that are committed but not yet commissioned are likely to be required.

DRAFT RECOMMENDATION

R.20. The preliminary view of the Authority is that there is no strong case for the exemption from liability under the Renewable Energy Target for self-generation, and that the exemption should be removed for new self-generation (but retained for existing self-generators).

REFERENCES

Commonwealth Government, *Enhancing the Renewable Energy Target Discussion Paper*, March 2010.

Commonwealth, House of Representatives 2009, *Parliamentary Debates*, 17 June.

Renewable Energy Sub Group, *Report to the Council of Australian Governments' Select Council on Climate Change, COAG Review of Specific RET Issues*, March 2012.

Commonwealth 2000, Explanatory Memorandum, *Renewable Energy (Electricity) Bill Renewable Energy (Electricity) (Charge) Bill*.

CHAPTER 7. ELIGIBILITY OF RENEWABLE ENERGY UNDER THE RENEWABLE ENERGY TARGET

This chapter considers the eligibility of sources and technologies under the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES), with specific regard to the eligibility of waste coal mine gas and biomass from native forests under the LRET, and whether additional technologies including displacement technologies should be eligible under the SRES.

Certain eligibility, registration and accreditation requirements must be met before certificates can be created under the Renewable Energy Target (RET) scheme. For the LRET, the energy source must be listed as "eligible" under the *Renewable Energy (Electricity) Act 2000* (Cth) *(REE Act)*, the owner (or owner's agent) must be registered with the Clean Energy Regulator, and the power station must be accredited. For the SRES, eligible technologies are set out in the *REE Act* and must meet certain standards.

This chapter discusses the following issues:

- eligibility framework and accreditation process under the LRET (Section 7.1);
- eligibility of waste coal mine gas (Section 7.1.3);
- eligibility of wood waste from native forests (Section 7.1.5);
- eligibility framework under the SRES (Section 7.2);
- consideration of additional small-scale technologies under the SRES (Section 7.2.1); and
- consideration of additional displacement technologies under the SRES (Section 7.2.2).

The accreditation process under the SRES is discussed in Chapter 9.

7.1. Eligibility framework and accreditation of power stations under the LRET

The LRET takes a 'list' approach to eligible sources. There are currently 19 eligible renewable energy sources listed in the *REE Act* including hydro, wind, solar, geothermal, biofuel and biofuel sources and other sources with emerging technologies based on ocean currents and municipal waste solids and gases. Additional renewable sources may be added by regulations.

The *REE Act* specifically states that fossil fuels and materials or fossil fuel waste products derived from fossil fuels are not "eligible renewable energy sources". This effectively means that these sources cannot be added through regulations, to do so would require an amendment to the *REE Act*. Although the RET is designed to promote renewable energy, there is one waste product derived from fossil fuels, waste coal mine gas, that is included as an eligible source until the end of 2020.

The issues paper asked whether the list approach of eligible sources is the most appropriate way of determining eligibility under the LRET. A number of submissions support the list approach as an

appropriate method of providing the basis for accrediting power stations. The preliminary view of the Authority is that the list of eligible sources is extensive and allows for a variety of technologies to be deployed.

The geothermal industry has commented that the definitions for two currently eligible sources, geothermal-aquifer and hot dry rocks, are out of date and should be changed to hot sedimentary aquifer and hot rock respectively. In its submission, the Australian Geothermal Energy Association stated that it is more appropriate to refer to hot rocks, as Australian projects will most likely be developed in areas with naturally occurring water tables intersecting geothermal wells.

The Authority's preliminary view is to leave the definitions unchanged at this time, noting that there are two considerations with regards to whether a current definition should be changed to accurately reflect the resource which is used:

- whether the Clean Energy Regulator can accredit power stations based on current definitions with the view that they are broadly similar, as this would not require any legislative change; or
- whether an amendment to the *REE Act* may be required, or if new definitions can be added through regulations, which may be a simpler way of updating the definition.

The Authority is continuing to consider this matter.

7.1.1. Registration and accreditation process

The accreditation process establishes that a given power station is eligible to create Large-scale Generation Certificates. The accreditation process is outlined in Box 12. In assessing the accreditation process the Authority has considered whether the process is robust and effective, accessible, and timely.

Requiring one point of contact ensures efficient communication throughout the application process and minimises processing time. Pre-approval arrangements provide flexibility for power stations that are in the stages of development or are seeking financial support on the basis that they will be approved.

The timeframes for approving applications are set out in legislation, which provides a level of certainty for applicants. The Clean Energy Regulator advised that decisions on some power stations can take longer than six weeks, however any delays on these decisions would usually be due to verifying supporting documentation.

One objective of the *REE Act* is that renewable energy generated is ecologically sustainable. The requirement for applications to provide evidence that their power station conforms to planning and environmental laws ensures that renewable power stations that are accredited meet this objective.

Registration and accreditation fees are clearly set out in regulations, and are listed according to the size of the power station and related accreditation requirements. This approach is equitable for applicants, ensuring that they only pay for the cost associated with their circumstances.

The determination of boundaries around components included in a power station appears to be appropriate. The Clean Energy Regulator advised that it had not had any significant issues accrediting eligible power stations to date, and no submissions commented on the registration and accreditation process.

Box 12 Establishing a power station under the LRET

The Clean Energy Regulator is responsible for accrediting power stations under the LRET, and provides a step by step process on its website for applicants.

The Clean Energy Regulator requires one point of contact to liaise with throughout the accreditation process, and applicants must register a nominated person prior to applying for accreditation. Applicants can register online, and a nominal registration fee of $20 applies.

A registered person may apply for a power station to be accredited based on renewable sources listed in the *REE Act*. Applicants can apply for accreditation by downloading relevant forms from the Clean Energy Regulator's website. An application fee applies, and varies depending on the size of the power station and complexity of the accreditation process.

The applicant is required to specify the components of the electricity generation system that make up the power station. The Clean Energy Regulator applies boundaries around the power station and determines which components are included in the power station, using guidelines outlined in regulations.

The regulator is required to make a decision on an application within six weeks of it being properly made. Once accredited, LRET power stations may create Large-scale Generation Certificates. Provisional accreditation is also available for projects in development to assist developers secure appropriate financing.

The accreditation process also establishes a power station's baseline. The *REE Act* was designed to encourage additional renewable energy generation. Therefore, Large-scale Generation Certificates are only issued for renewable generation above the existing generation at the time the Mandatory Renewable Energy Target (MRET) was established. The baseline is generally the average amount of electricity generated over the 1994, 1995 and 1996 calendar years. For power stations established after 1 January 1997 the baseline is zero.

As part of the accreditation process, applicants must provide evidence that their proposed power station conforms to State and Federal regulations including environmental laws. For example, applicants applying for accreditation for power stations using wood waste must meet additional eligibility requirements and are provided additional assessment criteria for this resource.

The Authority's preliminary view is that the LRET eligibility and accreditation arrangements are appropriate, and they ensure power stations are installed in accordance with relevant regulations and are registered to create Large-scale Generation Certificates.

DRAFT RECOMMENDATION

R.21. The preliminary view of the Authority is that no change is necessary to the accreditation process for LRET.

7.1.2. Adding additional non-renewable or non-generation technologies to the RET

A key issue for the Review is whether there are additional sources that should be made eligible. As discussed below, numerous submissions requested that eligibility be extended to either:

- non-renewable (but low emissions) generation sources, such as new waste coal mine gas projects or cogeneration projects using waste industrial heat, originally created from non-renewable sources; or
- additional 'displacement' technologies, which generate no electricity themselves, but displace the use of electricity.

In both cases, proponents argue that from an environmental effectiveness point of view, using such technologies will reduce greenhouse gas emissions from the electricity sector, in accordance with one of the objectives of the *REE Act*. Purely from an environmental effectiveness point of view, it is difficult to argue that eligibility should not be extended to these other activities.

These arguments highlight the differences between the use of a sector-based policy, such as the RET, compared with a broad-based measure like the carbon price. A chief advantage of the carbon price is that it automatically creates an incentive for all low-emissions or displacement technologies. Under the RET, however, boundaries are drawn. If they are not drawn, then the RET increasingly resembles a second broad-based carbon price – and it is difficult to see why such a mechanism could ever be justified alongside the actual carbon price.

Boundaries around eligibility under the RET are drawn to further the other key objective of the *REE Act* – to promote additional renewable generation. As discussed in Chapter 3, this is essentially an industry development objective, designed to promote the growth of an industry that is predicted to play a significant role in Australia's electricity supply in a carbon constrained future, and whose growth may currently be curtailed by uncertainty regarding the future of a carbon price and the credibility of governments' commitments to making long-term, deep cuts to greenhouse gas emissions.

The issue of boundaries around renewable generation eligibility is complicated by the fact that there are already exceptions to the rule – solar hot water systems (which have been included from the start of the scheme) and certain waste coal mine gas generation projects. These existing exceptions make it more difficult to argue that no further exceptions should be made, and encourage continual lobbying to this effect.

The Authority has taken the view that the RET is not a second broad-based carbon price, and eligibility should not be expanded to cover other non-generation or non-renewable technologies. The Authority's deliberations on specific matters including waste coal mine gas, wood waste from native forests and eligibility of technologies under the SRES is considered in subsequent sections.

7.1.3. Waste coal mine gas under the LRET

A key issue that has been raised during the Review is the eligibility of waste coal mine gas in the LRET. Waste coal mine gas is a by-product of coal mining and as such is clearly not a renewable energy source. Nonetheless waste coal mine gas was added to the RET in 2009 as a transitional measure following the cessation of the New South Wales Greenhouse Gas Reduction Scheme on commencement of the carbon price. In reviewing the eligibility of waste coal mine gas in the RET the Authority has considered:

- whether to maintain eligibility for those nine waste coal mine gas power stations that are currently eligible; and
- whether additional waste coal mine gas power stations should also be made eligible.

Eligibility for waste coal mine gas began on 1 July 2012 and is limited to seven existing waste coal mine gas power stations that were operating in 2009 and receiving support under New South Wales Greenhouse Gas Reduction Scheme, with separate annual targets of 425 gigawatt hours (GWh) from 1 July 2012 to 30 June 2013, and 850 GWh each year from 1 July 2013 to 2020.

These targets are in addition to the LRET target of 41 000 GWh. This is to ensure that waste coal mine gas does not displace renewable generation under the scheme. As a benefit to renewable generation, any unutilised waste coal mine gas allowance is added to the LRET target each year. Waste coal mine gas cannot receive certificates for any generation above its total allowance. This means that the inclusion of these waste coal mine gas power stations has increased the cost of the RET.

In its submission, Envirogen argued that while waste coal mine gas is not a renewable energy source, it should be eligible:

> *As [waste coal mine gas] generation can be classified as a zero additional emissions source of generation achieving the same reductions in greenhouse gas emission as other renewable generators, the outcome of [waste coal mine gas] generation is similar to that of other generation which is assisted by the RET. (Envirogen, sub.44, p.6)*

Energy Developments Limited supported continuing to allow existing waste coal mine gas in the scheme, noting that waste coal mine gas is zero-rated and achieves one of the objectives of the *REE Act.* Conversely, a number of submissions (including IPART, WWF Australia, and the Tasmanian Government) called for the removal of waste coal mine gas as an eligible source, primarily because it is not renewable. For example, the Conservation Council of South Australia Inc submitted that:

> *Only renewable energy should be eligible to create LRET certificates [and] the cost effectiveness of [waste coal mine gas] capture and use should be considered under fossil fuel policies not RET. (Conservation Council of South Australia Inc, sub.72, p.3)*

In principle, the Authority is of the view that waste coal mine gas should not be an eligible source under the RET because it is not a renewable source, and that the use of waste coal mine gas for power generation should be sufficiently encouraged by the carbon price.

However eligible waste coal mine gas power plants under the RET were included because it was assessed that the financial returns to these projects would have been reduced by the introduction to of the carbon price compared to the returns had the New South Wales Greenhouse Gas Reduction Scheme continued. The additional revenue from the RET was therefore intended to ensure these projects were not adversely impacted by the change in policy framework. The removal of these projects from the RET would mean that the Government would need to consider alternative transitional arrangements for these projects not to be made worse off. It is not clear that any alternative arrangements would cost less than maintaining the existing arrangements under the RET.

Removing waste coal mine gas power stations that are currently eligible from the RET would be another significant change in the policy framework for these projects. Investments in these projects were initially made on the basis that they would have been supported under the New South Wales Greenhouse Gas Reduction Scheme and since 2009 continued to operate under the assumption that

they would be supported by the RET if and when the New South Wales Greenhouse Gas Reduction Scheme ceased. It is therefore important to provide some policy stability and predictability.

There are clear boundaries to support for waste coal mine gas under the LRET, where only existing waste coal mine gas power stations are eligible and only until 2020, with separate targets to the broader RET target. Given this contained support for waste coal mine gas, the Authority's preliminary view is that the existing arrangements under the LRET should not be changed.

7.1.4. Inclusion of new waste coal mine gas

Some waste coal mine gas generators have proposed allowing new waste coal mine gas projects into the RET. For example, Envirogen supported the inclusion of new waste coal mine gas in addition to the 850 GWh allowance for existing waste coal mine gas on the basis that it 'will make a further contribution to emission reductions' and to ensure continued investment in the resource (Envirogen, sub.44, p.7).

On the other hand, while Energy Developments Limited supported the continued inclusion of existing waste coal mine gas, it did not consider new waste coal mine gas projects should be eligible:

> *… whilst support is warranted to promote the significant greenhouse gas abatement potential of new [waste coal mine gas] clean energy projects, the RET is currently not the appropriate mechanism for these new projects … (Energy Developments Limited, sub.75, p.3)*

In its *Review of Specific RET Issues*, the Renewable Energy Sub Group recommended against including new waste coal mine gas on the grounds that it would increase the cost of the RET scheme and involve a fundamental policy change in the RET (Renewable Energy Sub Group 2012, p.67).

Including new waste coal mine gas within the overall target could potentially reduce the overall cost of the scheme if waste coal mine gas displaced more expensive renewable energy. However, since waste coal mine gas is not renewable, inclusion of further waste coal mine gas in the RET would reduce the effectiveness of the scheme in relation to its objective of promoting additional *renewable* energy.

Further, if new waste coal mine gas were to be added to the RET, there is the possibility that eligibility could be extended to other non-renewable waste gases. Bluescope Steel stated that if waste coal mine gas continued to be eligible, it would be logical to extend eligibility to other industrial gases that can be burned to generate electricity.

In some submissions it has been proposed that other industrial waste energy sources could be included on the basis that they reduce emissions and reduce demand for grid electricity (Ai Group, sub.46, p.14). For example, waste heat has been proposed as it can be used as either a displacement heat source or to generate electricity via steam turbines. However, allowing additional non-renewable waste energy sources would undermine the objective of the RET. In addition, industrial gases are largely covered by the carbon pricing mechanism, which in itself provides a strong incentive for businesses to find the most cost effective way of minimising emissions from these gases.

If the target is increased to account for new waste coal mine gas, there would be no impact on the amount of renewable generation. If inclusion in the RET drives investment in electricity generation from waste coal mine gas in the future, there would be greater emissions reductions attributable to the electricity sector, thereby reducing the number of international carbon permits that would need to be purchased under the carbon pricing mechanism. Increasing the RET to account for new electricity generation from waste coal mine gas would, however, increase the cost of the scheme and, consequently, the cost to consumers.

While it is not anticipated that there will be significant expansion of waste coal mine gas generation between now and 2020, inclusion of any additional generation in the RET ultimately increases the costs of the RET that are passed on to consumers. Given that the rationale for including existing waste coal mine gas use was that it is a transitional measure, and that the carbon price is now in operation, there is no clear case for new waste coal mine gas to be included.

DRAFT RECOMMENDATION

R.22. The preliminary view of the Authority is that existing arrangements for waste coal mine gas should be maintained.

R.23. The preliminary view of the Authority is that there should be no change to the *REE Act* to allow for new waste coal mine gas to be eligible.

7.1.5. Wood waste from native forests under the LRET

Wood waste from native forests is not included in the LRET. It was originally included in the MRET, and was removed from the RET in 2011 following agreement of the Multi-Party Climate Change Committee as part of the Clean Energy Future plan.

The inclusion (or exclusion) of biomass from native forests has been a controversial issue for some time. The 2003 MRET review referred to submissions in support of and against its inclusion in the MRET, and recommended two options – removing wood waste from native forests from the RET, or leaving it in but separating it from other eligible wood waste sources. In support of removing the energy source, the 2003 MRET review noted that the objectives of the *REE Act* would be more easily achieved by removing such a contentious element. In support for leaving wood waste from native forests in the RET, the 2003 MRET review noted that at the time there was no compelling evidence that it would alter forest management practices or accelerate the growth of logging.

During the design of the enhanced RET in 2009, there was a number of submissions calling for the removal of wood waste from native forests. During the House of Representatives debate on the Clean Energy Future legislation an unsuccessful motion was put forward by Rob Oakeshott MP to block the removal of wood waste from old growth forests from the RET (Commonwealth, House of Representatives, 2012).

As part of it being removed under the current scheme, regulations were added to provide for transitional arrangements to preserve existing eligibility provisions for power stations already accredited by the Clean Energy Regulator to use wood waste derived from native forest biomass subject to specified conditions (*REE Amendment Regulations 2011 no.5*).

The Authority has received submissions calling for wood waste from native forests to be eligible under the RET. The eligibility of wood waste from native forests was not discussed in the RET review issues paper, and the Authority notes that other participants at present have not commented on the eligibility of wood waste from native forests.

The main arguments against the eligibility of biomass from native forests in the RET is that it would create an added incentive to log native forests, especially if the value of electricity generation becomes higher than other uses of native forest timber and wood waste. Arguments supporting its eligibility are that the use of native forest biomass as a zero-rated energy source replaces fossil fuel generation, and that wood waste from forests is generally burned anyway.

In practice, despite its eligibility since the beginning of the MRET, very few certificates were ever created from native forest biomass, and there was a clear market preference against these certificates, which traded at a substantial discount to other Renewable Energy Certificates.

Under the original MRET, criteria were applied to wood waste from native forests requiring it to comply with local Government planning and approval processes, to be harvested under a Regional Forestry Agreement, and that the waste is genuine (i.e. the native forest was logged for a higher value use and that the biomass used was a by-product of that logging) (*REE Regulations 2001*). Further to this, logging of native forests is managed under State Government forestry plans which place limits on the amount of logging activity allowed. This effectively caps the amount of wood waste that can be used for generation.

While measures under the MRET and State forestry plans effectively limited the amount of available wood waste from native forests, there still remains the possibility that the burning of wood waste for electricity generation could be profitable enough to incentivise demand for further logging in the future. However in its submission, the Australian Forest Products Association commented that the value of electricity generation from native forests is less than for other uses:

> *Waste is defined as a by-product of normal forestry operations, which are primarily for integrated sawlog and pulpwood production and incentives for energy generation will not replace these higher value market drivers. (Australian Forest Products Association, sub.14, p.6)*

The objective of the RET is to encourage additional renewable generation that is ecologically sustainable. It is not clear that allowing wood waste from native forests would encourage further logging of these forests for electricity generation. However a high level of forestry and environmental regulations has been necessary to ensure wood waste from native forests is harvested in an ecologically sustainable manner.

Adding wood waste from native forests back into the RET would benefit a few small potential generators, but at high administrative cost and continued public concern about the inclusion of the resource. Reintroducing the resource again would need to be considered in this context, and whether the costs associated with regulating the resource are weighed up with the benefits of reducing greenhouse gas emissions by encouraging the burning of wood waste from native forests for electricity generation through the RET.

The Authority's preliminary view is that no change should be made to allow wood waste from native forests to again be included in the RET. This is because a robust process would need to be re-introduced to ensure it was an ecologically sustainable source of renewable energy. Concerns have previously been raised that the process employed under the MRET did not adequately ensure ecological sustainability of the wood waste. It is not clear that the benefits of including wood waste from native forests would outweigh the costs of developing arrangements to adequately address these concerns.

DRAFT RECOMMENDATION

R.24. The preliminary view of the Authority is that without a clear process for ensuring that inclusion of wood waste from native forests would be ecologically sustainable that it should not be reintroduced to the RET.

7.2. Eligible technologies under the SRES

The *REE Act* provides that 'solar water heaters' and 'small generation units' may generate Small-scale Technology Certificates. There are three types of small generation units – solar PV with a capacity limit of 100 kilowatt (kW), micro hydroelectric systems up to 6.4 kW, and small wind turbine systems up to 10 kW.

Solar water heaters are eligible if they meet relevant Australian and New Zealand standards. These standards cover both solar water heaters and air source heat pumps. To be eligible, a heat pump cannot have a volumetric capacity of more than 425 litres.

The two key issues to be considered in the Review relating to the eligibility of small scale technologies relate to:

- the addition of new small-scale renewable generation technologies; and
- the inclusion of (existing and new) displacement technologies.

This section will discuss the addition of any new technologies into the scheme generally, with a view on displacement technologies both currently eligible and the proposition of adding new displacement technologies.

7.2.1. Additional small-scale technologies

As the RET scheme has progressed, new small-scale technologies have been added to the scheme, and more recently new technologies have been proposed for inclusion.

The Regulatory Impact Statement attached to the Explanatory Memorandum of the Bill to split the RET identifies the RET Review as a possible mechanism for recommending the addition of new technologies. As part of recommendations from the Regulatory Impact Statement, the Review would also consider a framework for determining eligibility under the RET, particularly for small-scale technologies.

The Authority has considered in the Review if, in principle, new small scale technologies should be considered for inclusion in the RET and, if so, what framework should be used to assess potential technologies. It has then considered if there are currently any new technologies that could be considered for inclusion.

The scheme was originally intended to be technology-neutral as a way of ensuring the target was met at the lowest possible cost, and that the mix of technologies used to generate energy from renewable sources could evolve over time.

The uncapped nature of the SRES means that cost minimisation is no longer automatic: additions of new technologies could potentially add to the cost of the scheme as new technologies would not necessarily displace existing small scale technologies, but may be deployed in addition to them. This will always mean that a judgement would need to be made when adding new technologies to the scheme.

The addition of new technologies was considered in the Renewable Energy Sub Group's *Review of Specific RET Issues* to the Council of Australian Governments. The review recommended that no new small-scale technologies should be eligible, on the basis that the SRES is uncapped, so any additional small-scale technologies would add to costs for electricity consumers. (The extent of uptake of these new technologies was highly uncertain, and hence so was the potential impact on consumer prices.)

It is also important to consider any implications eligibility arrangements might have on competition. For example, if a new small-scale technology was developed that would directly compete with those small scale technologies that are eligible; it would be at a competitive disadvantage if it was not also made eligible.

The preliminary view of the Authority is that, in principle, new small-scale technologies should be considered by the Minister on a case by case basis for inclusion in the SRES, and that the decision be based on the following considerations:

- is the proposed technology currently not eligible (i.e. is it truly a new type of technology);
- does the proposed technology generate renewable energy;
- is the proposed technology a small-scale technology; and
- is the proposed technology commercially ready.

In addition a judgement would need to be made taking into account the likely cost implications of making the technology eligible and any competitive distortions of not making the technology eligible. A clear process taking into account the above considerations would effectively assist proponents of new small-scale renewable energy technologies for proposing their technology for eligibility under the SRES.

It may already be possible to add new technologies, as there is a general provision under the *RRE Act* for the Minister to include by regulations "emerging renewable energy technologies" in the RET scheme. This provision was agreed to during the Senate debate on the REE Amendment Bill 2010 (the Bill) on 23 June 2010. However it is not clear that this provision applies specifically to small-scale technologies under the SRES or whether it is sufficient to allow for the addition of small-scale renewable and displacement technologies under the SRES. Consideration should be given to whether a new regulation making power should be included in the *REE Act* to explicitly allow for the addition of new small scale technologies.

An alternative approach would be to include any new small scale technologies into the LRET, providing they meet the minimum 10 kW capacity requirement under the LRET. The Authority is considering this approach, noting that this option would not add to the overall costs for consumers. In addition it would also be easier to add technologies by regulations, not requiring any changes to the *REE Act*. However consideration needs to be made on whether there is any competitive advantage for small-scale technologies under the LRET compared to those under the SRES, and whether the minimum capacity requirement under the LRET would need to be changed to allow for new small-scale technologies.

In principle new technologies should be considered, however no new technologies that would satisfy the above criteria have been proposed to the Authority. Furthermore, the Renewable Energy Sub Group also noted that no small-scale generation technologies outside those listed in the *REE Act* were at a level of market-readiness to make them deployable under the RET (Renewable Energy Sub Group 2012, p.2). The only new technologies that have been proposed to the Authority are considered displacement technologies and are discussed in the following section.

DRAFT RECOMMENDATION:

R.25. The preliminary view of the Authority is that new small scale technologies should be considered on a case by case basis for inclusion in the SRES.

R.26. The Authority notes that at this time there are no additional new small scale technologies that should be made eligible in the SRES.

7.2.2. Displacement technologies

Displacement technologies provide energy without electricity generation. For example, a solar water heater uses the sun to directly heat water, without the need for a solar photovoltaic electricity generation system to convert the suns energy into electricity that would create heat through electrical resistance.

Two of the five technologies eligible to create small scale certificates under the SRES are displacement technologies – solar water heaters and heat pumps. Both technologies have been eligible under the RET since the MRET was established, on the basis that they are alternative forms of energy generation that displace electricity consumed from the grid. Solar water heaters were historically the most popular small-scale technology under the RET; however, they were overtaken by solar PV units in 2010 (see Chapter 5).

Since the establishment of the SRES displacement technologies have made up a small amount of deemed certificates that have been created, where heat pumps account for 0.9 per cent of Small-scale Technology Certificates generated and solar water heaters account for 4.4 per cent.

In addition, a small number of submissions have proposed that new displacement technologies – notably ground sourced heat pumps – become eligible under the SRES.

Conversely, a number of submissions from energy companies and associations, competing technology companies, and other participants have called for removing displacement technologies from the RET. The main arguments against the inclusion of displacement technologies in the RET are that they are not electricity generation technologies, that they increase the cost of the scheme for consumers, and that they should be supported through other incentives outside of the RET. An individual participant submitted that the inclusion of displacement technologies does not reflect the policy intent of the RET:

> *As the RET was developed as a means to achieve the Commonwealth commitment to "at least 20 [per cent] of Australia's electricity from renewable sources by 2020", displacement technologies would not be included in this definition. (Hallenstein, et al, sub.19, p.20)*

Arguments for including displacement technologies are that they provide similar benefits to small-scale electricity generation technologies, and that they compete directly with small-scale generation technologies. Should Governments support one over the other by not including displacement technologies in the RET, then there would be far less incentive to install a legitimate alternative.

One objective of the RET is to encourage additional renewable generation. Including displacement technologies in the SRES raises a question about whether the objective is to add electricity generation only or also to displace electricity use. If the SRES remains uncapped, additional technologies including displacement technologies could increase the cost of the RET. Moreover, the policy objective of the RET to drive renewable electricity generation is diluted by adding additional displacement technologies.

Furthermore, there may be overlaps with energy efficiency schemes. The states and territories have several energy efficiency certificate schemes (known as 'white certificate schemes') in place that cover solar water heaters and heat pumps. These schemes are certificate trading schemes similar in form to the RET, except that each certificate relates to an amount of energy saved, rather than renewable energy produced. The Commonwealth Government is also considering whether it should seek to implement a national energy efficiency white certificate scheme (a National Energy Savings Initiative), which would subsume existing state-based schemes. The RET scheme is generally focused on the supply of renewable electricity to the market, and as displacement technologies are a demand side approach to managing electricity consumption, Government measures such as an 'Energy Savings Initiative' would be a more obvious home for displacement technologies (new and existing) than the RET.

In its *Review of Specific RET Issues*, the Renewable Energy Sub Group dismissed the addition of two new technologies – geo-thermal ground-source heat pumps and solar-assisted cooling systems – on the grounds they were displacement technologies. The Renewable Energy Sub Group recommended that:

> *[these] technologies…would be better suited for support under an energy efficiency scheme rather than a scheme that is primarily designed to support renewable electricity generation (Renewable Energy Sub Group 2012, p.35).*

The Authority is aware that a national white certificate scheme has not been confirmed, and that without such a scheme for existing displacement technologies to transition into, these technologies may be worse off by removing them from the SRES.

Taking into account submissions that have called for the removal of displacement technologies on the basis that they should be supported by other incentives, the Authority's preliminary view is that existing displacement technologies should remain in the SRES, and should be phased out if and when a national energy efficiency scheme that would cover them is established. Similarly, if the broader regulatory framework that applies to these technologies at the state and territory level changes in the future so that any of these technologies no longer needs the RET to encourage uptake then the technology should be phased out of the RET.

The Authority's preliminary view is that additional displacement technologies should not be added to the SRES. While it is recognised that this potentially places these technologies at a competitive disadvantage to existing displacement technologies, they do not contribute to the objective of the *REE Act* of additional electricity generation, and given the uncapped nature of the SRES their inclusion would increase the cost of the scheme to consumers.

DRAFT RECOMMENDATION

R.27. The preliminary view of the Authority is that existing arrangements for displacement technologies should be maintained.

R.28. The preliminary view of the Authority is that no change should be made to the *REE Act* to allow additional displacement technologies.

REFERENCES

Renewable Energy Sub Group 2012, *Report to the Council of Australian Governments' Select Council on Climate Change*, Council of Australian Governments' Review of Specific RET Issues.

Commonwealth, House of Representatives 2012, *Parliamentary Debates*, 8 February, p.369.

CHAPTER 8. DIVERSITY OF RENEWABLE ENERGY UNDER THE RENEWABLE ENERGY TARGET

This chapter considers the current mix of renewable energy generation and whether it is likely to be net beneficial to amend the Renewable Energy Target (RET) to actively promote a more diverse range of renewable energy technologies through the scheme.

The *Renewable Energy (Electricity) Act 2000* (Cth) *(REE Act)* requires the Authority to review the 'diversity of renewable energy access to the scheme constituted by this Act' and to provide a cost-benefit analysis of the environmental and economic impact of that access. This chapter discusses:

- the technology-neutral approach of the RET and current mix of renewable generation capacity in Australia (Section 8.1);
- possible reasons for promoting greater diversity (Section 8.3); and
- the likely implications of adopting measures within the RET to promote diversity (Section 8.4).

8.1. Diversity of access and uptake

Access to the RET scheme is provided to technologies based on a wide range of renewable sources and additional renewable sources can be added by regulations. It is designed to be technology-neutral. This is consistent with the *REE Act* which stipulates an amount of renewable generation to be delivered and establishes a certificate-based market to meet it without preferencing any particular technology.

Under the RET, the Small-scale Renewable Energy Scheme (SRES) and Solar Credits have been used to promote particular small-scale technologies (see Chapter 5). There are also a range of government measures aimed at supporting research and development, and commercialisation of renewable technologies.

The effect of a technology-neutral approach is that the lowest cost technologies will be deployed under the scheme, where the wholesale cost of generation will be lower for some technologies, and thus a lower certificate price is required to be paid by liable electricity retailers to meet their obligations. Some technologies have reduced in cost and become more competitive relative to other technologies, and this is expected to continue with time. Acciona submitted:

> *…the objective is to drive investment in lowest cost technologies…wind for the time being remains the lowest cost technology. However, we note that a range of other technologies including solar PV and concentrating solar thermal are experiencing dramatic reductions in cost. (Acciona, sub.85, p.4)*

While the scheme includes a range of renewable generation technologies, the ability of each potential technology to participate in the wholesale market and generate certificates depends on its market readiness and competitiveness.

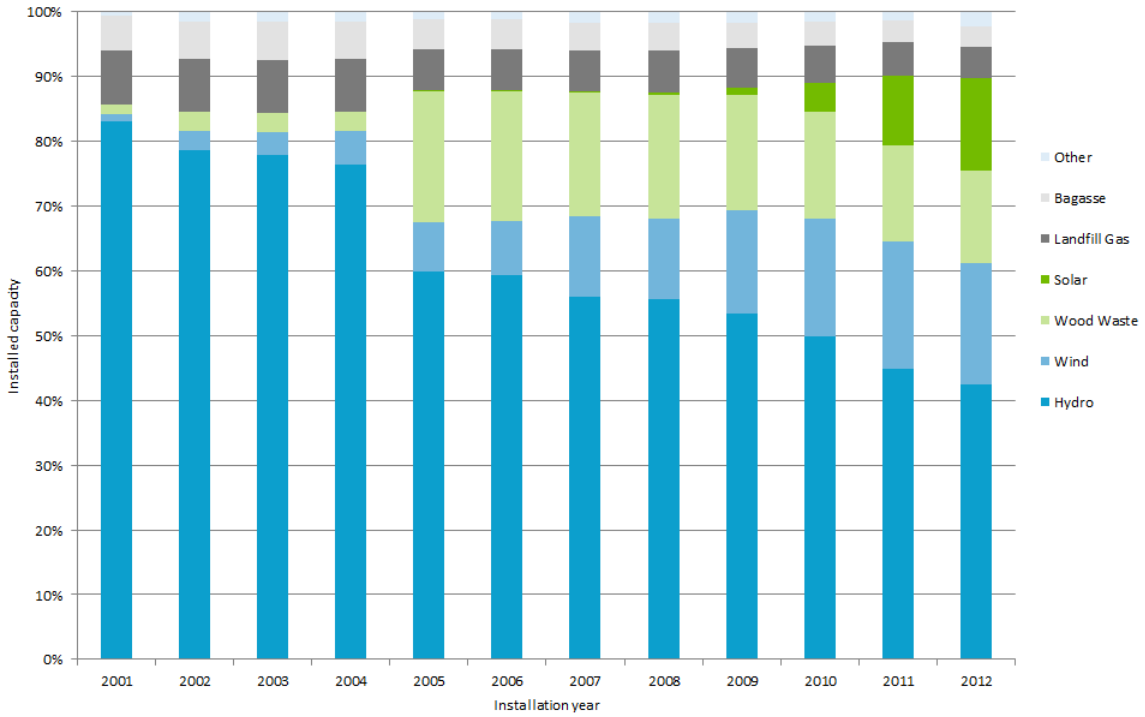
8.2. Current mix of renewable generation capacity

New generation under the RET has primarily come from large-scale wind (around 19 per cent of total accumulative renewable generation in 2012) and bagasse (around 3 per cent) (see Figure 38). There has also been a significant increase in the uptake of small-scale solar photovoltaic (PV) systems and solar hot water heaters under the SRES, with solar PV systems providing approximately 2 gigawatts of generation capacity (Clean Energy Regulator 2012). Hydro has also contributed to renewable generation; however, over the last ten years, its proportional contribution has reduced significantly as the installation of other technologies has increased (from over 80 per cent in 2000-01 to around 42 per cent accumulative renewable generation in 2012).

When the Mandatory Renewable Energy Target commenced operation in 2001, it was projected that biomass (particularly bagasse, the waste from sugar cane milling) would account for most of Australia's additional renewable electricity generation by 2010. However, this projection was proven to be inaccurate as the cost of wind generation fell considerably compared with expectations, and almost all new generation required to meet the targets has come from wind and small-scale solar technologies.

Other potential sources of electricity generation include geothermal and wave. However, technologies utilising both sources are currently high cost and there is no installed capacity of either in Australia. Given the continued decline in costs for wind and solar PV, they appear likely to continue to be the lowest cost and, as a result, the dominant forms of additional renewable generation capacity installed through to 2020.

Figure 38 Technologies as a proportion of total installed renewable capacity, 2001 to 2012 (%)



Note: 2011 and 2012 numbers may still rise as participants have one year to register for certificates
Note: Includes small generation units but not solar water heaters
Source: Clean Energy Regulator, 26 August 2012

8.3. Desirability of greater diversity

Participants have suggested that the RET design should be changed to promote a more diverse range of renewable energy technologies. Participants argue for greater diversity for a number of reasons, including:

- to support the development of a particular renewable industry sector;
- to support the development of higher cost technologies that may become lower cost in the long-term; or
- to support energy security.

The Authority considers that a change to the design of the RET to encourage a more diverse range of renewables than is currently being installed in Australia would only be in the public interest if:

- there are market failures impeding the uptake of some renewable sources, and the benefits of addressing these market failures through changes to the RET would outweigh the costs; or
- energy independence, security and reliability would be enhanced or at least maintained as necessary by additional forms of renewable generation.

8.3.1. Market failures

As discussed above, there may be a rationale for changing the design of the RET to encourage a more diverse range of renewables if there are market failures that are specific to a certain technology type, and are therefore affecting its uptake compared with other renewable technologies.

There may also be a case for supporting the deployment of particular technologies if it leads to 'learning by doing' and this reduces the cost of deployment in the long run relative to other technologies.

The Authority is still investigating potential market failures of this nature, but it would appear that provided that a technology is market-ready, there are no material barriers to participate in the RET.

There may be factors affecting the uptake of particular forms of renewable energy at both the research and development, and demonstration stages, however these market failures are not well addressed by the RET.

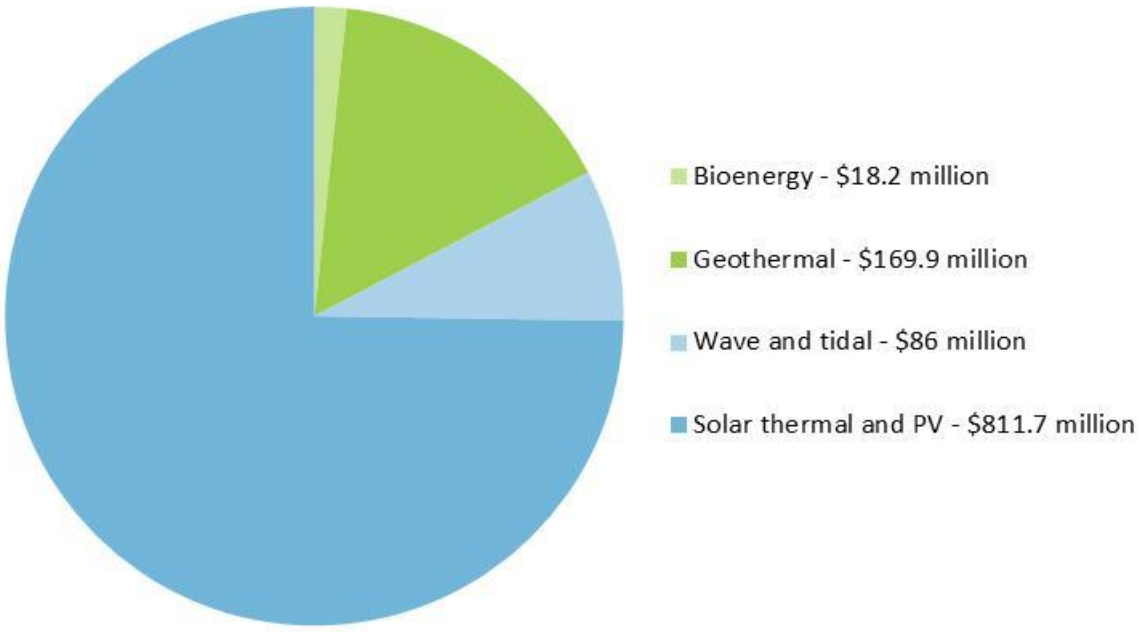
Beyond the RET scheme, there is a range of measures at the national, state and territory level to support the development and deployment of renewable energy technologies (e.g. research and development tax credits, grant funding and financing). As discussed in Chapter 3, the Commonwealth Government recently established the Australian Renewable Energy Agency and the Clean Energy Finance Corporation.

The Australian Renewable Energy Agency is specifically designed to support research and development and address the market failures that might result at that stage of the development cycle. It will provide early-stage grant and financing assistance for projects that strengthen renewable energy and energy efficiency technologies and make them more cost competitive. It will independently administer $3.2 billion of Commonwealth Government support for research and development, demonstration and commercialisation of renewable energy technologies and storage, sharing of knowledge and information.

The Australian Renewable Energy Agency is currently providing over $1 billion of funding for 27 renewable technologies and measures in bioenergy, geothermal, wave, solar thermal and solar PV across the various stages of renewable energy technology innovation. Figure 39 indicates that there is

significant investment going into the development of geothermal and commercial solar thermal and PV technologies.

Figure 39 Investment in renewable energy technologies under Australian Renewable Energy Agency



Source: Australian Renewable Energy Agency

Regarding the deployment of technologies, there may be information failures that increase perceptions of risk among financiers. It may be harder or more costly to secure finance for technologies that are not well understood. The Clean Energy Finance Corporation has been established to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies. The Clean Energy Finance Corporation is designed to bridge any gap between technology which is ready for deployment, but is not currently able to commercially source the requisite level of finance.

8.3.2. Energy dependence, reliability and security

For countries with growing dependence on imported energy where energy security may be an issue, renewables are a strategic option to reduce dependence on imported sources, such as oil and gas that are subject to price uncertainty (International Energy Agency 2011). As a substantial net exporter of energy, Australia does not face any energy security concerns relating to dependence on imports of generation fuels.

It is possible that the intermittency of current dominant renewable sources – particularly wind and solar – could impose increased costs on an electricity network in terms of the stability, reliability and security if these renewable sources comprise a significant proportion of generation capacity.

As noted in the Commonwealth Government's *Draft Energy White Paper* (2011):

> *larger levels of intermittent generation may have implications for maintaining system security … the Australian Government [has stated that it] will continue to monitor the integration of*

new technologies into the grid and may consider undertaking an assessment of the effects on the security and operational safety of the system should these issues become increasingly problematic for networks to manage (p.144)

Although subject to ongoing refinement, the Australian Energy Market Operator has in place arrangements for the National Energy Market that require all significant intermittent generation to participate in central dispatch processes to control the output of such generation at times when that output would otherwise violate secure network limits. In the Western Australian South West Interconnected System, arrangements are also in place to allow the system operator the flexibility to control dispatch of intermittent generation in such a way that power system security will be preserved.

Other electricity networks such as the Northern Territory and the northwest of Western Australia network supplied by Horizon Power are vertically integrated, and make up about 1 per cent of total generation in Australia (ABARES 2011, p.29). As with the National Energy Market and the Western Australian South West Interconnected System, the rules for the operations of these markets are likely to be the most appropriate tools for ensuring the reliability and security of electricity supply across those networks.

Accordingly, changing the RET to promote a more diverse mix of renewable energy sources is unlikely to be an efficient or effective way to address power system security concerns over the emergence of large volumes of intermittent generation.

8.4. Assessment of options to promote greater diversity within the Renewable Energy Target

RET review participants have suggested that measures within the RET can be utilised to promote greater diversity, such as the use of multipliers and banding to promote particular technologies. Several options proposed for altering the RET design to promote greater are discussed below, including multipliers, caps and banding.

It is not clear that amendments to the RET are likely to be the most appropriate policy response even if there is a desire to promote a more diverse mix of renewable energy source. The Authority notes that measures to promote diversity within the RET alter the scheme from a technology-neutral approach that favours the lowest cost technologies to one that favours particular technologies that may not meet the RET's policy objectives or do so at a higher cost.

In its submission, the Clean Energy Council argued that changes to the RET to promote diversity risks harming investor confidence in the scheme and could jeopardise the industry's ability to deliver on the target. Specifically, the Clean Energy Council stated that:

…a production based incentive such as the RET is often of little value to technologies that face a range of challenges and funding hurdles before they reach production stage of their development.(Clean Energy Council, sub.12, p.25)

Measures to promote one particular technology within the RET can lead to other issues. For example, the use of high-value multipliers in the SRES has caused a 'boom bust' cycle in the small-scale solar PV industry, where there have been changes in demand depending on the level of the multiplier.

The Grattan Institute addressed measures within climate change policies to promote diversity of low-emissions technologies in a recent report (Grattan Institute, 2012). The report noted that measures to promote technologies are difficult to manage, and could require government to specify which technologies should be supported. The report states that settings for the RET to promote small-scale

solar PV combined with the dramatic fall in costs led to a significant fall in certificate prices, which resulted in the need to separate the small-scale market from the large-scale market to avoid projects under the latter being unviable (Grattan Institute 2012).

8.4.1. Multipliers

As outlined in Chapter 5, multipliers have been used in the RET scheme to encourage the installation of small generation units such as small-scale solar panels, wind and hydro-electricity systems by multiplying the number of small-scale technology certificates that these systems would usually be able to create under SRES.

Multipliers can be applied to certificates from particular technologies to influence their uptake. The use of a multiplier greater than one will preference a technology – as seen with the Solar Credits multiplier under the SRES. The use of a multiplier less than one "discounts" certificates generated by that technology, which softens the level of growth for that technology.

However, as outlined in Chapter 5, any multiplier greater than one will impose additional cost on consumers as liable entities will pass through the cost of certificates. The environmental effectiveness of the scheme is also reduced because the additional certificates created have not been backed by actual generation. The Australian PV Association submitted:

> *[multipliers have] reduced the effectiveness of the RET by creating large amounts of "Phantom" certificates, with no associated renewable energy generation. It also flooded the REC market, making it difficult for larger projects to be built. (Australian PV Association, sub.101, p.10)*

A multiplier of less than one may discourage the uptake of potentially cheaper technologies, however the Authority has proposed that it be applied to small-scale technologies under the SRES to manage the deployment and associated costs following high demand for these technologies under a higher multiplier.

In its submission, Hepburn Wind proposed that multipliers should be applied to large-scale generation certificates to support community based renewable energy projects to help them compete with larger commercial projects. Hepburn Wind further suggested that community projects could be capped to manage their development.

Applying multipliers followed by capping community projects would be difficult to administer. Certificates are issued at the time of generation under the Large-scale Renewable Energy Target. As noted in the Hepburn Wind submission, renewable energy projects can take a long period to be completed, and would not see the benefits of the multiplier until sometime after the installation is completed.

The Authority considers that the RET is not an appropriate mechanism to provide additional support to community renewable projects above other renewable projects. The RET is designed to promote least-cost renewable energy deployment. If the Government were minded to provide additional support for community-based projects, it would be more appropriately funded via other means.

8.4.2. Caps

Caps limit the total amount of generation from a particular technology. Once a cap for a particular technology has been reached, support would not be given to any additional generation from that technology.

A cap would affect the economic efficiency of the scheme as it might prevent the uptake of the most cost-effective technologies. For example, if a cap were applied to small scale solar as a way of promoting the uptake of other small-scale technologies, this would potentially prevent the installation of the lowest cost technology and increase the risk of not meeting the target..

There could also be perceived equity issues regarding how a cap might be applied. For example, if it operated on a "first-in, first-served" basis – it would preference first movers. Caps are likely to be difficult to administer, since future output is uncertain.

Caps would potentially increase the cost of the scheme, as it would prevent the continued deployment of the lowest cost technologies. Further, if a cap was a combined with a band between two technologies to discourage one while promoting another, it presents a collective risk that the lower cost technology will be suppressed while the higher cost or emerging technology may not be able to meet the target.

8.4.3. Banding

Banding sets a quota of total generation for each technology to meet and is one method to encourage diversity. By assigning particular targets to different technologies, banding allows those technologies the space to evolve without the potential of being crowded out by other technologies that are cheaper in the short term. In practice, the SRES operates as a band within the RET – in effect it provides a separate incentive for small-scale systems.

The establishment of the SRES can be regarded as a form of 'banding' in which a separate arrangement is established to promote the update of particular technologies (see Chapter 5). There is no limit to how many small-scale technology certificates can be created under the SRES, meaning that small-scale technologies essentially have an unlimited band to deploy compared to a 41 000 GWh 'cap' on large-scale generation certificates that need to be purchased by liable entities to meet the RET.

In its submission, the WWF proposed that the RET should include banding, as it will support the development of renewable energy that becomes low cost energy in the longer term:

> *Banding or weighting the RET will give less developed/more costly resources a leg up to develop and bring down their cost curves…[the] banding mechanism is also useful for economic efficiency as a means of phasing industries out of the RET as they become competitive in the open electricity market. (WWF, sub.129, p.12)*

The Authority considers that reasons for supporting technologies, such as those proposed by the WWF, could effectively be addressed by policies outside of the RET, that can in the case of funding programs target support directly at those technologies. This would not create additional administrative burden or risk to the target being achieved.

With regards to using banding as a means of phasing technologies out of the RET, the Authority's preliminary view is that technologies that are at grid parity are commercially competitive and no longer require a RET incentive to meet wholesale costs of generation. This precludes technologies that require support to enter the RET in the first place.

If banding involves both a minimum and a maximum quota for each banded technology, it faces all of the difficulties associated with caps with additional problems associated with minimum targets. If minimum targets are not achieved, then the overall target would not be met. Banding affects the economic efficiency of the scheme by potentially forcing more expensive technologies into the mix, increasing the overall costs to energy consumers.

The Clean Energy Council stated in its submission:

> *Banding requires a level of foresight and prediction into the specific timelines and capabilities of emerging technologies that is near impossible to do accurately … [for example] if the RET were banded to provide a band for a particular technology, it may be that this technology would not be technically capable of delivering that scale of deployment in the timeframe required. This would put achievement of the 20 per cent target at risk. (Clean Energy Council, sub.12, p.25)*

The Geothermal industry has argued for banding to be applied to the technology to allow it to contribute to the RET without being "crowded out" by predominant lower cost technologies. In its submission, the Australian Geothermal Energy Association recommended:

> *…setting aside a reasonable proportion of the incentive offered through the RET Scheme to support emerging technologies as they enter the commercialisation phase. (Australian Geothermal Energy Association, sub.52, p.4)*

However, in a report by the Australian Bureau of Agriculture and Resource Economics and Geoscience Australia (2010) it was noted that:

> *There are uncertainties in the outlook for geothermal power over the next two decades. A major uncertainty is the cost of electricity production as the technology has yet to be proven commercially viable. Present estimates show a wide range in the cost of geothermal electricity generation, reflecting the current pre-commercial stage of the industry, as the cost of electricity generation is highly dependent on future technology developments and grid connection issues. The geothermal industry in Australia is progressing, with proof-of-concept having been attained in one project and expected to be achieved in at least two others within one to two years. Several pilot projects are expected to be completed within five years. (ABARE and Geoscience Australia, 2010, p.205).*

Continued investment will be needed for geothermal to achieve market readiness, after which time it would be able to create certificates under the Large-scale Renewable Energy Target. If a band were introduced for geothermal alone, it presents the risk that an emerging technology may have difficulty in meeting its expected level of generation, which would have implications for the overall target.

8.5. Conclusion

The RET allows a diverse range of technologies to generate certificates. The current mix of generation capacity reflects technologies that have been deployed at the lowest cost. The Authority's preliminary view is that this approach should continue, so long as the future mix deployed under the RET does not affect the reliable delivery of electricity within networks.

The RET supports the most efficient technology to be utilised. Any measure within the RET to promote diversity, such as expanding the use of multipliers, introducing banding or caps, will increase the cost of the scheme to consumers.

Other policy responses, particularly the Australian Renewable Energy Agency and the Clean Energy Finance Corporation, are better placed to promote diversity.

DRAFT RECOMMENDATION

R.29. The preliminary view of the Authority is that no change should be made to the Renewable Energy Target framework to promote diversity.

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CHAPTER 9. SRES ADMINISTRATION

This chapter examines key aspects of administering the Small-scale Renewable Energy Scheme (SRES), including accreditation, deeming arrangements and the collection of generation returns and out-of-pocket expense data.

Submissions received in response to the Renewable Energy Target (RET) review issues paper suggested that, overall, administrative arrangements regarding the Large-scale Renewable Energy Target (LRET) were operating effectively. However, a (relatively small) number of issues were identified regarding the administration of the SRES.

This chapter considers the appropriateness and efficiency of current administrative arrangements for the SRES in relation to:

- accreditation of products and installers (section 9.1);
- arrangements to provide upfront 'deeming' of certificates to cover generation from small-scale systems (section 9.2);
- the requirement to submit a solar water heater and small generation unit returns for installations that generate over 250 certificates (section 9.3); and
- collection of out-of-pocket expense data by the Clean Energy Regulator (section 9.4).

9.1. Accreditation

9.1.1. Current situation

The Clean Energy Council, a peak national industry body representing the clean energy sector, is solely responsible for managing the accreditation of designers and installers of small generation units.

Installers and designers of small generation units must be accredited with the Clean Energy Council in order for the owners of those systems to be eligible to create small-scale technology certificates under the RET. Box 13 sets out the registration and certificate creation process.

The Clean Energy Council runs an accreditation program for the design and installation of solar photovoltaic (PV) systems with an additional endorsement available for small wind and hydro systems. The aim of the program is to improve the safety, performance and reliability of systems; encourage industry best practice; provide a network of competent designers and installers; and to ensure public confidence in the design and installation work. The Clean Energy Council's accreditation department takes advice from its Renewable Energy Standards, Training and Accreditation Committee, which includes industry members with wide experience with renewable energy and specialist advisors.

Box 13 Registering to create certificates

How to register

The entitlement to create certificates is vested in the owner of the small-scale technology system (usually the property owner). Owners must register with the Clean Energy Regulator and pay a fee before they can create their certificates in the online Renewable Energy Certificate (REC) Registry. Following is the process to register with the Regulator in order to create certificates:

- complete application on Regulator's website including online proof of identity check;
- create account in REC Registry (online database for the creation, transfer and surrender of certificates);
- await assessment and approval from Regulator (up to six weeks); and
- pay a $20 registration fee.

In practice, however, nearly all system owners choose to assign their right to create certificates to a registered agent. Registered agents aggregate small parcels of certificates from system owners into larger parcels and sell them to liable parties. The process to become a registered agent is the same as outlined above and involves a registration fee of $250.

How certificates are created

The *Renewable Energy (Electricity) Act 2000* (Cth) prescribes that certain requirements must be met before certificates can be created. These requirements differ depending on the type of technology (e.g. solar PV, solar water heaters) that has been installed. To be eligible for creating certificates, the following requirements apply.

For solar water heaters:

- the brand and model of the unit must be listed on the Clean Energy Regulator's *Register of solar water heaters*;
- the unit must have been installed within the previous 12 months; and
- the unit must be capable of producing hot water delivered from solar energy.

For small generation units (including solar PV):

- the unit must have been installed within the past 12 months and be capable of producing electricity;
- the inverter (and the solar panels in the case of solar PV) must be approved by the Clean Energy Council;
- the system must have all electrical wiring undertaken by a licensed electrician;
- the system must be designed and installed by a person who is accredited by the Clean Energy Council and has $5 million of public liability insurance; and
- the system must be installed in accordance with all other state or territory requirements and relevant Australian Standards.

The person creating certificates must also have written statements from the installer confirming the above requirements have been met before certificates can be created.

Once the applicant has registered with the Clean Energy Regulator, certificates may only be created by completing an online form in the REC Registry. Correct completion of the online form confirms the applicant's eligibility to create certificates, and that the applicant is allocated the correct number of certificates.

The accreditation program requires a minimum level of training which is provided by registered training organisations throughout Australia. A practical assessment of an installer's work is undertaken before full accreditation is granted.

The Clean Energy Council also maintains a list of solar panels and inverter products that meet relevant Australian standards. Accredited installers can only install products from this list otherwise they are in breach of the Council's Code of Conduct.

9.1.2. Opening accreditation to competition

Currently, the Clean Energy Council is the only organisation under the legislation that can accredit small generation unit installers for the purposes of creating small-scale technology certificates. The appropriateness of a single accreditation system has been raised as a key issue in some submissions from solar industry groups. The Australian Solar Council stated:

> *The Act creates a legislated monopoly for the accreditation of small-scale renewable energy technologies, ensuring that only one non-government agency has been given that power. Legislated monopolies are poor public policy, and the lack of competition appears to have resulted in some less than best practice outcomes. (Australian Solar Council, sub.62, p.10)*

This point was reiterated by Solar Energy Industries Association, which also commented on the level of service provided under the current arrangements:

> *The feeling in the industry is that under the current monopoly arrangements for accreditation, it is being used as an easy income stream rather than a prime concern for the level of training needed to ensure the industry reputation remains high and intact and systems are safe.*
>
> *There have been many concerns raised by members of our Association regarding the accreditation requirements and procedures and prices. Many of the training modules required are inadequate to fully teach people and many are starting out in the industry with insufficient knowledge. (Solar Energy Industries Association sub.117, p.3)*

In principle, opening the current arrangements to competition would be in the interests of economic efficiency as it could allow installers and designers to choose the provider that best meets their needs rather than imposing one particular model of quality assurance. In addition, it could help ensure that an accreditation body remains focused on enhancing the relevance, quality and value of the services for their members.

Arguably a risk of opening up accreditation to organisations other than the Clean Energy Council is that greater competition could drive poor outcomes for customers. This could occur if profit motives encouraged instances of poor quality assurance, thereby diluting public confidence in the accreditation system.

This risk could be mitigated by requiring the Clean Energy Regulator to put in place an effective regime to certify installers and products for the purpose of creating small-scale technology certificates. For example, relevant criteria for assessing suitability could include evidence of technical expertise, standards, and compliance arrangements.

On balance, the Authority's preliminary view is that the *Renewable Energy (Electricity) Regulations 2000* (Cth) (*REE Regulations)* should be amended to allow accreditation bodies other than the Clean Energy Council on the grounds that it has the potential to improve the quality and value of services to industry. At the same time, to ensure that accreditation bodies are of an appropriate standard, provision

should be made for the Clean Energy Regulator to develop a regime to approve and revoke an accreditation body's participation in SRES with reference to an appropriate set of criteria.

The Authority also notes that while solar PV and solar water heaters require accredited components, small wind and hydro systems do not (see Table 13). While small wind and hydro installations make up a small percentage of total installations, the Authority's preliminary view is that it is in the public interest that all renewable products meet a minimum level of safety and performance. Furthermore, raising the standards required from these products could enhance community confidence and thereby help to ensure a more sustainable platform for these industries in the future.

Table 13 Technology type and accreditation arrangements

Small-scale technology	Accredited installer?	Accredited component?
Solar PV	Yes	Yes
Wind	Yes	No
Hydro	Yes	No
Solar water heaters	No	Yes

DRAFT RECOMMENDATION

R.30. The preliminary view of the Authority is that the small-scale accreditation system should be open to accreditation bodies other than the Clean Energy Council. Provision should be made for the Clean Energy Regulator to develop to develop a regime to approve accreditation bodies.

R.31. The preliminary view of the Authority is that wind and hydro products should require accreditation to be eligible to create certificates.

9.2. Deeming

9.2.1. Current situation

Small-scale systems are 'deemed' to generate or displace an amount of electricity over a period of time using a calculation contained in the *REE Regulations*. Different calculations and assumptions apply to different small-scale technology systems based on the type of the technology, the capacity of a system, the location it is installed and the amount of years for which certificates are being allocated.

Deeming aims to ensure that the total number of certificates allocated is close to the total amount of generation or displacement and needs to account for systems that perform poorly or not at all, as well as systems that perform better than average. If the deeming calculation is too generous then an unnecessary cost is placed on society for generation that may not be achieved. Conversely, if the deeming calculation significantly underestimates the performance of a technology then it may not provide an incentive that is equitable relative to other renewable energy technologies.

Solar water heaters are provided with ten years' worth of certificates up front, based on the average lifespan and warranties offered at the time the scheme commenced. Originally, small generation units had the option of receiving either one or five years' worth of certificates up front. If the system was still operational after this time then certificates could then be created for another period. The 2003 Mandatory Renewable Energy Target review made recommendations that solar PV systems be allowed to create certificates for a 15 year period. This was recommended in order to reduce administration

costs, provide more upfront assistance with the purchase of solar PV systems, and was reinforced by solar panel manufacturers offering 25 year warranties on their products. In 2007 the *REE regulations* were amended to allow solar PV systems to be eligible for certificates for either one, five or 15 years.

9.2.2. Accuracy of deeming

The accuracy of the deeming calculations for both solar PV and solar water heaters was identified as an issue in some submissions. Some solar panel installers believe that a well installed solar panel installation in some parts of Australia can generate more electricity than the amount allocated in equivalent certificates. Others believe that there is a significant number of systems poorly installed, poorly maintained or even no longer operating, thereby giving rise to suggestions that the deeming calculation is too generous. For example, International Power-GDF Suez stated in their submission that:

> *the use of deeming to provide certificates is excessively generous….customers would literally be paid (by other consumers) for something which does not exist. (IPR-GDFS, sub.83, p.9)*

For solar water heaters, it has been suggested that the usage patterns contained in Australian Standards are no longer accurate as water usage has reduced in recent years. Water usage patterns are required as inputs to the calculation of the energy savings from a solar water heater. A change in water usage patterns may affect the number of certificates provided to solar water heaters.

An individual participant commented on this issue and stated:

> *Deeming for [SRES] participants overcomes upfront capital cost problems and reduces the need for monitoring and reporting outcomes. The AS/NZS 4234 solar and heat pump water heater deeming calculations are reasonable as they are based on laboratory tests and annual performance simulations and the [small-scale technology certificate] allocation depends on the performance of the heater. (Harry Suehrcke, sub.152, p.3)*

In relation to the provision of 15 years' worth of certificates up front, Alinta Energy stated:

> *There has been concern expressed at the creation of small-scale certificates deemed for 15 years where there exist valid questions as to the longevity of the particular small-scale assets in receipt of certificates. (Alinta Energy, sub.89, p.8)*

Conversely, submissions from solar industry groups supported continuing with the current deeming arrangements. The Australian PV Association cited efficiencies as a reason to retain deeming stating:

> *deeming is an appropriate way of managing large numbers of small installations. The significant overhead cost of metering, measuring, reporting, and transacting [certificates] for small systems far outweighs the benefits they would bring (Australian PV Association, sub.101, p.9)*

The Clean Energy Council also supported deeming as it believed it provided greater access to solar for lower socio-economic groups:

> *it has allowed the technology to be affordable to a large proportion of Australian households, which is why analysis of the postcodes data of where PV systems are being installed, reveals the most popular areas are those lower socio-economic communities like Dubbo (NSW) and Caloundra (Qld). [Feed-in tariffs] do not have the same effect even if they create the same or better pay-back periods because the upfront cost is the greatest barrier to uptake." (Clean Energy Council, sub.12, p.21)*

The REC Agents Association did not consider reducing the number of years of deeming to be appropriate as it would discourage uptake. In their submission, they noted that before the current 15 year deeming option was available for solar:

> *only around 5 to 10% of certificates that could be created were ever created due to high transactional costs for the values involved. (REC Agents Association, sub.47, p.11)*

The Authority understands the Clean Energy Regulator has made some preliminary investigations into the deeming calculations for solar PV and solar water heaters. Based on these investigations, the Regulator has indicated that actual performance is broadly in line with deemed levels of output. This view was also shared by some submissions who believed that whilst deeming had its faults, it was the most practical way of providing a benefit. The Australian Solar Society stated:

> *While deeming is not perfect, it seems that moving to a generation based approach would require a level of coordination and cooperation from retailers and (in most cases) Network Operators and their "smart meters" that would be difficult to achieve at a small scale level. (Solar Business Council, sub.50, p.9)*

This was supported by Ergon Energy which stated:

> *deeming provides a simple valid method of determining the amount of likely generation and that providing a capital expenditure subsidy at installation stage is administratively more efficient than any attempt at life cycle payments … if deeming is to continue long term, then periodic testing against actual outcomes should be undertaken. (Ergon Energy, sub.88, p.10)*

Based on current evidence, the Authority's preliminary view is that the existing deeming rates arrangements remain appropriate. Nevertheless, the Authority would support the Clean Energy Regulator continuing to undertake periodic reviews of deeming arrangements to ensure that they remain appropriate.

As noted in Chapter 5, the Authority is continuing to consider whether the threshold for a small-scale solar PV system should be reduced below its current 100 kW limit. It is also considering whether shorter deeming periods (such as five years at a time) should be considered for larger PV systems. Input on these issues are welcomed.

DRAFT RECOMMENDATION

R.32. The preliminary view of the Authority is that the existing deeming arrangements remain appropriate.

R.33. The Authority is continuing to consider whether, in conjunction with any reduction in the threshold for a small-scale solar photovoltaic system below 100 kilowatts, any shortening of the deeming period for larger sized units would be appropriate.

9.3. Generation returns

Section 23F of the *Renewable Energy (Electricity) Act 2000* (Cth) (*REE Act*) requires any registered person that creates more than 250 certificates (they do not need to be valid) in a calendar year to lodge a 'solar water heater and small generation unit return' to the Clean Energy Regulator. The *REE Regulations* dictate what information must be included in the return. The growth in the solar PV market and the addition of the clearing house has led to more participants, particularly households, becoming liable to submit returns.

The solar water heater and small generation unit return is intended to provide the Regulator with quantitative and qualitative data such as:

- the number of systems and certificates the registered person created; and
- if any applications for certificates were failed by the Regulator and, if so, how many and why.

Nevertheless, the Authority understands that most of the information that is submitted as part of the above arrangements is already available to the Clean Energy Regulator via the REC Registry. Importantly, and unlike the data from the generation returns, the REC Registry provides the Regulator with current and accurate details of a registered person or agents' activity to evaluate their performance.

The Clean Energy Regulator has advised the Authority that the time taken for a registered person to complete a return varies, depending on their level of activity and the quality of their record keeping, from 30 minutes to several hours. In addition, it is estimated that it will take the equivalent of half a year for a fulltime employee at the Regulator to assess and respond to the 600 returns due to be received in 2012. Accordingly, there appears to be a clear administrative burden associated with generator returns; the Authority is investigating its magnitude with the Clean Energy Regulator.

The Authority's preliminary view is that the legislative requirement to produce a return should be removed on the grounds of economic efficiency. The administrative costs are not justified given there does not appear to be any clear benefit from collecting the information.

DRAFT RECOMMENDATION

R.34. The preliminary view of the Authority is that the requirement to submit a solar water heater and small generation unit return should be removed from the *Renewable Energy (Electricity) Act 2000* (Cth).

9.4. Out-of-pocket expense data

As discussed in Chapter 5, one of the items the Minister must take into consideration when reducing the clearing house price is the contribution system owners make towards the cost of their system.

Regulation 19G of the *REE Regulations* requires that the net cost of the system (total cost of the system and installation, less the benefit from the small-scale technology certificates) must be provided to the Regulator at the time certificates are created in the REC Registry. This information must be published on the Regulator's website every quarter.

Many of the parties that create certificates are the same parties who install systems. Accordingly, there is an incentive for these operators to provide the Regulator with a high estimate of the out-of-pocket expense to reduce the possibility of the clearing house price being reduced.

It is important to accurately collect the net cost of systems to ensure that subsidies are appropriate. However, the Authority believes it is difficult under current arrangements for the Regulator to ensure that accurate figures are being provided to them.

The Authority's preliminary view (see Chapter 5) is that this information would be more effectively and efficiently collected through surveys.

DRAFT RECOMMENDATION

R.35. The preliminary view of the Authority is that the requirement to provide the out-of-pocket expense data for a small generation unit installation should be removed from the *Renewable Energy (Electricity) Act 2000* (Cth).

REFERENCES

Renewable Energy (Electricity) Act 2000 (Cth)

Renewable Energy (Electricity) Regulations 2001 (Cth)

APPENDIX A. LETTER FROM THE MINISTER FOR CLIMATE CHANGE AND ENERGY EFFICIENCY TO THE CHAIR OF THE CLIMATE CHANGE AUTHORITY

Minister for Climate Change and Energy Efficiency
Minister for Industry and Innovation

Mr Bernie Fraser
Chair
Climate Change Authority
GPO Box 1944
MELBOURNE VIC 3011

Dear Mr Fraser Bernie

I write to you concerning the Climate Change Authority's statutory review of the Renewable Energy Target (RET) scheme.

I first of all would like to take the opportunity to once again thank you for agreeing to lead the Authority and note the very important role it has to play in advising the Government on the operation of the key components of the Clean Energy Future plan. I intend writing to you again in the near future to set out the Government's expectations generally in relation to the role the Authority, its relationships with the Government and Department of Climate Change and Energy Efficiency, and issues of corporate governance, communication and financial management.

As you are aware, the Authority's first significant task is to review and report on the operation of the RET scheme (the Review) before the end of 31 December 2012. The parameters of the Review, including its scope, consultation requirements and timelines, are set out in Section 162 of the *Renewable Energy (Electricity) Act 2000*. This includes the requirement that the Climate Change Authority's recommendations cannot be inconsistent with the objects of the Act.

The Government recognises that renewable energy will play a crucial role in a clean energy future. As such, promoting innovation and investment in harnessing our abundant renewable energy resources is a key element of the Clean Energy Future plan.

The RET scheme, as an integral part of the Government's plan, is designed to deliver the Government's commitment that the equivalent of at least 20 per cent of Australia's electricity supply will come from renewable sources by 2020. Renewable energy investors have been assured by the Government of our ongoing commitment to this target, to provide confidence for their investment decision making.

The RET scheme will work alongside the carbon price, the Australian Renewable Energy Agency and the $10 billion Clean Energy Finance Corporation (CEFC) recently established through legislation, to speed up the deployment of renewable energy technologies, helping smooth Australia's transition to a clean energy future. These policies and institutions are intended to be mutually supportive and work together to enhance clean energy outcomes for all Australians.

In the long term, transformation of our electricity supply to renewable and low emissions sources is essential to cutting our national emissions and remaining competitive in a carbon constrained world. The carbon price will drive investment in clean energy sources such as

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APPENDIX B. CONSULTATION

The Climate Change Authority is undertaking extensive consultation during the RET Review. To assist interested parties contribute to the review, the Authority released an issues paper on 20 August 2012.

Approximately 8 700 submission were received, which included around 8 500 campaign submissions (from the supporters of GetUp and Hepburn Wind) and 170 non-campaign submissions. A list of those non-campaign submissions received (which are not bound by confidentiality) are listed below. These submissions are published on our web site at http://climatechangeauthority.gov.au/submissions/received.

In addition to this formal submissions process, the Authority has also met with a wide range of stakeholder groups from business, industry and the environment and social welfare sectors.

Table 14 Submissions received

100% Renewable Community Campaign	ACCIONA
Advanced Energy Consulting	AECOM Australia
AGL Energy	Alinta Energy
Alstom Limited	Alternative Technology Association
Amcor Packaging (Australia)	Andrew Smethurst
Anthony Yeates	Australian Aluminium Council
Australian Coal Association	Australian Conservation Foundation
Australian Energy Market Commission	Australian Energy Market Operator
Australian Forest Products Association	Australian Geothermal Energy Association
Ai Group	Australian Industry Greenhouse Network
Australian Paper	Australian Petroleum Production and Exploration Association
Australian PV Association	Australian Solar Council
Australian Solar Thermal Energy Association	Australian Sugar Milling Council
Australian Youth Climate Coalition	Barbara J Fraser
Barry Murphy	Beacons Consulting
Beyond Zero Emissions	BHP Billiton – Illawarra Coal
Business Council of Australia	Cement Industry Federation
Central NSW Renewable Energy Committee	Chevron Australia
Chris Hinchcliffe	Chris Mount
Clean Energy Council	CleanSight
Climate Action Hobart	Climate and Health Alliance
Climate Markets and Investment Association	ClimateWorks Australia
Conservation Council of South Australia	Continental Wind Partners and Wind Prospect
Coronium	Dandenong Ranges Renewable Energy Association
David Hamilton	David Osmond

Doctors for the Environment Australia	DUT
EDO NSW	Energetics
Energy Developments	Energy Networks Association
Energy Retailers Association of Australia	Energy Supply Association of Australia
Energy Users Association of Australia	Enhar
EnviroGen	Enviromate Commercial
Epuron	Eraring Energy
Ergon Energy	Eurobodalla Sustainable Devices
EvolveSmart	First Solar (Australia)
Gas Industry Alliance	General Electric
Geodynamics	GetUp
Glen Wright	Goldwind Australia
Government of Tasmania	Grattan Institute
Greer Taylor	Harry Suehrcke
Hepburn Wind	Hidro+ Technology
Horizon Power	Hydro Tasmania
Infigen Energy	International Power-GDF SUEZ Australia
Investor Group on Climate Change	IPART
James Kwok	James Wight
Joe Hallenstein, HannahClare Johnson, Scott MacKinnon, Ngaire McGaw, Fiona McKeague, Ko Oishi and Madeleine Payne	John Poppins
Julie Congdon	Kai Mildner
Keppel Prince Engineering	Lake Macquarie City Council
Landfill Gas and Power	Latrobe Valley Sustainability Group
LMS Energy	M Ballantine Industrial Electrical
Major Energy Users	Marion Cook
Mark Coster	Melanie Mildner
Meridian Energy Australia	Milan Mitic
Minerals Council of Australia	MirusWind
MT Energie	National Farmers' Federation
National Generators' Forum	Origin Energy
Pacific Hydro	Pamela Reeves
Peter Campbell	Peter Doumouras
Power and Water Corporation	Professor Ian Johnston
Qenos	Queensland Minister for Energy and Water Supply
RATCH-Australia	REC Agents Association
REpower Australia	RES Australia
Rio Tinto	Rob Stokes MP
Robin Morgan	Rodney Lowe
Ross Garnaut	RPG Australia
Samsung C&T	Sienna Mildner
Sinovel Wind Group (Australia)	Snowy Hydro

Solar Business Council	Solar Energy Industries Association
Solar Matrix	Australian Solar Thermal Energy Association
Stanwell Corporation	Steven Boer
Sucrogen Australia	Sustainable Energy Now
Sydney Water	The Chamber of Minerals and Energy of Western Australia
The Climate Group	The Climate Institute
TRUenergy	UNION FENOSA Wind Australia
Vestas Australian Wind Technology	Vic McDonald
Visy	WestGen
WestWind Energy	William Adlong
Wind Prospect	Windlab Systems
Wollongong Climate Action Network	WWF Australia
Yarra Ranges Council	Yarrow Andrew

GLOSSARY OF TERMS

Term	Acronym/ abbreviation	Explanation
Australian Energy Market Operator	AEMO	The Australian Energy Market Operator was established in 2009 and is responsible for the operation of the National Electricity Market which includes the east and south east regions of Australia (Queensland, New South Wales, Victoria, Tasmania and South Australia).
Australian Renewable Energy Agency	ARENA	The Australian Renewable Energy Agency is an independent statutory authority established under the *Commonwealth Authorities and Companies Act 1997*, tasked with the objectives of improving the competitiveness of renewable energy technologies and increasing the supply of renewable energy in Australia.
1997 Baseline		During the process of accreditation for a power station under the Renewable Energy Target the Clean Energy Regulator determines a baseline value for generation prior to 1997 (when the scheme was first proposed). The baseline is generally calculated by using the average amount of annual electricity generated from eligible renewable energy sources in 1994, 1995 and 1996.
Bankable certificates		Renewable energy certificates for both the large-scale and small-scale market do not have an expiry date. They may be purchased and held for any length of time before they are surrendered.
Certificate costs		The amount passed on by liable parties (generally electricity retailers) to end-users to account for the costs of purchasing and surrendering Large-scale Generation Certificates (LGCs) and Small-scale Technology Certificates (STCs)
Carbon pricing mechanism		The carbon pricing mechanism creates a price on emissions by requiring large emitters to report on, and surrender emissions units for, their covered emissions. The mechanism is put in place by the Clean Energy Act 2011 and related legislation, and commenced operation on 1 July 2012.
Clean Energy Finance Corporation	CEFC	The objective of the Clean Energy Finance Corporation is to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies.
Clean Energy Regulator	CER	The Clean Energy Regulator is an independent statutory authority that administers regulatory schemes relating to clean energy, including the Renewable Energy Target, the Carbon Pricing Mechanism, the National Greenhouse and Energy Reporting scheme and the Carbon Farming Initiative.
Climate Change Authority	'the Authority'	Established on 1 July 2012, the Climate Change Authority provides independent advice on the operation of Australia's carbon price, emissions reduction targets, caps and trajectories, and other Australian Government climate change initiatives.
Compliance period		A full calendar year, the period over which each annual target under the Renewable Energy Target must be achieved.
Council of Australian Governments	COAG	The Council of Australian Governments is the peak intergovernmental forum in Australia. The members of the Council of Australian Governments are the Prime Minister, State and Territory Premiers and Chief Ministers and the President of the Australian Local Government Association.

Term	Acronym/ abbreviation	Explanation
Department of Climate Change and Energy Efficiency	DCCEE	The Department of Climate Change and Energy Efficiency leads the development and coordination of Australia's climate change and energy efficiency policy. It is responsible for policy advice, policy implementation and program delivery in four areas: reducing Australia's greenhouse gas emissions; promoting energy efficiency; adapting to climate change; and helping to shape a global climate change solution.
Deeming		The estimation of the amount of electricity a solar panel or small-scale wind or hydro system generates, or the electricity a solar water heater or heat pump displaces. Deeming allows the owners of these technologies to receive their entitlement to small-scale technology certificates before the system has produced or displaced the electricity.
Emissions-intensive trade-exposed	EITE	Businesses conducting specified emissions-intensive trade-exposed (EITE) activities are eligible for assistance through the Jobs and Competitiveness Program under the carbon pricing mechanism and under the RET scheme.
Energy Savings Initiative		Under the Clean Energy Future Plan the Australian Government committed to do further work to investigate the merits of a national Energy Savings Initiative (ESI). An ESI is a market-based tool for driving economy-wide improvements in energy efficiency.
Gigawatt hours	GWh	A measure of electricity generation / use over a period of time (or energy).
Kilowatt	kW	A measure of power (or demand).
Kilowatt hour	kWh	A measure of electricity generation / use over a period of time (or energy).
Kyoto Protocol		An agreement adopted under the United Nations Framework Convention on Climate Change in 1997. It entered into force in 2005.
Large-scale Generation Certificate	LGC	A Large-scale Generation Certificate represents one megawatt hour of renewable energy generation.
Liable entities		Entities that make wholesale acquisitions of electricity and are required by the legislation to surrender a specified number of renewable certificates or pay a renewable energy shortfall charge.
Large-scale Renewable Energy Target	LRET	The Large-scale Renewable Energy Target encourages the deployment of large-scale renewable electricity projects such as wind farms.
Mandatory Renewable Energy Target	MRET	The Mandatory Renewable Energy Target began operation in 2001. The Mandatory Renewable Energy Target had a target of 9,500 Gigawatt hours in 2010 (mandated out to 2020) and interim targets that gradually increased year on year.
Megawatt	MW	A measure of power (or demand).
Megawatt hour	MWh	A measure of electricity generation / use over a period of time (or energy).
National Electricity Market	NEM	The National Electricity Market interconnects five regional market jurisdictions (Queensland, New South Wales, Victoria, South Australia and Tasmania). Western Australia and the Northern Territory are not connected to the National Electricity Market.
Native demand		Electricity load serviced by scheduled electricity generation, semi-scheduled generation and embedded generation (including rooftop solar PV)
Partial exemption certificate	PEC	The Renewable Energy (Electricity) Act 2000 and the Renewable Energy (Electricity) Regulations 2001 include provisions to provide partial exemption from Renewable Energy Target liability for electricity used in defined emissions-intensive trade-exposed activities. To obtain exemption, prescribed persons may apply to the Clean Energy Regulator for a partial exemption certificate.
Renewable Energy Certificate	REC	The term used for renewable energy certificates generated under the Renewable Energy Target scheme prior to 2011.

Term	Acronym/ abbreviation	Explanation
Renewable Energy (Electricity) Act 2000 (Cth)	*REE Act*	The legislative framework for the Renewable Energy Target scheme.
Renewable Energy (Electricity) Regulations 2001	*REE Regulation*	The detailed rules and provisions of the Renewable Energy Target scheme.
Renewable Energy Target	RET	The Renewable Energy Target operates in two parts - the Small scale Renewable Energy Scheme and the Large scale Renewable Energy Target.
Renewable Energy Target review	RET review	The Climate Change Authority's review of the Renewable Energy Target. The review is defined in Section 162 of the Renewable Energy (Electricity) Act 2000 (Cth).
Renewable Power Percentage	RPP	The Renewable Power Percentage establishes the rate of liability for the Large-scale Renewable Energy Target and is the mechanism that liable entities use to determine how many Large-scale Generation Certificates need to be surrendered to discharge their liability each year.
Shortfall charge		A charge that applies to the outstanding amount when a liable entity surrenders less than the required number of certificates to meet obligations under the LRET or SRES. The shortfall charge under both the LRET and SRES is currently set at $65.
Solar credits		Solar Credits work by multiplying the number of certificates that eligible small generation units would generally be able to create under the standard deeming arrangements for the Small-scale Renewable Energy Scheme.
Solar photovoltaic	PV	Solar photovoltaic is a method of generating electricity by converting the sun's energy into electricity
Small-scale Renewable Energy Scheme	SRES	The Small-scale Renewable Energy Scheme supports the installation of small-scale systems, including solar photovoltaic systems and solar water heaters, and small generation units.
Small-scale Technology Certificate	STC	Certificates created by small-scale technologies like solar panels and solar water heaters.
Small-scale Technology Certificate Clearing House	STC Clearing House	The Small-scale Technology Certificate Clearing House facilitates the exchange of small-scale technology certificates between buyers and sellers at the fixed price of $40 (excl. GST).
Small-scale Technology Percentage	STP	The Small-scale Technology Percentage establishes the rate of liability for the Small-scale Renewable Energy Scheme. The Small-scale Technology Percentage is the mechanism that liable entities use to determine the number of Small-scale Technology Certificates needed to be surrendered to discharge their liability quarterly.
South West Interconnected System	SWIS	The South West Interconnected System is the electricity network that services a majority of Western Australia's population.

ABBREVIATIONS AND ACRONYMS

Term	Meaning
AEMO	Australian Energy Market Operator
Ai Group	Australian Industry Group
ARENA	Australian Renewable Energy Agency
CEFC	Clean Energy Finance Corporation
CO2	Carbon dioxide
CO2-e	Carbon dioxide equivalent
COAG	Council of Australian Government
EITE	Emission-intensive trade-exposed
ESAA	Energy Supply Association of Australia
GST	Goods and Services Tax
GW	Gigawatt
GWh	Gigawatt hour
IEA	International Energy Agency
IPART	Independent Pricing and Regulatory Tribunal
JCP	Jobs and Competitiveness Program
kW	Kilowatt
kWh	Kilowatt hour
LGC	Large-scale Generation Certificates
LNG	Liquefied Natural Gas
LRET	Large-scale Renewable Energy Target
MRET	Mandatory Renewable Energy Target
Mt	Million tonnes
MW	Megawatt
MWh	Megawatt hour
NEM	National Energy Market
NSW	New South Wales
GGAS	New South Wales Greenhouse Gas Reduction Scheme
PEC	Partial Exemption Certificate
PPA	Power Purchase Agreement
ppm	Parts per million
PV	Photovoltaic
REC	Renewable Energy Certificate
REE Act	Renewable Energy (Electricity) Act 2000 (Cth)
REE Regulations	Renewable Energy (electricity) Regulations 2000 (Cth)
RET	Renewable Energy Target
RPP	Renewable Power Percentage

Term	Meaning
SGLP	Strong Growth Low Pollution: modelling a carbon price 2001
SKM	Sinclair Knight Merz
SRES	Small-scale Renewable Energy Scheme
STP	Small-scale Technology percentage
STC	Small-scale Technology Certificate
t	Tonne
TJ	Terajoules
UNFCC	United Nations Framework on Climate Change
USD	United States Dollar
WCMG	Waste coal mine gas
WEM	Wholesale Electricity Market (Western Australia)
Wh	Watt hour