The Renewable Energy Target

How it works and what it costs

Prepared for
Australian Industry Greenhouse Network (AIGN)

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1 Overview

Basic operation

- The Renewable Energy Target (RET) is a government intervention designed to mandate the proportion of electricity generated from selected renewable sources. It is a policy that *taxes* electricity users (and in some cases non-renewable generators) in order to *subsidise* selected renewable producers.
- The RET achieves this through the creation of a renewable certificate market. Renewable certificates are issued to renewable generators for the renewable electricity they produce. Liable entities (mostly electricity retailers) must purchase these certificates to cover their liability under the target. The certificate purchase price is usually passed on to electricity consumers.
- Renewable producers receive a *subsidy* when they sell the certificates they have been issued. This subsidy is paid by an effective *tax* on the liable entities that must purchase certificates.

Policy rationale

- The policy rationale for the RET is complex, and has been expressed in multiple ways. At the simplest level, it is clear that the more expensive renewable energy would not be used without specific intervention. However the rationale for the RET itself has a number of elements.
- Most commonly, the RET is seen as a means of reducing greenhouse gas emissions; but the RET only indirectly targets emissions and is a very costly way of doing so. It does not necessarily displace the most emissions intensive non-renewable generation.
- Sometimes the RET is seen as encouraging development of new technologies; but the RET is a production subsidy, not an R&D subsidy. It encourages production of the currently lowest cost existing technologies, not R&D into currently high cost potential technologies.
- The RET is often seen as an energy security measure, encouraging new techniques. However, security of energy supply is not the key policy concern with non-renewable technologies. Further, an increase in cost is not an energy security target.

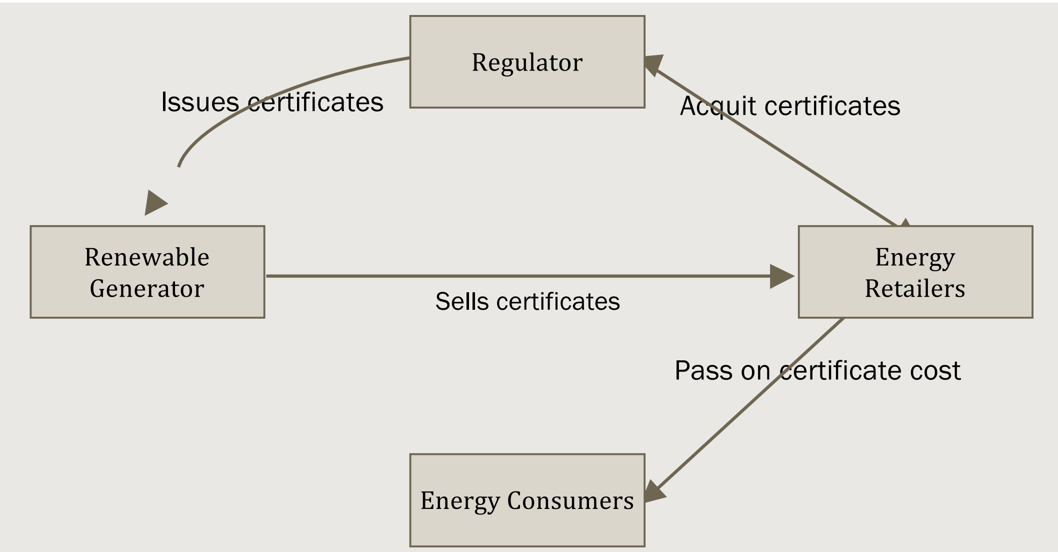
2 A snapshot of the Renewable Energy Target

The scheme basics

The RET is designed to support the Commonwealth Government's policy commitment that at least 20 per cent of Australia's energy supply come from renewable sources by 2020. Based on forecasts at the time, this translated to 45 000 GWh of renewable electricity generation.

The scheme works through the regulator issuing certificates to renewable producers, equivalent to one MWh of eligible renewable energy generated. Liable entities then have an obligation to obtain certificates and surrender them to the regulator. These liable entities (typically electricity retailers but also some generators) effectively purchase certificates from renewable generators. Generally, they pass this cost on to energy consumers. Importantly, the RET does not subsidise all renewable energy. Rather, it covers the generation of only renewable electricity.

2.1 The basic flow of certificates



Source: CIE

A scheme in two parts

The current RET scheme has two parts:

- ***The Large Scale Renewable Energy Target (LRET),*** which offers subsidies to owners of large-scale renewable power stations like wind farms and commercial solar and geothermal schemes. These generators are issued certificates known as Large Scale Generation Certificates (LGCs).

- ***The Small Scale Renewable Energy Scheme (SRES),*** which provides subsidies in the form of Small-scale Technology Certificates (STCs) to households, small businesses and community groups that install eligible small-scale installations such as solar panels, solar water heaters, small-scale wind systems, heat pumps and micro hydroelectric systems.

Certificates issued to renewable generators under the LRET and SRES are equivalent to one MWh of eligible renewable electricity generated. The price of LGCs is determined by the supply and demand for these certificates while the price of STCs is set at $40/STC when sold through the STC Clearing House.

Effects of the RET

The RET acts as a tax on both energy consumers and conventional energy suppliers to fund a subsidy to selected renewable energy generators.

- The requirement for liable entities to purchase renewable energy certificates to acquit their annual RET liability is effectively a tax. These entities, generally electricity retailers, pass the cost of acquiring mandatory certificates onto energy consumers in the form of higher energy tariffs. This is an effective tax on energy consumers.
- In the case of the SRES, sale of certificates help asset-owners offset the high costs of their system. For consumers who are unable to afford such systems in the first place, the SRES acts as a cross-subsidy under which they pay higher electricity prices to help fund a scheme that benefits only selected consumers.
- Conventional energy suppliers — including producers of alternative low carbon fuels — are also affected as a result of downward pressure on wholesale electricity prices from the RET. The RET results in additional supply entering the energy market earlier than would have otherwise needed. This reduces wholesale prices and reduces the revenues obtained by non-renewable generators who do not have access to subsidies under the RET scheme. This in turn reduces the profitability of many fossil fuel generators, including peaking gas fired generators that are substantially less carbon-intensive than conventional coal fired power plants.

Costs to energy users

Because renewable energy is more costly than most non-renewable sources, the RET leads to an increase in the total resource costs of energy generation.

- This increase in cost is estimated to be around $9 billion to 2030-31
- Equivalent to a 6 per cent increase in total energy resource costs (CCA 2012).

The RET’s impact on consumers comes in the form of changes in retail household and business electricity prices. This in turn depends on the net impact of the RET on wholesale prices and on the cost of acquiring renewable energy certificates.

- Broadly, the RET is estimated to increase costs by around $7/MWh in 2012 (ACIL Tasman 2011).
- Various estimates suggest the RET results in a 4 to 5 per cent increase in household electricity costs (see section 3).

- Costs to business customers are estimated to increase by around 5 per cent as a consequence of the RET (CCA 2012). Cost to broad industry sectors:
  - range from $20 million to $50 million per year for food processing;
  - range $20 million to $40 million per year for the wood products and paper industry;
  - are around $120 million per year for the iron, steel and aluminium industries;
  - Are around $50 million per year for other manufacturing.

Costs to non-renewable generators

Through its interactions with energy markets, the RET is expected to lead to reductions in wholesale prices in the near to medium term.

When a renewable energy target is imposed, it increases the supply of electricity in the energy market and a fall in the wholesale price of electricity. Existing non-renewable generators who are not subsidised or compensated under the RET may obtain lower revenues and may find it difficult to cover their capital costs.

- Wholesale prices could be reduced by up to 30 per cent in some years (CCA 2012)
- This in turn reduces the profitability of many fossil fuel generators including peaking gas fired generators that are substantially less carbon-intensive than conventional coal fired power plants
- According to the Australian Energy Market Commission (AEMC), the wholesale price of electricity is forecast to be below the long-run marginal cost of production up until 2030/31 if current policy settings continue (AEMC 2011).

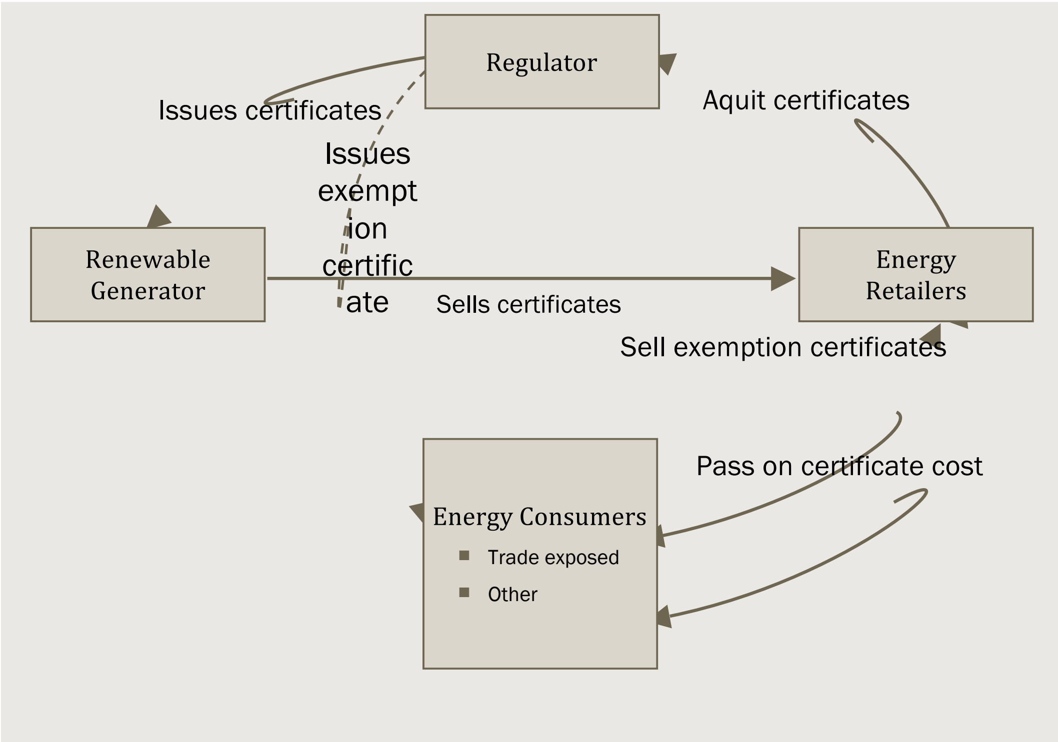
Accounting for trade exposed industries

The RET recognises that some of the higher costs will fall on trade exposed industries.

- It includes provisions to provide partial exemptions from LRET and SRES liability for electricity used in defined emissions-intensive trade-exposed (EITE) activities.
- The rationale for providing assistance to EITE activities is that these businesses operate in an international setting where their competitors do not face similar cost impositions. Many EITE businesses are unable to pass on the additional cost of the RET onto their customers as it can reduce competitiveness as well as investment attraction. As such, some may be compelled to relocate overseas where they do not have to absorb the costs of a renewable energy target. This is undesirable from an Australian industry perspective.
- Eligible trade-exposed activities are assessed for their overall emissions intensity on the basis of historical data, irrespective of the extent to which those emissions are related to electricity use (CCA 2012). There are currently more than 30 eligible EITE activities.
- Companies carrying out EITE activities must apply annually to the regulator for a Partial Exemption Certificate (PEC) and trade the PEC with liable entities at a mutually negotiated value.

- Effectively, this increases the price impacts on non-EITE industries.

2.2 Certificate flow with trade exposed industries



Data source: CIE

Trade exposed industries can still incur significant costs

Depending on emissions intensity, trade exposed companies are entitled to exemptions of either 60 or 90 per cent. However, this exemption only applies to the increase in the target above the initial target of 9.5 TWh and a certificate price of above $40.

- This restriction makes the exemption considerably smaller, reducing the nominal 90 per cent to around 70 per cent for aluminium and steel making, for example.
- Even with exemptions, the cost of the RET to the aluminium sector is around $80 million per year (Climate Change Authority 2012, p.95).

Cost of carbon abatement under the RET

It is generally understood that the RET provides a relatively expensive form of carbon abatement.

> *'…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 promotes more expensive abatement than that currently being encouraged by the carbon price alone.' (Climate Change Authority 2012, p.26).*

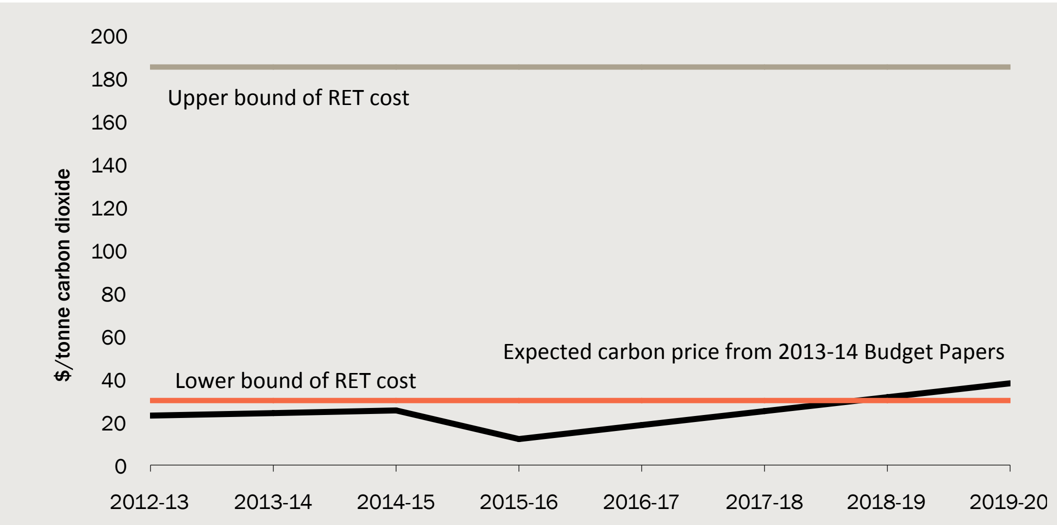
Emissions abatement induced by the RET scheme depends on the emissions avoided from the alternative generation that is displaced by the new renewable generation. It may not necessarily be the case that the most emissions intensive generation is replaced.

- According to the AEMC, the new renewable generation under the LRET and SRES is more likely to displace gas fired generation instead of coal, and particularly brown coal generation, the highest emitting plant in the National Electricity Market (NEM) (AEMC 2011).

The cost of abatement under the RET scheme is equal to the resource cost of producing renewable generation capacity per unit of abatement induced by the scheme.

- While these elements remain uncertain, estimates note the relatively high cost of emissions abatement from the RET, ranging from \$30 to \$185 per tonne of CO_2 (see section 3).
- This is higher than the current, as well as expected, carbon price and raises the cost of abatement to the Australian economy as a whole (chart 2.3).

2.3 Abatement cost of RET compared with expected carbon prices



Data source: CIE estimates from studies cited in table 3.5 and *Commonwealth Budget Papers*

Understanding the policy rationale for the RET

A range of rationales have been used to justify the RET. For each of these, it is clear that the RET is an indirect and costly instrument.

Table 2.4 summarises some key arguments used to justify the mandating of a renewable energy target and the subsequent working of the RET. Each of the core arguments (abatement, encouraging R&D, contributing to energy security and providing certainty) are limited as the RET provides only an indirect means of addressing them.

The weaknesses in these various arguments were recognised in the recent review of the RET. For example, the Climate Change Authority noted that:

'…the RET does not play a role in promoting energy security through reduced reliance on imported fuels' (Climate Change Authority 2012, p. 33).

It also noted:

'The Authority recognises that the RET is not a 'first best' approach to reducing greenhouse gas emissions' (Climate Change Authority 2012, p.35).

The final argument — uncertainty about the impact of more direct climate policies — leads to worries about the ability of Australia to achieve abatement at lowest cost. Using an instrument such as the RET to correct concerns about carbon pricing creates a series of additional problems

2.4 Advantages and disadvantages of the RET

Potential benefit from the RET	Advantages	Disadvantages	On balance
Encouraging abatement	The RET results in lower domestic emissions than would otherwise be the case. It encourages more domestic abatement compared with the purchase of international abatement.	The RET does not make any difference in meeting Australia's overall target, it only changes the balance between domestic abatement and purchased international abatement. Importantly, the RET is a very costly form of abatement.	The RET cannot be considered an efficient abatement measure. In a policy environment seeking to minimise the overall costs of abatement, the RET only adds costs.
Encouraging R&D	It is well recognised that a carbon price alone will not necessarily lead to the optimal amount of RD&D because there are significant risks and/or 'first mover' costs involved in investing in first of a kind low emissions technologies.	The RET is not in itself a policy that targets R&D. As an implicit production subsidy, it tends to encourage production using current technologies rather than R&D investments in new technologies.	Much of the effort to meet the RET targets involves purchase of existing technologies. The history of research into R&D policies suggests that directly targeting R&D is more likely to increase actual R&D.
Enhancing energy security	The RET provides a direct subsidy to increased utilisation of a particular renewable set of energy sources.	While the RET apparently increases diversity of energy sources, it does so at the expense of affordability, and potentially reliability.[a] Indeed, because some of the burden of the RET is borne by fossil fuel generators, the RET will not necessarily increase diversity in the long term.	One of the most important aspects of energy security is system flexibility and ability to respond to external shocks. The RET itself does not directly target flexibility.
Providing certainty	Many aspects of the future are uncertain, including future carbon prices, future energy costs, and future energy demand. The RET provides certainty to renewable producers by providing a guaranteed source of demand.	Increased certainty for renewable producers comes at the expense of consumers and other energy producers.	On balance, the RET policy contains no direct means of addressing uncertainty at the economy wide level.
Policy back up in the case of failure of the carbon price or other core policies	One of the major arguments put in favour of the RET is that is provides a backstop policy should the major policy — the carbon price or other core policies — fail at some point in the future.	As noted, the RET is not a cost effective abatement measure.	The best response to uncertainty about the carbon price or other forms of purchasing abatement should be to address those uncertainties directly, not to retain or introduce more expensive policies that are locked in for decades.

[a] **The Australian Government defines energy security as encompassing adequacy (the provision of sufficient energy to support economic and social activity), reliability (the provision of energy with minimal disruptions) and affordability (the provision of energy at a price that does not adversely impact the competitiveness of the economy and supports continued investment in the energy sector).**

Source: The Centre for International Economics

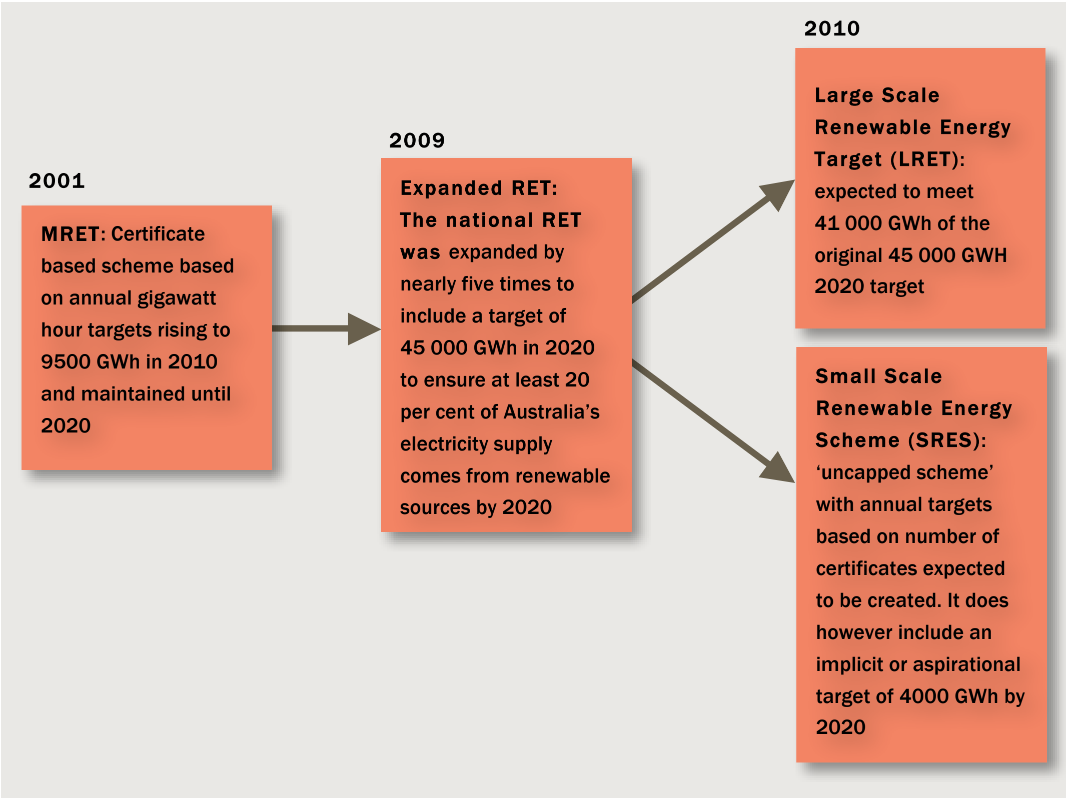
3 Some more details and cost estimates

The evolving RET

Since its introduction in 2001, the RET has seen a number of changes (chart 3.1).

- Starting as a Mandatory Renewable Energy Target (MRET) of 9,500 GWh, this was expanded in 2009 to 45,000 GWH and further modified in 2010.

3.1 Evolution of the Renewable Energy Target (RET)



Data source: The CIE

The enhanced RET scheme

In 2010, the Commonwealth Parliament passed amendments to separate the 2009 expanded RET into two parts, the Large Scale Renewable Energy Target (LRET) and the Small Scale Renewable Energy Scheme (SRES). The split was partly designed to address the problem of oversupply of renewable energy certificates (brought about after introducing solar rooftop panels into the RET) as well as to provide greater certainty to small renewable electricity producers who were unable to establish economically viable projects. Together, the LRET and the SRES form the enhanced RET and aim to support the Commonwealth Government's target of at least 20 per cent of renewable energy generation by 2020. The new enhanced RET, operating in two parts, commenced on 1 January 2011. Large-scale renewable power stations such as wind, solar and hydro-electric power stations are covered under the LRET. The LRET employs annual targets that increase each year until it reaches a target of 41,000 GWh in 2020.

The SRES covers small scale renewable energy projects such as the purchase of eligible solar water heaters, small-scale solar PV panels and small wind and micro-hydro systems. While the SRES does not have annual targets like the LRET and does not place a limit on certificate creation, it does have an implicit target of 4,000 GWh of renewable energy generation by 2020.

LRET

The LRET creates financial incentives for owners of large-scale renewable power stations like wind farms, commercial solar and geothermal by issuing them certificates known as Large Scale Generation Certificates (LGCs). These certificates, equivalent to one MWh of eligible renewable electricity generated above the power station's baseline, can then be sold to buyers (liable entities) such as wholesale electricity retailers and some generators. Liable entities have a legal obligation to buy LGCs and surrender them to the Clean Energy Regulator on an annual basis. In this way, the LRET legislates the demand for LGCs. Ultimately, the price of LGCs is determined by the demand and supply for those certificates.

The LRET specifies the amount of renewable energy to be generated by renewable energy power stations, for every year up to 2030. The annual LRET legislated target for:

- 2011 was 10,400 GWh
- 2012 was 16,763 GWh
- 2013 is 19,088 GWh.

With the exception of 2014, the annual LRET target will increase each year until 2020 after which the annual target will be 41,000 GWh. The required number of LGCs that have to be purchased by liable entities is calculated using the Renewable Power Percentage (RPP). The RPP takes into account the above annual targets, the estimated amount of electricity that will be acquired by liable entities in a given year, any under or over surrender of LGCs against annual targets of previous years and the estimated amount of all partial exemptions expected to be claimed in a given year (CER 2012).

SRES

The SRES aims to create financial incentives for households, small businesses and community groups that install eligible small-scale installations such as solar panels, solar water heaters, small-scale wind systems, heat pumps and micro hydroelectric systems. Owners of these small-scale installations are entitled to small-scale technology certificates (STCs) which, similar to LGCs, can be sold to liable entities (typically electricity retailers).

STCs can be created by eligible small-scale systems based on how much renewable electricity they produce or displace. The number of certificates a system can create depends on the amount of electricity in megawatt hours (MWh):

- deemed to be generated by the small-scale solar panel, wind or hydro system, over its lifetime (up to a maximum of 15 years), or
- displaced by the solar water heater or heat pump, over the course of its lifetime of up to 10 years (CER 2012).[1]

Owners of STCs can either exchange a financial benefit through a registered agent or sell the financial benefit through the STC Clearing House. Here, there is a government-guaranteed price of $40/STC (excluding GST). Alternatively, STCs may also be bought and sold in the open market, where the price is determined by the interaction of supply and demand for these certificates.

The number of STCs RET liable entities must purchase each year is calculated using the Small-scale Technology Percentage (STP). The STP is based on the estimated small-scale technology certificates that will be created for the year as well as the estimated amount of electricity that will be acquired by liable entities for that year (CER 2012). It also takes into account all partial exemptions expected to be claimed over the year.

When the RET scheme was first split into the SRES and LRET in 2010-11, a solar credits multiplier was introduced to encourage investment in small-scale renewable energy technologies. Owners of small-scale solar panels, small wind turbines and micro-hydro systems would be able to create more STCs than the renewable electricity (in MWh) they generated. Initially, a multiplier of 5 was available. In other words, for every MWh of electricity generated, up to 5 STCs could be created and sold. Not surprisingly, the demand for STCs exceeded expectations because of the generous nature of this multiplier. The multiplier was then reduced in 2011-12 down to 3 and again in 2012-13 to 2. This was intended to reduce the pressure on rising electricity prices. It is now at 1, indicating that there will be no multiplier. However, phasing out the multiplier does not mean owners of small-scale renewable installations will no longer receive financial support. STCs can still be created and sold and owners of solar PV systems for example can receive a payment for 15 years of renewable electricity generation, upfront.

3.2 Solar credits multiplier

Installation period	Multiplier
9 June 2009 – 30 June 2010	5 x (number of eligible STCs)
1 July 2010 - 30 June 2011	5 x (number of eligible STCs)
1 July 2011 – 30 June 2012	3 x (number of eligible STCs)
1 July 2012 – 31 December 2012	2 x (number of eligible STCs)
1 January 2012 - onwards	1 x (number of eligible STCs)*

Note: *Unless the installation is eligible for transitional arrangements

Source: Clean Energy Regulator

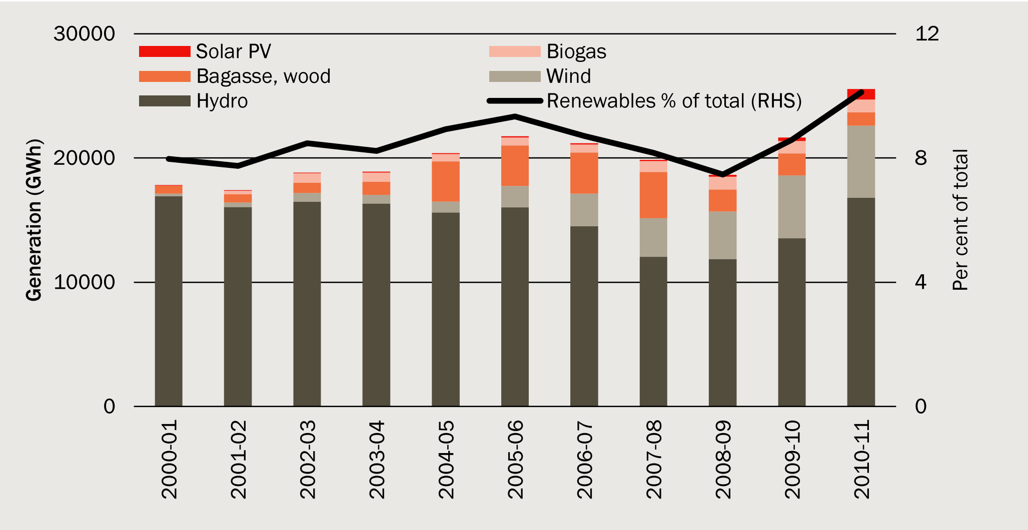
[1] This number may vary depending on geographic location, the system type, the size and capacity of the system as well as any Solar Credits eligibility.

Renewable generation

Renewable electricity accounted for around ten per cent of total electricity generation in 2010-11. Despite modest growth in absolute terms, renewable generation as a proportion of total electricity generation has not changed significantly since 2000-01, the time when the RET was first introduced. Moreover, hydro continues to dominate the mix within renewable sources, although its share has dropped from 95 per cent in 2000-01 to 66 per cent in 2010-11.

Chart 3.3 illustrates the sources of renewable generation from 2000-01 to 2010-11. Apart from modest growth in wind, bagasse and wood, there has not been any significant growth in electricity generation from other renewable sources.

3.3 Renewable electricity generation



Note: Right hand side shows renewable generation as a percentage of total electricity generation.
Data source: Bureau of Resources and Energy Economics (BREE), 2012

Cost of the RET

Because of its complex interactions with the energy market, the costs of RET must be indirectly calculated in a variety of ways. This includes the use of detailed simulation models of the electricity market. Inevitably, a variety of estimates emerge.

Cost to energy consumers

The RET's impact on consumers comes in the form of changes in retail electricity prices. As noted earlier, this depends on the net impact of the RET on wholesale prices and the cost of acquiring renewable energy certificates (which is passed onto consumers through higher retail tariffs). In jurisdictions where retail prices are regulated, the regulator determines the estimated cost impact of the RET on retailers and sets an allowable limit on RET-related costs that can be recovered through higher retail tariffs. In New South

Wales, IPART allowed for a substantial rise in the RET component of regulated tariffs in 2011-12 and 2012-13 (CCA 2012).

It is useful to understand the direct cost to electricity retailers and thus consumers from the RET. Based on certificate prices and acquittal requirements, the direct cost of the RET in 2012 was estimated to be $1,607 million (ACIL Tasman 2011). This cost is then divided by the total purchases of electricity (relevant acquisitions) made by electricity retailers as part of their RET liability to give an estimate of the cost per MWh faced by consumers. Table 3.4 outlines the various components of the direct cost of the RET.

3.4 Direct cost of the RET

	LRET/SRES	
Cost components	2011	2012
LGC price ($)	38.45	40.37
LRET target (GWh)	10,400	16,338
Direct cost ($m)	400	660
STC price ($)	40	39.02
SRES acquittals (000s)	28,000	24,277
Direct cost ($m)	1,120	947
Average certificate price ($)	39.58	39.56
Aggregate compliance volume (000s)	38,400	40,615
Direct cost of the RET ($m)	1,520	1,607

Note: Values presented are in real 2011 dollars. 'Direct cost' refers to compliance costs only and does not factor in changes in wholesale costs.

Source: ACIL Tasman analysis 2011

Although the RET is expected to moderate wholesale electricity prices to an extent, the cost reduction is considered significantly smaller than the direct cost of the scheme. Since retailers will continue to pass the cost of the RET onto consumers whenever possible, any gains from potentially lower wholesale prices is therefore likely to be limited. Based on adjusted relevant acquisitions of 189,189 GWh in 2011 and 196,389 GWh in 2012, ACIL Tasman's analysis estimates the per unit cost to un-exempted consumers as:

- $6.90/MWh under the LRET/SRES in 2011
- $7.14/MWh under the LRET/SRES in 2012 (ACIL Tasman 2011).[2]

These per unit costs translate to an additional $48 in 2011 and $50 in 2012 for a 'typical' household that consumes 7 MWh/year and does not receive any partial exemptions.

According to IPART however, the RET will add on average $102, or approximately 5 per cent, to a typical New South Wales customer's total electricity bill in 2012-13 (IPART 2012b). Importantly, this is purely the cost of complying with the RET and does not reflect changes in wholesale electricity prices.

2 Adjusted relevant acquisitions are all relevant acquisitions after any partial exemptions are subtracted. The per unit costs are calculated by dividing the total cost of the RET (direct cost plus changes in wholesale electricity costs) with adjusted relevant acquisitions. The changes in wholesale electricity costs were estimated to be -$259 in 2011 and -$245 in 2012.

IPART estimates the cost of complying with the RET by:

- estimating the cost of LGCs and STCs each year
- determining the number of LGCs and STCs retailers will be obliged to surrender each year based on the relevant RPP and STP
- calculating the cost of compliance using these decisions (IPART 2012a).

The final cost passed onto consumers by Standard Retailers also includes a retail margin that takes into account energy purchase costs, network costs and retail costs of complying with the RET as well as compensation for the time value of money. This is because retailers believe they should be compensated for the delay between incurring additional costs of their liability under the RET and the time when they recover these costs.

SKM MMA's modelling commissioned by the CCA estimated the impact of the RET on a typical Australian's annual electricity bill in 2012-13 to be $68, or approximately 4.5 per cent of their total electricity bill (CCA 2012). The Australian Energy Market Commission (AEMC) similarly looked at the cost for consumers of the enhanced RET up to 2020. According to the AEMC, the cost of the RET is forecast to comprise 3-4 per cent of the total retail electricity price over 2011-12 to 2019-20 (AEMC 2011).

3.5 Comparison of cost to consumers under the RET

	ACIL Tasman	IPART	CCA	AEMC
Annual cost of RET to consumers in 2012/13	$50	$102	$68	3-4% of total electricity price
% of total electricity bill	N/A	5%	4.5%	As above
Annual electricity consumption	7 MWh	7 MWh	7 MWh	N/A

Note: ACIL Tasman annual cost estimates are based on real 2011 dollars while IPART and CCA's estimates are believed to be in nominal terms.

Cost to industry as producers of alternative low carbon fuels

The RET, particularly the LRET, is likely to adversely impact existing non-renewable generators and producers of low carbon fuels. When a renewable target is imposed, it increases the supply of electricity in the NEM. For an upward sloping supply curve, this means a fall in the wholesale price of electricity, a process known as the merit order effect (Frontier Economics 2012). This means existing generators who are not subsidised (they do not benefit from LGC prices) or compensated under the scheme will find it harder to cover their capital costs and may obtain lower revenues. According to modelling undertaken by the AEMC, the wholesale price of electricity is forecast to be below the long run marginal cost of production up until 2030/31 if current policy settings continue (AEMC 2011). If the marginal cost of production remains above the wholesale price of electricity received by generators, there will also be little incentive to invest and develop new power stations, including gas fired plants.

It is important to note that even without the RET, wholesale electricity prices could still be depressed with the market oversupplied. While a low price affects all generators, it is baseload power that is most likely to withdraw from the market first, creating intermittency issues and increasing the average price. Reducing the RET may have a small impact on the wholesale price, but would allow demand and supply to balance better.

A few other important observations made by the AEMC include:

- under policy settings as at late June 2011, wholesale prices in the NEM will be around \$50/MWh by 2020/21 in 2010/11 dollars. In the counterfactual case, that is, where the LRET is not in place, wholesale prices are forecast to be around \$10/MWh to \$15/MWh higher by 2020/21 – in the range of \$60/MWh to \$65/MWh in 2010/11 dollars. This however may not take into account all the factors that can potentially impact the wholesale price
- wholesale prices are unlikely to return to the long run marginal cost for new base load gas plant until around 2025/26 to 2030/31. The combination of lower wholesale prices and ever changing requirements for open cycle gas plant means there may be insufficient revenues for enough profitable new gas plant to enter the market in some jurisdictions
- depressed wholesale prices could potentially undermine reliability of supply for some consumers
- the total compliance cost of the enhanced RET is expected to increase from \$1.78 billion in 2010/11 dollars to \$2.20 billion in 2019/20 in 2010/11 dollars, if current policy settings continue
- the contribution of the SRES and the LRET to total costs is expected to change over time. The LRET is expected to comprise around 74 per cent of total RET costs over the outlook period 2011/12 to 2019/20 while the cost impact of the SRES is expected to decline significantly after 2012/13 as uptake falls
- some consumers may not receive the full benefit of lower wholesale prices as the LRET creates a wedge between wholesale prices and the retail prices paid by consumers. Consumers end up paying the cost of LGCs and STCs through higher retail prices, to fund the additional revenue source for renewable generators (AEMC 2011).

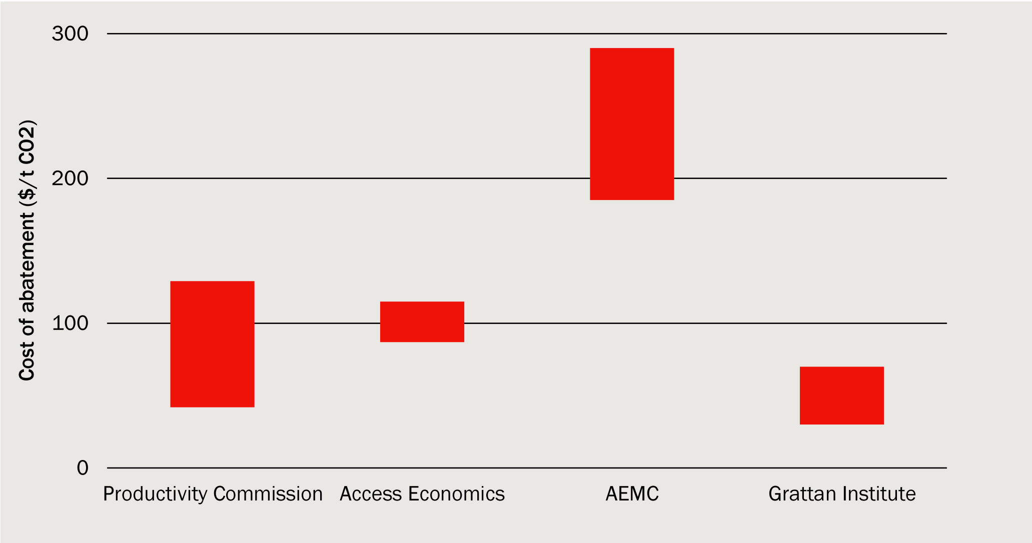
Cost of abatement under the RET

Essentially, the cost of abatement under the RET scheme is equal to the resource cost of producing renewable generation capacity per unit of abatement induced by the scheme. Both of these elements are uncertain:

- the resource cost of producing renewable generation will be related to the RET certificate price, but will not necessarily be precisely reflected in that price. Other factors (including direct subsidies to some renewable production, including feed-in tariffs) mean that the resource cost may diverge from the certificate price
- the abatement induced by the scheme can be measured as the emissions avoided from the alternative generation that is displaced by the new renewable generation. The avoided emissions clearly depend on what form of generation is replaced by the renewables. It is not necessarily the case that the most emissions intensive generation is replaced.

Several recent reports have estimated the costs of abatement under the RET scheme. Chart 3.6 summarises the overall range for the total RET scheme while table 3.7 provides more details of each of the calculations. While the methodologies used across the estimates vary slightly, they all to indicate a high cost of abatement under the overall RET scheme, the LRET and particularly the SRES.

3.6Ranges for the cost of abatement under the overall RET scheme



Data source: See table 3.5

3.7 Comparison of the cost of abatement under the RET

	Productivity Commission (2011)	Access Economics (2011)	AEMC (2011)	Grattan Institute (2011)
Measure of cost of abatement	Implicit abatement subsidy[3]	Cost of purchasing RECs divided by total emissions abatement achieved	Cost relative to change in emissions[4]	Cost of complying with scheme relative to abatement achieved
Relevant year(s)	2009-10	2020	2011-2020[5]	2010
Cost/subsidy equivalent under LRET scheme (A$m)	283-459	n/a	320-495	
Abatement under LRET	4.1-7.6 Mt CO_2	n/a	4.0-9.0 Mt CO2-e	8.6 Mt CO_2-e
LRET cost of abatement ($/t CO_2)	37-111	n/a	55-80	
Cost/subsidy equivalent under SRES scheme (A$m)	52-98	n/a	50-750	
Abatement under SRES	0.2-0.3 Mt CO_2	n/a	0.1-2.5 Mt CO_2-e	0.2 Mt CO_2-e
SRES cost of abatement ($/t CO_2)	152-525	n/a	300-500	
Cost/subsidy equivalent under overall RET (A$m)	335-556	3,944-3,982[6]	n/a	
Abatement under RET	4.3-8.0 Mt CO_2	34.6- 45.3 Mt CO_2-e	4.1-11.5 Mt CO_2-e	8.8 Mt CO_2-e
Overall RET cost of abatement ($/t CO_2)	42-129	87-115	185-290[7]	30-70

Source: As shown in column headings

A number of important points emerge from these comparisons:

- the overall RET cost of abatement ranges from $30 to $290 per tonne of CO_2
- the cost of the LRET is lower, ranging from $37 to $111 per tonne of CO_2
- the cost of the SRES is considerably higher, ranging from $152 to $525 per tonne of CO_2

3 The implicit abatement subsidy is a measure of the cost effectiveness of an abatement option. It is calculated by dividing the subsidy equivalent by the abatement induced. The subsidy equivalent measures the outlays required to pay for certain amounts of abatement from particular sources and is therefore an 'upper-bound proxy' for the resource cost of a policy scheme.

4 The AEMC estimated the cost of abatement by calculating the additional annualised operating and capital costs relative to the counter factual divided by the change in emissions.

5 The cost of the schemes, the abatement achieved and the cost of abatement in terms of dollars per tonne are estimates for a given year (not cumulative) and therefore a range has been included to reflect differences over the years. All estimates are in 2010/11 dollars.

6 Refers to the REC liability under the RET scheme on its own ($3,944m) as well as the REC liability under the RET scheme together with a carbon price ($3,982m).

7 Refers to the average cost per t/CO_2 for the overall enhanced RET scheme, where the average cost by 2020 is estimated to be $185. The CIE estimated that the average abatement cost in 2010/11 was approximately $290 based on AEMC data.

- each of these costs is higher than either the current or expected carbon price. The presence of the RET therefore raises the cost of abatement to the Australian economy as a whole.

Looking at the individual studies:

- Access Economics report on the impact of climate change policies estimates that abatement cost under the RET is approximately $87-115/t CO_2-e at 2020
- The Productivity Commission also evaluated the 'effective' carbon price or the cost of reducing greenhouse gas emissions of different carbon emission policies. The commission estimated that the cost of abatement under the RET scheme was in the range of $42-$129 in 2009 and 2010. Although the study does not explicitly estimate the cost of the LRET and the SRES, it does measure the cost of abatement under the large-scale and small-scale component of the RET as it existed in 2010
- The relatively lower cost of abatement estimated by the Grattan Institute is based on certificate prices. The cost per tonne of CO_2-e abated has ranged from $30-$40/t CO_2-e when certificate prices have been low (reached as low as $15 near 2007) to around $70/t CO2-e when certificate prices have been high (reached a peak of $50 in 2008/09). The price of certificates collapsed by 2005 when the scheme was substantially over supplied with renewable energy and revived soon after 2007 when policy commitments were made to expand the target (Grattan Institute 2011)
- The cost of abatement for the overall RET scheme estimated by the Australian Energy Market Commission (AEMC) is significantly higher than other estimates. Importantly, the cost of abatement under the LRET estimated by the AEMC is in a similar range to that evaluated by the Productivity Commission, despite the use of entirely different approaches. However, as the AEMC takes an average of the abatement cost under the LRET and the SRES to estimate the cost of abatement under the overall enhanced RET, it is obvious that the SRES component of the RET is driving up abatement costs significantly
- As AEMC note, estimating the cost of abatement under the SRES or other policies such as jurisdictional FiTs which support solar PV installations is difficult as it is not possible to entirely disaggregate the abatement or the cost that should be attributed to one particular policy. For this reason, the costs of abatement under the SRES have been based on the costs of abatement from solar PV installations, which reflect the cost premium borne by the economy as a whole when replacing solar PV with grid-based electricity (AEMC 2011). In this way, the cost of abatement is measured by the economic resource cost of PV installations divided by the abatement these installations manage to achieve. The costs range from around $500/ tonne CO_2-e in 2010-11 to around $300/ tonne CO_2-e in 2019-20, highlighting that solar PV offers a relatively expensive means of achieving abatement. The high cost associated with the SRES therefore translates to a relatively high average cost of abatement under the overall enhanced RET scheme.

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