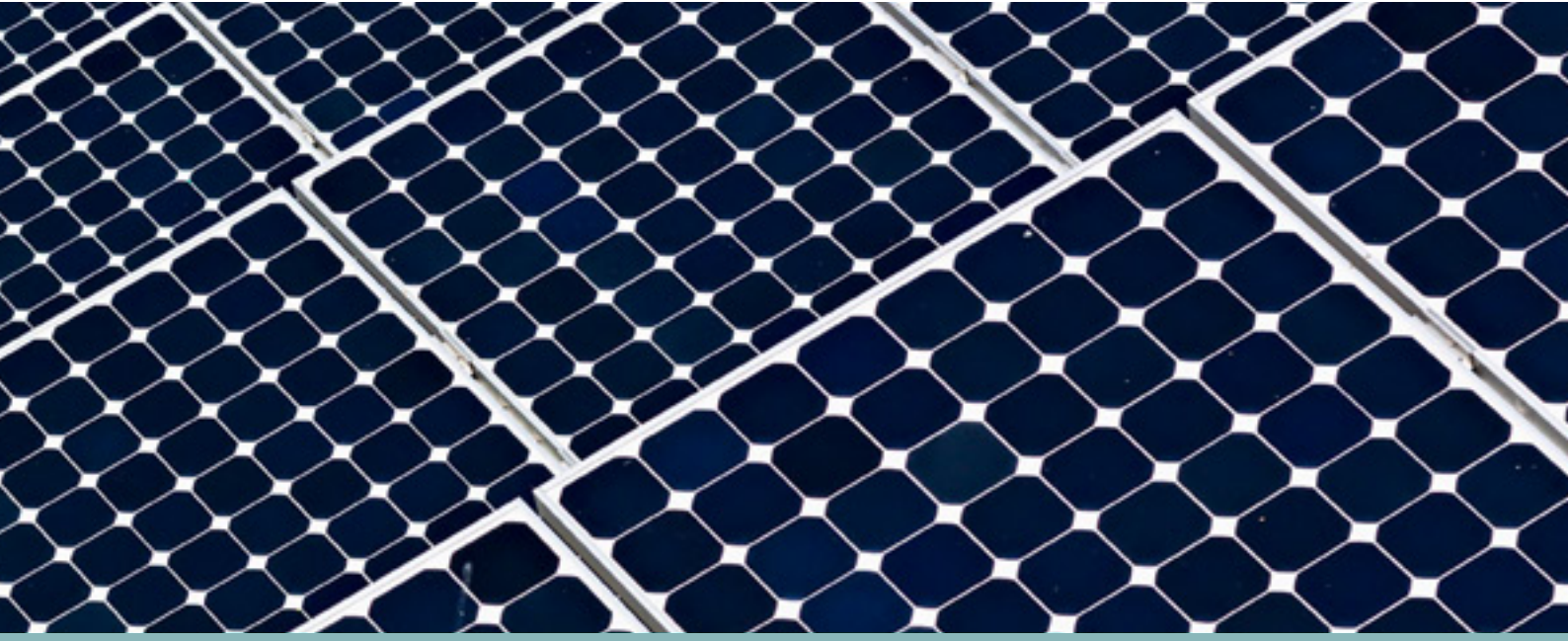

FIGHTING DIRTY ON CLEAN ENERGY: **THE CASE FOR THE RENEWABLE ENERGY TARGET**

JULY 2014

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The Australia Institute
Research that matters.

Fighting dirty on clean energy

The case for the Renewable Energy Target

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TAI

Policy Brief

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Summary

Australians love renewable energy. A recent survey by The Australia Institute found 86 per cent of respondents want to see more renewable energy and 79 per cent think governments should support an expansion in renewable energy. There is also very strong support for more electricity generated from hydro (72 per cent), wind (80 per cent) and solar (90 per cent). By comparison, only 11 per cent wanted more electricity generated from coal.

The Renewable Energy Target (RET) is an important driver of renewable energy production. Seventy-one per cent of Australians support the RET. Sixty-eight per cent agreed with its 20 per cent target or thought it should be higher, with only 11 per cent thinking it should be lower.

The federal government has tried to blame rising electricity prices on the RET. But while electricity prices have doubled in the last six years, the RET has played very little part in this – previous reviews and modelling have shown only a three to four and a half per cent rise in electricity prices attributable to the RET.

In fact, a growing number of studies are showing that the RET is likely to put downward pressure on wholesale electricity prices and that this will flow through to retail prices, eventually providing relief to consumers. Among these studies are the preliminary results from the government's own modelling for the RET review. By 2020, the RET is likely to be decreasing electricity prices not increasing them.

Electricity production makes up about a third of Australia's greenhouse gas emissions. Any attempt to significantly reduce our emissions will require a corresponding change to how we produce electricity.

The RET has been very successful in reducing emissions. Since its creation in 2001 it has reduced emissions by 22.5 million tonnes of carbon dioxide equivalent (CO_2e). The only government policy to have reduced Australia's emissions more has been the carbon price. If the RET is left unchanged it is predicted to reduce emissions by an additional 76 million tonnes of CO_2e by 2020. This would mean that the RET by itself will have taken Australia a sixth of the way towards the five per cent reduction target.

Ninety per cent of additional renewable energy generation in the period since its inception has been attributable to the RET – it doubled Australia's renewable energy capacity in the period between 2001 and 2012. It provided the incentive for investments totalling more than $5 billion in renewable energy in 2011 alone.

The success of the RET, combined with falling demand for electricity, has put pressure on coal-fired power stations. This has led to calls from fossil-fuel generators to water down or abolish the RET entirely. The doubling of electricity prices has made the general public more sensitive to anything that might affect their power bills. Fossil-fuel generators and the government have been quick to try and link the RET to these electricity price rises.

The government has commissioned a separate review of the RET, which is to be led by self-confessed climate sceptic Dick Warburton. The terms of reference for the review are heavily focused on the price impacts of the RET and its effect on the cost of living. The scope of the review does not talk about reducing emissions – the primary purpose of the RET. The economic modelling for the review, which will help determine the impacts of the RET, will not include many of the benefits of renewable energy, such as health, jobs and network improvements.

Despite the unusual methods being used to model the RET, preliminary results released by the modellers has shown that the RET will cause electricity prices to fall. This is consistent with results obtained by other leading energy modellers.

Emissions from electricity generation have been falling in recent years because of an increase in renewable and gas generation, combined with falling electricity demand. This may change soon, with wholesale gas prices rising rapidly and gas-fired generation becoming less viable. Gas-generated electricity will need to be replaced with other forms of power generation. If the RET is watered down or abolished it is more likely that waning gas-generated electricity will be replaced by coal-fired electricity, which will increase carbon emissions from electricity production.

Introduction

The aim of the Renewable Energy Target (RET) is to increase the level of renewable energy generation in Australia and reduce greenhouse gas emissions from Australia's electricity production. The federal government is currently reviewing the RET and its recommendations could have a significant effect on renewable energy production for many years to come. This paper is designed to demystify the RET, look at what it has achieved and what it is capable of achieving, and to consider the challenges it faces in the near future.

The panel appointed by the government to review the RET is led by Dick Warburton, a self-declared climate change sceptic. In the lead up to the announcement of the review, the Prime Minster linked the effectiveness of the RET to its impact on electricity prices, saying, "the renewable energy target is causing pretty significant price pressure in the system".[1]

Electricity prices have doubled in the last six years and, as a result, people have become sensitive to the price of electricity. But the doubling of electricity has little to do with the RET, which has only been responsible for increasing prices by between three and four and half per cent. An overwhelming proportion of the increase in prices has been because of an increase in network costs – the so-called poles and wires.

The RET has also been responsible for reducing Australia's emissions by 22.5 million tonnes of carbon dioxide equivalent (CO_2e). In its current form the RET is predicted to reduce emissions by 76 million tonnes of CO_2e by 2020, or about a sixth of the emissions reduction required to meet the five per cent target by 2020.

The RET is especially important at the moment. Gas prices are rising rapidly towards the export parity price, with the construction of large export facilities in Gladstone, Queensland. The new higher gas prices will see a lot of gas-fired electricity become unviable – but without a robust RET, much of it could be substituted for more emissions-intensive coal-fired power generation.

A survey of support for renewable energy conducted for The Australia Institute found that 86 per cent of respondents wanted more renewables in the future, with only three per cent wanting less. Seventy-nine per cent of respondents were also in favour of government support for an expansion of renewable energy with 71 per cent in favour of the RET. Sixty-eight per cent agreed with the 20 per cent target or thought it should be higher, with only 11 per cent thinking it should be lower. There was also very strong support for more electricity generated from hydro (72 per cent), wind (80 per cent) and solar (90 per cent). In comparison, only 11 per cent wanted more electricity generated from coal.

With the review of the RET underway and the government showing signs of wanting to water it down or abolish it, it is important to understand the impact the RET has had on Australia's emissions and electricity prices. It is also important to put into context the important role the RET is likely to play in reducing Australia's emissions into the future.

What is the RET?

The RET is a government scheme that is designed to increase the amount of electricity produced using renewable sources and in so doing reduce Australia's greenhouse gas emissions. It was first put in place in by the Howard government in 2001. The Howard government RET mandated an additional 9,500 GWh of renewable energy (two per cent) by 2010. The target was expanded in 2009 to an additional 45,000 GWh (20 per cent) by 2020. This was later split into the large-scale renewable energy target (LRET), which includes large

[1] Edis (2013) *Old Abbott and Newman's RET confusion*.

producers of renewable energy and the small-scale renewable energy scheme (SRES), which includes things like household rooftop solar and solar hot water systems. The LRET was mandated to produce 41,000 GWh by 2020 while the SRES was nominally assigned the remaining 4,000 GWh.

The way the RET works is by requiring that those who sell electricity to consumers – electricity retailers – must buy a certain amount of electricity from renewable sources, which is then on-sold to consumers. The amount they have to buy increases each year until it reaches the RET target in 2020.

Under the RET, renewable energy producers create a renewable energy certificate (REC) for every MWh of energy they produce. These RECs are what electricity retailers have to buy to show that they have bought enough renewable energy each year. So, in 2020, the RET will mandate that electricity retailers have to buy 41,000 GWh of renewable electricity. Since one GWh is the same as 1,000 MWh, that means that in 2020 retailers will need to buy 41 million MWh of renewable energy. In 2020, therefore, 41 million RECs will be created by renewable energy producers and bought by electricity retailers.

RECs are the way that the government makes sure that the mandated amount of renewable energy is produced. If the government increased the number of RECs retailers were compelled to buy, this would increase the amount of renewable energy. If the government decreased the number of RECs retailers had to buy, this would decrease the amount of renewable energy produced.

RECs are bought and sold in a market. If there is a lot of renewable energy being produced, or the cost of producing renewable energy goes down, then the price of RECs that retailers have to buy will go down. If, on the other hand, there is a shortage of renewable energy or the cost of producing renewable energy goes up, the price of RECs goes up. Because renewable energy producers create a REC for every MWh of electricity they produce, the higher the REC price, the more money they make selling their electricity. A high REC price therefore encourages the production of more renewable electricity. So if an impending shortage of RECs arises then the higher price will encourage the generation of more renewable energy.

Why do we need a RET?

The RET is part of a strategy to reduce greenhouse gas emissions produced by the generation of electricity. Electricity production makes up about a third of Australia's greenhouse gas emissions and any attempt to significantly reduce Australia's emissions will require significant change to how Australia produces electricity.

At the moment coal is the main fuel for generating electricity in Australia. According to the Bureau of Resource and Energy Economics, coal makes up about 70 per cent of electricity generation, with gas making up about 20 per cent and renewables making up about 10 per cent.[2] Coal is one of the most emissions-intensive forms of electricity generation and brown coal, which makes up about 20 per cent of Australia's electricity generation, is the worst form of coal. If Australia is to substantially reduce its emissions, it will need to replace coal with renewables in its generation of electricity.

According to the Carbon Emissions Index, or CEDEX, this is what is happening – since 2006, the amount of electricity generated from black coal has fallen by about 20 TWhs and the amount of electricity generated from brown coal has decreased by about five TWhs. At the

[2] BREE (2013) 2013 Australian Energy Update.

same time, the amount of electricity generated from renewable sources has increased by about 10 TWhs.

Why are we reviewing the RET?

The RET legislation calls for biennial reviews of the RET to be conducted by the climate change authority (CCA). The next review of the RET is due to be completed by the end of 2014. This review has been subject to some controversy, as the government plans to disband the CCA – which under the legislation is charged with conducting the review. The legislation required to disband the CCA is currently stuck in the Senate. The CCA is therefore legally obligated to review the RET, but the government has chosen to ignore the CCA and conduct its own review.

The government has stirred further controversy around the appointment of people to its review panel. Dick Warburton – a self-confessed climate sceptic – will lead the panel. Given that the purpose of the RET is to reduce Australia's greenhouse gas emissions in order to combat climate change, it might seem strange that the head of the review team disputes the existence of the very problem the RET is helping to solve.

The government has also announced that its review will include economic modelling to help determine the impacts of the RET – this is consistent with the previous review of the RET in 2012. The assumptions behind the modelling are curious, however, as they will mean that many of the benefits of renewable energy – such as health, job and network improvements – will not be included. It was claimed that they were too hard to model. The selection of ACIL Allen as the modeller was also surprising, given its perceived links to fossil fuel interests. The modelling done on behalf of the coal industry for the 2012 review of the RET was also rejected by the CCA.

The terms of reference for the government's – as opposed to the CCA's – review of the RET are heavily focused on the price impacts of the RET and its effect on the cost of living. The scope of the review does not talk about reducing emissions, which is the primary purpose of the RET. The unusual way in which the government's RET review is being conducted has the potential to skew the results of the review away from the core purpose of the RET.

Despite this, preliminary results released by the modellers have shown that the RET will cause electricity prices to fall. This is consistent with results obtained by other leading energy modellers. This will be discussed in more detail later in the paper.

Has the RET increased the amount of renewable energy?

The RET has been responsible for the building of lots of new renewable energy projects. It has doubled Australia's renewable energy capacity in the period between 2001 and 2012. This has meant that investment spent on renewable energy has increased from almost nothing in 2001 to over $5 billion in 2011. This high level of investment has expanded Australia's capacity to generate renewable energy, almost doubling it from 2001 to 2012 from 10,650 MWs to 19,700 MWs. This has led to the RET producing 14,000 GWh in 2011 and creating 160 million certificates from 2001 to 2011.

What effect has the RET had on electricity prices?

Household electricity prices have doubled since 2008.[3] As a result, electricity bills have largely replaced petrol prices as the new political sensitivity. Politicians who are keen to

[3] ABS (2014) *6401.0 – Consumer Price* Index Table 7 Dec 2007 to Dec 2013.

promote their credentials as people who understand the average voter's perceived 'cost of living pressures' have been keen to be vocal about the need to do something.

The reasons for the doubling of household electricity prices are varied and complex. Despite this, most participants in the political debate over electricity have tended to pick one reason for the price rises and repeat that reason alone. Many blame the carbon price, others the 'gold plating' of the electricity network. Most recently, political focus has shifted to the Renewable Energy Target (RET). While all these factors have had some impact on electricity prices, none of them alone, nor indeed these three combined, have had a sufficient impact to explain why electricity prices have doubled.

The political focus on the RET is particularly curious, since of all the alleged reasons for rising electricity prices, it has probably had the smallest impact. The RET has probably increased retail electricity prices by between three and four and half per cent[4], which is a small fraction of recent increases.

More important causes of electricity price rises

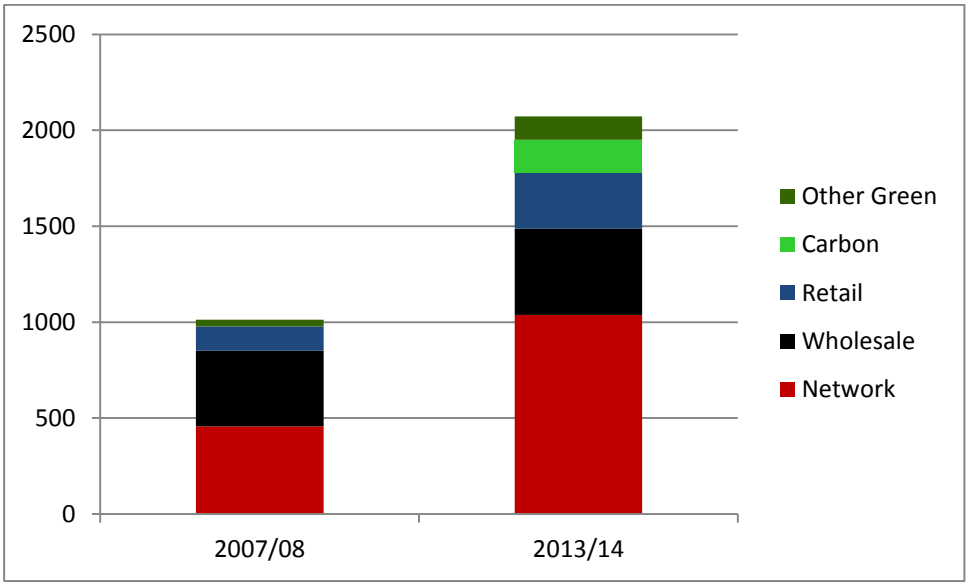
The doubling of retail electricity prices has been caused by a number of factors that have simultaneously put upward pressure on prices. Most of these factors have increased network costs, the so-called poles and wires. This has included a period of large investment in electricity networks, changes to reliability standards, gold plating of the network and increases in peak demand.[5]

Figure 1 shows NSW electricity price data over the period that electricity prices have doubled, from 2007-08 to 2013-14. It shows the cost of an average household's electricity bill, which has increased from $1,013 per year to $2,073 per year. It also shows where the price increases have come from. While retail costs, other green initiatives and the carbon price have increased electricity bills to a degree, the vast majority of the increase has come from network costs. In fact, network costs now cost the average NSW household $1,038 per annum, which is slightly more than their total bill in 2007-08. They account for more than 50 per cent of the price increase.

[4] Climate Change Authority (2012) *Renewable Energy Target Review*.

[5] Garnaut (2011) *Update Paper 8: Transforming the electricity sector*.

Figure 1: Causes of electricity price increases from 2007-08 to 2013-14



Source: IPART

This increase has been caused by a number of factors including investment in the network, reliability standards, peak demand and gold plating.

Investment in the network

There was substantial investment in electricity networks after World War Two as the electricity network was expanded in an attempt to connect all Australian homes. This investment period ran through the 1950s and 60s. After that, investment in electricity networks declined and by the late 1990s the network was ageing and suffering after decades of under-investment.

After a number of large blackouts in Queensland and New South Wales that caused a voter backlash, state governments commissioned reports that showed the network needed substantial levels of funding. Regulations were introduced in 2006 and 2007 to encourage state-owned statutory bodies and private owners that had responsibility for the electricity networks to increase investment.[6] This included giving the statutory bodies a guaranteed return on investment by allowing them to increase prices to recoup their investment, plus a set rate of return.

These regulatory changes had the desired effect. There was a substantial increase in network investment – $40 billion is being spent over a five-year period in Australia on electricity distribution and networks.[7] This was also the genesis for what would later become claims of gold plating, which will be discussed below in more detail. The increase in investment in infrastructure was then recouped in higher prices.

[6] Australian Energy Regulator (2011) *Economic regulation of transmission and distribution network service providers*.

[7] Institute for Sustainable Futures (2013) *Investing in savings: Finance and cooperative approaches to electricity demand management*.

Reliability standards

At a similar time, various state governments were introducing new and stricter reliability standards. This meant that network providers had to build in more capacity as backup in case there were failures in parts of the network. This added to the amount of new capital investment that was being spent on upgrading the network and also added to the price of electricity.

Peak demand

An increase in peak demand – caused primarily by the popularity of household air conditioning – added to the cost burden of these investments. Air conditioners, when compared to other household appliances, use a relatively large amount of electricity when in full use. It has been estimated that for each additional air conditioner that is plugged in, $7,000 is required in network upgrades to guarantee electricity supply on the most extreme hot summer day. These upgrades are then recouped in higher electricity prices.

Gold plating

The final significant factor in this perfect storm of increasing electricity network costs was the problem of gold plating. The change to regulations meant that electricity network providers made a guaranteed return on investment, at a commercial rate of return. The government owners of networks were able to borrow at lower state-government rates and then invest into the electricity network and earn a commercial rate of return. This effectively meant that state governments could earn money by upgrading the electricity network.

This encouraged network owners to invest heavily in upgrading the network – the more money that was spent on the network, the larger the financial return to the state government. It also meant that electricity prices continued to rise. It has been claimed that because of the returns on offer, owners of electricity networks have invested in projects whose value to the network is dubious. This practice became known as gold plating. A Senate Enquiry in 2012 found that the most significant reason for electricity price rises was inefficient over-investment in network infrastructure.[8]

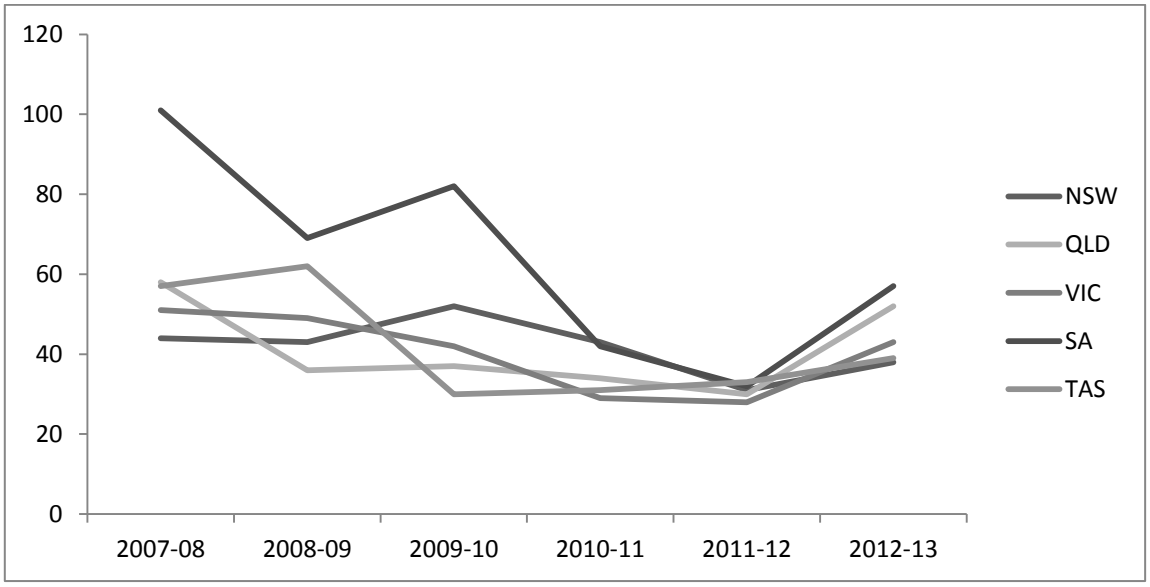
Wholesale prices

While the RET's effect on prices paid by consumers is limited, under some circumstances it may in fact put downward pressure on electricity prices. While the cost of distributing electricity has increased dramatically, the wholesale price of electricity – that is, the price that generators receive – has been falling apart from a large increase in 2012-13 because of the carbon price. As Figure 1 above shows, in NSW the share going to wholesale of the average electricity price shrank from 39 per cent to 22 per cent in the face of rising network costs. Over the six years it only increased by $55.

Figure 2 shows changes in wholesale electricity prices exclusive of the carbon price for National Electricity Market (NEM) states.

[8] APH (2012) *Reducing energy bills and improving efficiency*.

Figure 2: Annual volume weighted spot prices in the NEM ($/MWh)



Source: Australian Energy Regulator (2013) State of the Energy Market 2013. Note 2012-13 has been adjusted by the AER to remove the effect of the carbon price

As Figure 2 shows, wholesale electricity prices have been trending down. This might be considered strange, since the RET affects wholesale prices – renewable electricity producers sell electricity into the wholesale market. It might be expected that wholesale prices would increase rather than decrease.

An important aspect of wholesale electricity prices is that they change day-to-day, hour-to-hour and even minute-to-minute. While the retail electricity suppliers that deal with household consumers buy electricity at all sorts of different prices, they generally sell it to households at a fixed price. This fixed price is influenced by the average wholesale price of electricity, in addition to other factors.

The wholesale price of electricity is determined in a market by the supply and demand of electricity. Increases in demand at certain times of the day can cause electricity prices to increase dramatically. With the increase in household use of air conditioners, these times are increasingly on very hot days. On these days prices can increase so much that some electricity suppliers have (mainly gas) generators that sit idle for most of the time that they only switch on to take advantage of these price spikes.

Some researchers estimate that 25 per cent of the cost of electricity to retailers occurs over a period of less than 40 hours of peak demand per year.[9] This puts into sharp focus how much the average cost of generation is dependent on only a short amount of time each year.

Renewable energy is variable and tends to produce significantly more electricity at these peak times. Solar in particular has higher output on hot summer days. The increase in renewable energy has the potential to put downward pressure on wholesale electricity prices at these peak times. This then has a downward effect on average wholesale electricity prices, which can then flow through as downward pressure on retail electricity prices.

This effect can be seen in Germany, which over the last four years has installed 25 GWs of solar PV. The following two figures show the wholesale price of electricity on a typical March

[9] Manning et al. (2012) *High power rates: it's a poles and wires story*.

day. The first is in 2008 and the second is in 2012, after the 25 GWs of solar PV have been installed.

Figure 3: German electricity demand 2008

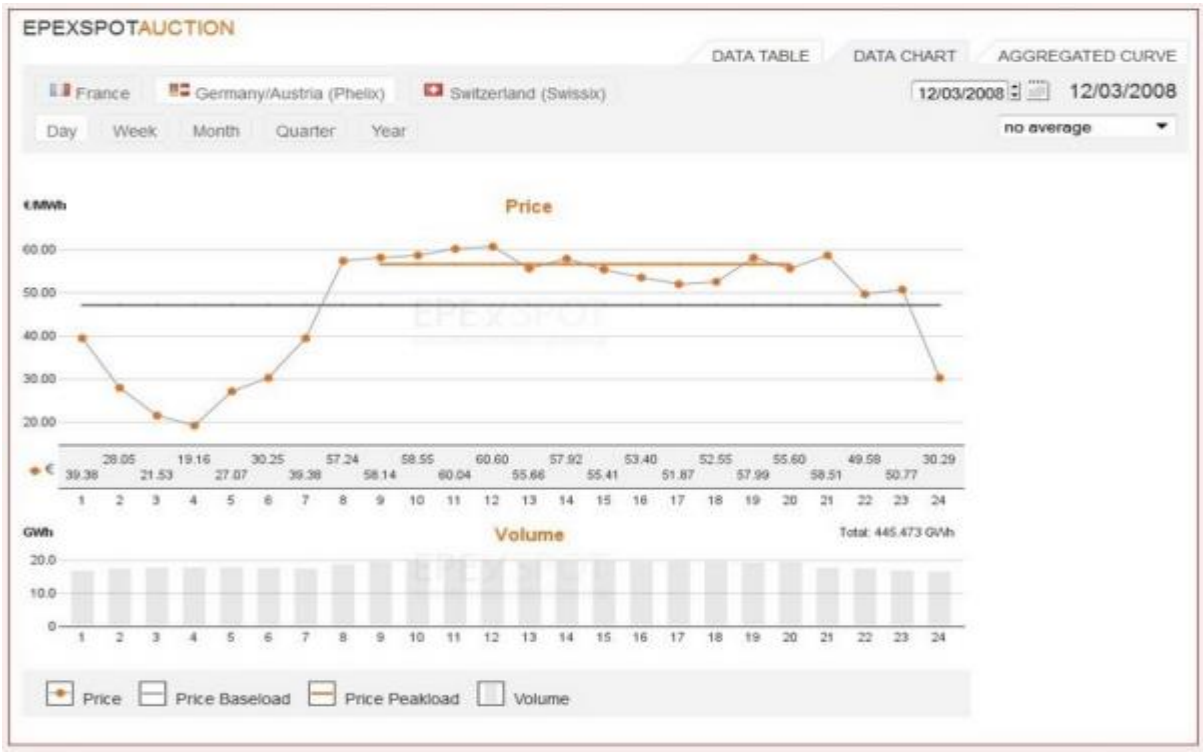


Figure 4: German electricity demand 2012

The price in 2012 (Figure 4) is significantly lower than the price in 2008 (Figure 3) during the day, when the solar PV is generating electricity. During these times the increased supply of electricity is pushing down the wholesale price. It does so to the extent that both the peak load price and the base load price of electricity are lower. This is the effect that renewable energy can have on wholesale prices. The pushing down of wholesale prices in turn pushes down retail prices, which are made up in part by wholesale prices.

In June 2013, University of Melbourne researchers modelled the effect on wholesale electricity prices in 2009 and 2010 if there had been 5,000 megawatts of solar photovoltaic (PV) .[10] The paper found that wholesale electricity prices would have fallen. This is consistent with what is being observed in Germany.

In South Australia, where wind energy makes up a significant proportion of total generation, representing 24 per cent of capacity, the Australian Energy Regulator (AER) has found that wind has a moderating effect on wholesale electricity prices.[11]

Modelling recently released by one of Australia's leading economic modellers concludes that removing the RET would increase electricity prices by 2020. Two other leading energy market modellers, SKM-MMA and Intelligent Energy Systems have come to similar conclusions.[12] So while the RET may have increased retail electricity prices by three to four and half per cent, it is also having the opposite effect on wholesale electricity prices. The modelling suggests that, within a few years, this downward pressure on wholesale prices will be greater than its upward pressure on retail prices – meaning the RET will actually be decreasing electricity prices.

Preliminary results from modelling commissioned by the government for its review of the RET has also found that the RET puts downward pressure on wholesale electricity prices. It is also in agreement with the other energy modellers that this downward pressure will cause electricity prices to be lower because of the RET in the near future.

Put into proper perspective, the RET is having a relatively small effect on electricity prices and even that small impact is likely to be partially offset by reducing peak wholesale electricity prices and will be fully offset in coming years. While there is considerable public concern about electricity prices, because they have doubled over the last six years, dismantling or watering down the RET will not provide the desired electricity price relief. Indeed it may ultimately lead to higher electricity prices.

Political reaction

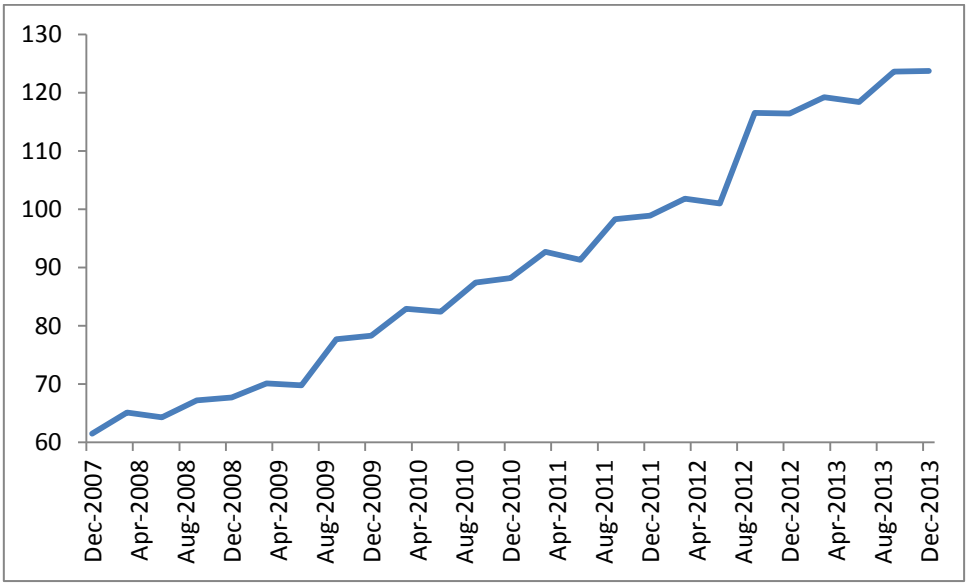
The increase in price has focused consumers' attention on the cost of electricity. As Figure 5 shows, from the end of 2007 to the end of 2013 retail electricity prices doubled. This interest from households has made electricity prices a touchy political subject. We have seen both major parties make claims that cost of living pressures, caused by the increase in electricity prices were causing significant pain in the community.

[10] McConnell et al. (2013) *Retrospective modeling of the merit-order effect on wholesale electricity prices from distributed photovoltaic generation in the Australian National Electricity Market*.

[11] Australian Energy Market Regulator (2012) *State of the Electricity Market: Chapter 1 National Electricity Market*.

[12] Edis T (2014) *Fighting off a gas price spike*.

Figure 5: Electricity price changes (Weighted average of eight capital cities)



Source: ABS (2014) Consumer Price Index

While there is no doubt that electricity price rises caused some financial distress to some families, particularly those on lower incomes, overall cost of living has grown slower than incomes, meaning people's disposable income has been rising. The National Centre for Social and Economic Modelling (NATSEM) did research that compared household income versus expenditure on household items and found that, on average, Australians' disposable income increased by 20 per cent in the previous 27 years. A family is better off in real terms by $224 per week.[13]

Political action on electricity prices was also limited, since the major causes of the price rises were not easily prevented. Some changes have been made to reliability standards and regulations have been altered to make gold plating harder. But the central issue – needing to upgrade the network – has been legitimate, and for the most part has already been achieved.

In an effort to show action on electricity prices, the politicians have blamed the price rises on politically convenient, but ultimately minor factors. This has primarily centred on the carbon price, but in more recent times has also included the RET. The carbon price has been responsible for an increase in retail electricity prices of about nine per cent and the RET has increased retail electricity price by about three to four and half per cent. In the context of a doubling of electricity prices, these increases caused by the carbon price and the RET have been relatively minor.

Gas and the RET

The effect of changes in the structure of the Australian eastern gas market could mean that recent falls in emissions from the electricity sector will be reversed. Changes to the RET could have a significant impact on this. The abolition or watering down of the RET could cause larger and more long-term increases in electricity emissions, while a strengthening of the RET could prevent some or all of the increase in emissions.

The Australian eastern gas market is about to be opened up to the world market and this means gas prices are on the rise. Large LNG export facilities are being constructed in

[13] Phillips et al. (2012) *Prices These Days: The Cost of Living in Australia*.

Gladstone in Queensland. When complete, they will drive the wholesale gas price up from recent prices of $3 to $4 a gigajoule to $8 to $10 a gigajoule. This represents a doubling or tripling of wholesale gas prices.

There have been warnings from large industrial users about the consequences that such big gas price rises will have on gas-dependent manufacturing firms.[14] There has been less focus on the impact on electricity generation. The increase in gas prices is likely to make gas-fired power stations uncompetitive. At the moment, gas-fired electricity generation represents 20 per cent of capacity in the National Energy Market (NEM) and 12 per cent of output[15].

As this generation capacity becomes uneconomic, it will need to be replaced by other sources. This is important in the context of the RET. In the absence of strong support for renewable energy, the likely replacement for gas-fired electricity will be coal.

This has already begun to happen, with the announcement that the Swanbank gas-fired power station will shut down because it is more profitable to on-sell the gas rather than burn it to generate electricity. Owned by the Queensland government, Swanbank's gas generation will be replaced by the currently mothballed Tarong coal-fired power station.[16]

The switch from gas to coal will increase Australia's greenhouse gas emissions. Coal-fired power produces significantly more emissions than gas. This switch will make it harder for Australia to reach its emissions reduction target, particularly since the electricity sector has seen falling emissions for the last four years.

Demand for electricity has been falling in Australia since 2010. Fossil fuel generators have been feeling the squeeze due to this decline in demand combined with increased electricity generated from renewable sources. This has led to a number of coal-fired power stations being mothballed – that is, shut down, but left in case they are required at a future date. These mothballed coal-fired power stations are the most likely replacements for gas-powered generators.

It is likely that a significant proportion of current gas-fired electricity generation will become unviable. This creates the space for a large expansion in renewable energy. The decline in gas-fired electricity could create an opportunity to strengthen the RET rather than water it down.

Another way the government could help renewables fill the gap in generation is with its proposed emissions reduction fund (ERF). This is the centrepiece of its Direct Action Plan and involves the government buying emissions reductions from companies able to provide them. The ERF could be used to fund new renewable projects. These projects would reduce Australia's emissions, because they would prevent the switch from lower-emitting gas generation to higher-emitting coal-fired generation.

It appears, however, that the government will go in the opposite direction. The repeal of the carbon price will mean that coal-fired generators are not paying all the costs associated with their production. This will make renewables relatively more expensive when compared to coal. If the government, in addition to this, waters down or scraps the RET on top of repealing the carbon price, then the likely outcome is an increase in coal-fired generation. This will make reducing Australia's emissions more difficult.

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[14] Manufacturing Australia (2013) *Impact of gas shortage on Australian manufacturing*.

[15] Australian Energy Market Regulator (2013) *State of the Electricity Market: Chapter 1 National Electricity Market*

[16] Moore (2014) *Swanbank power station to close for three years*.

The rise in gas prices because of the linking of the eastern gas market with the world market marks an opportunity to reduce Australia's emissions. It also carries risks that Australia will revert to more emissions-intensive forms of electricity generation. The rise in gas prices creates a strong case for strengthening the RET.

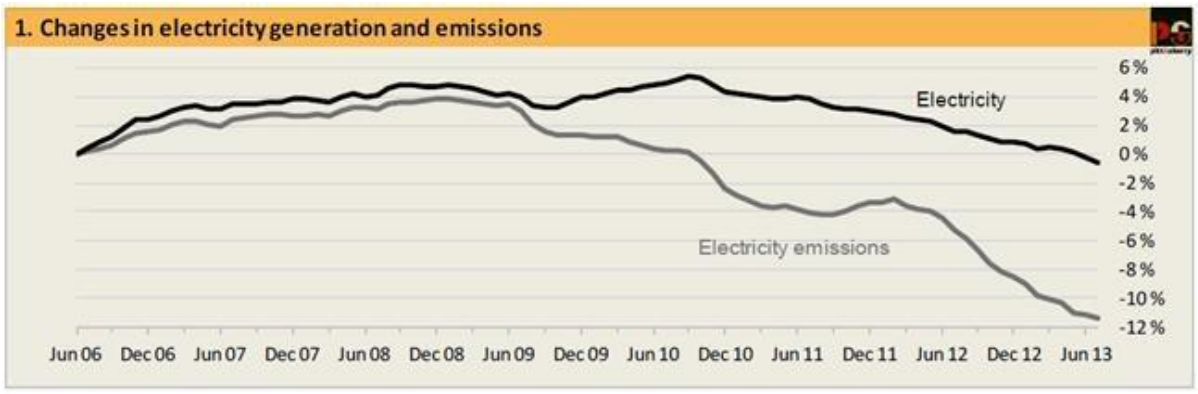
The effect of the RET on emissions reduction

The primary purpose of the RET is to reduce Australia's greenhouse gas emissions. It does this by substituting fossil-fuel-generated electricity with renewable generation. The RET has been effective in achieving this and, coupled with a fall in demand for electricity, this has led to a fall in total emissions from electricity generation.

The fall in demand for electricity has been caused by a number of factors that have been covered in detail by respected energy consultant Hugh Saddler in his paper for The Australia Institute, *Power Down.*[17] The main three causes he identifies are the success of energy efficiency programs, the price effect caused by the recent rapid increase in electricity prices discussed above and the structural change in the economy away from electricity-intensive industries.

While the fall in demand for electricity and accompanying fall in the supply of electricity goes some way to explaining the decrease in emissions from electricity, it does not explain the fall in the average emissions intensity of electricity. This is the volume of emissions created when each unit of electricity is created. This is highlighted in the carbon emissions index, CEDEX, published by consultancy Pitt&Sherry.[18] As Figure 6 shows, a gap between electricity production and electricity emissions has opened up since 2009. That is to say, the amount of emissions per unit of electricity created has been falling.

Figure 6: CEDEX Changes in electricity generation and emissions



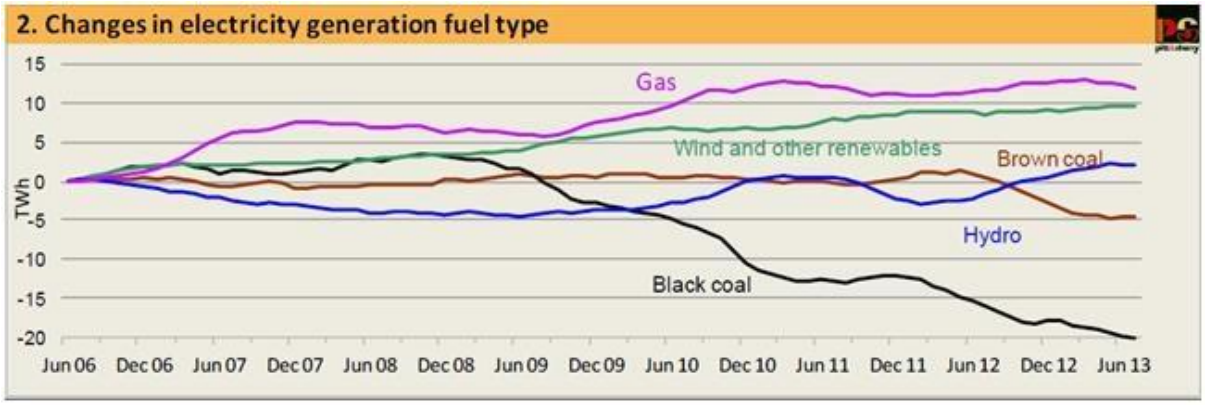
Source: Pitt&Sherry (2013) *CEDEX*

The reason for the fall in average emissions intensity of electricity is that there has been a change in the mix of generation. There has been a shift from coal-fired electricity generation to renewable and gas-fired electricity generation. This is highlighted in another graph from CEDEX in Figure 7 below.

[17] Saddler (2013). *Power down.*

[18] Pitt&Sherry (2013) *CEDEX.*

Figure 7: CEDEX Changes in electricity generation fuel type



Source: Pitt&Sherry (2013) *CEDEX*

As we can see there have been falls in both black- and brown-coal-generated electricity and at the same time a rise in renewable- and gas-generated electricity.

While gas is a fossil fuel and does generate greenhouse gas emissions when used to generate electricity, it produces fewer emissions than when coal is used. So the effect of the switch from coal to renewables and gas has had the effect of lowering the average emissions intensity of electricity generation in Australia.

The switch to renewable energy is in large part because of the incentives created by the RET. A report for the Clean Energy Council[19] found that 90 per cent of the additional renewable generation was attributable to the RET. The report also found that the RET, from its inception in 2001 until 2011, had been responsible for reducing emissions by 22.5 million tonnes of carbon dioxide equivalent (CO_2e). Without the RET, emissions in 2012 would have been four per cent higher.

As we get closer to 2020, the amount of renewable energy produced because of the RET will rise, and therefore the amount of abatement expected from the RET will also rise**.** A report for the Climate Change Authority has modelled the effect on emissions of removing the RET in 2013.[20] It found that, if the RET was abolished in 2013, then by 2031 Australia's carbon emissions would be higher by a total of 217 million tonnes of CO_2e.

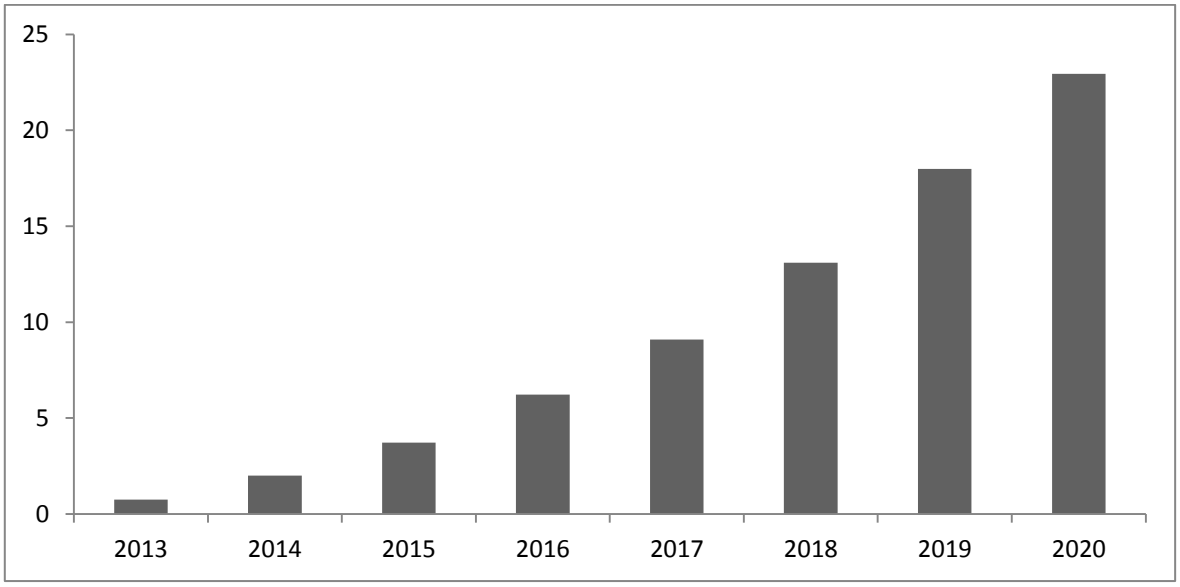
The modelling shows that from 2013 to 2020, abolishing the RET would add an additional 76 million tonnes of CO_2e. To put this into context, according to the government's figures[21] the abatement task from 2013 to 2020 is 457 million tonnes of CO_2e. This means the RET would be responsible for about 17 per cent, or one sixth, of the required abatement. The abatement each year from 2013 to 2020 is shown in Figure 8.

[19] SKM (2012a) *Benefit of the Renewable Energy Target to Australia's Energy Markets and Economy*.

[20] SKM (2012b) *Modelling the renewable energy target for the Climate Change Authority*.

[21] Australian Government Department of the Environment (2013) *Australia's Abatement Task and 2013 Emissions Projections*.

Figure 8: Estimated RET abatement (millions of tonnes of CO_2e abated)



Source: SKM (2012b). Modelling the renewable energy target for the Climate Change Authority

While the average emissions intensity of electricity generation in Australia has fallen, this is in part because of the switch to gas. As this paper has previously explained, gas prices are going to rise to the point where it is likely that gas-fired electricity generation will become unviable. If the fall in gas-fired generation is replaced by coal-fired generation then the average emissions intensity of electricity will rise.

If gas prices continue to rise there is a likelihood that only gas peaking plants – those gas plants that supply electricity at times of peak demand when the electricity price is very high – will continue to operate.

Renewables, the RET and public opinion

The Australia Institute conducted a survey of people's attitudes to renewable energy and the RET in March 2014. The survey was designed to gauge the general public's attitude to the amount of renewable energy, the government's involvement in encouraging renewable energy and the public's attitude to non-renewable forms of energy.

Table 1: Summary of polling results

Question	Response	% of respondents
In the future do you think Australia will...?	Need more renewable energy	86
	Need less renewable energy	3
	Have about the same as it does now	11
Do you think the government should support an expansion of renewable energy in Australia?	Yes	79
	No	8

	Not sure	13
Do you support a renewable energy target which mandates that 20% of electricity be produced from renewable sources by 2020?	Yes	71
	No	9
	Not sure	20
Do you think a target of 20% by 2020...?	Should be higher	31
	Should be lower	11
	Is about right	37
	Not sure	21

Source: TAI (2014) *Australia Institute Survey – March*. Number of respondents 1,445.

There was overwhelming support for more renewable energy, with 86 per cent of respondents in favour of more renewable energy in the future and 82 per cent wanting more renewable energy right now.

The general public's support for renewable energy also translates into a desire for the government to support renewable energy. Seventy-nine per cent of respondents agreed that the government should support an expansion of renewable energy, with 71 per cent supporting the RET.

Survey respondents were also asked if they wanted to see more or less electricity generation from different sources of energy. Ninety per cent of respondents wanted more electricity generated from solar and 80 per cent wanted more electricity generated from wind. This compares with 68 per cent of respondents wanting to see less electricity generated from coal.

The survey showed that the general public would prefer to see more electricity generation from renewable forms of electricity and for that to come at the expense of fossil fuels. This is interesting in the context of a possible switch out of gas-generated electricity discussed earlier. Without continuing support for renewables it is likely that coal will replace gas-fired electricity generation. It would seem from the survey results that this is not an outcome that the general public would regard as desirable.

This result is in line with other polling that shows strong public support for the renewable energy target.[22] The fact that renewable energy was so strongly supported in the community was probably a factor in the decision of the Liberal and National parties to support the expansion of the RET to 20 per cent by 2020. The legislation passed both houses of Parliament unanimously in 2009.[23]

The survey results show there is a strong appetite in the general public for ongoing support from the government for renewable energy. Sixty-eight per cent of respondents were happy with the RET target or wanted it increased. The strong support for the RET included some support for a higher target. While 37 per cent of people thought the 20 per cent target by 2020 was correct, 31 per cent thought it should be higher. Only 11 per cent thought it should

[22] EMC (2014). *Essential Report: Renewable energy target*.

[23] Passed House of Representatives 17th August 2009 and Senate 20th August 2009

be lower. This seems to indicate that any attempt by the government to water down or repeal the RET would not have much electoral support.

The public opinion paradox of action versus cost

With the public firmly in favour of renewable energy and the RET, the current government might seem out of step raising questions about its effect on electricity prices and putting people who are thought to be sceptical of climate change in charge of a review of the RET. While there is strong support for renewables, other surveys have shown that there is a strange paradox at the heart of people's attitudes to renewable energy and climate change policy more broadly.

The CSIRO highlights this paradox in a survey it did in 2011.[24] The survey found strong support for renewable energy but also a high level of sensitivity to electricity price rises. As discussed above, large electricity price rises, largely unrelated to the RET, have caused this issue to become a sensitive one for consumers. The paradox arises from the fact that, while the public is very keen on expanding renewable energy and enthusiastic about government assistance to renewable energy, they are at the same time very reluctant to pay for it.

This helps explain the current government's strategy about highlighting the RET's effects on electricity prices, even if these effects are relatively minor. What is important to understand, however, is that while the public is sensitive to electricity price rises, they are also overwhelmingly supportive of renewable energy. They are supportive of renewable energy replacing fossil fuel energy, in particular coal. They are also in favour of government support for renewable energy, including support for the RET.

This indicates that a very important part of the debate around the RET will centre on its effect on electricity prices. As this paper has shown, the RET's effect on electricity prices has been relatively minor. But with such large increases in electricity prices in recent years, the general public is concerned about anything that might increase prices further.

Why is there opposition to the RET?

If renewable energy is so popular, why is there are push in the government to wind back the RET? Part of the answer is ideology. There is a view by some in the government that renewable energy is a political left/right issue. The belief by some in the government is that, because the left support renewable energy, it can't be good. There is also an ideological view within the government that the RET subsidises renewable energy and governments should avoid subsidising industries wherever possible. The two ideological issues also reinforce each other.

Part of it also comes from fierce lobbying from fossil fuel electricity generators, who have been telling the government and the public that the RET is bad policy and needs to be wound back or scrapped altogether. The strong opposition by fossil fuel generators to the RET can be best understood by looking at Figure 7. This shows that, while gas generation has risen, this has been more than offset by a drop in black- and brown-coal generation. With total demand for electricity falling, and renewable generation rising, this is causing fossil fuel generation to be squeezed out of the market. The industry therefore has to accept a smaller slice of a smaller pie.

The result has been the mothballing of coal-fired generators. Coal-fired power stations are expensive pieces of capital and having them sit idle is costly for their owners. The generators that have been mothballed so far have been the older and less efficient ones, but if the

[24] CSIRO (2011). *The Australian public's preference for energy sources and related technologies*.

current trend continues then more fossil-fuel-fired generation will be forced from the market. This is of deep concern to the owners of these power stations. It also explains the lobbying that is being done on behalf of the owners of fossil fuel generators.

The expansion of the RET to the new target of 20 per cent by 2020, or more accurately 45,000 MW/hs, was conceived at a time when demand for electricity was expanding. At the time, electricity generators were unlikely to expand their coal generation, with additional demand being met by expansions in renewable and gas generation. What was not expected was much of a reduction in coal generation.

In a market of expanding electricity demand, the RET was to be met from additional demand and existing generators would not be greatly impacted. Because of this there was little opposition to the expanded RET from existing fossil fuel generators. As the reality of falling demand was realised, existing generators became more and more concerned about the impact of the RET.

Origin Energy in its submission to the RET review, claimed that the RET was never expected to crowd out existing generation. They go on to say that "the RET distorts the wholesale spot market by forcing additional generation that is not required into the system."[25] This highlights existing electricity generators biggest complaint with the RET. It is forcing down wholesale prices and driving them out of the market. It is not electricity consumers that they are concerned about, but their own bottom line.

Will the RET cause some electricity generators to lose money or go broke?

The RET is a policy that is designed to reduce Australia's emissions from electricity generation by moving to renewable generation. This means that highly emissions-intensive generation like that from coal will have to be reduced and replaced with renewable generation. If you are the owner of a coal-fired power station then this could mean less production and the possibility that your power station will have to close.

While this, understandably, upsets the owners of those power stations, no business should feel entitled to be shielded from change. It has been well understood for many years that the world will need to reduce consumption of fossil fuels if it is to combat climate change. The owners of coal-fired power stations know this and ultimately take a risk in owning an asset that will have to be shut down in order to defeat climate change.

Fossil fuel power stations are also coming under threat as renewable energy becomes cheaper and pushes down wholesale electricity prices at peak times. Disruptive new technologies regularly sweep through market economies. They are often good for consumers and bad for incumbent businesses. New companies thrive, some companies adapt and others go broke. When digital cameras became popular in the 1990s, photo development labs died out. Consumers' ability to download movies killed off many video rental stores. While these changes are unfortunate for some industries, they create opportunities for others – consumers are almost always better off.

Is the RET inequitable?

The biggest benefit of the RET to households, apart from lower emissions, comes through the SRES. The SRES includes things like solar hot water systems and solar PV installations on household rooftops. Effectively the SRES gives households RECs up-front for the

[25] Origin (2014) *Submission: Review of the Renewable Energy Target*.

emissions reduction that their new installations will create in the coming years. They can then use those RECs as a way of offsetting the cost of the installation.

It has been argued that this is inequitable since only relatively well-off households can afford the upfront cost of a solar hot water or PV system. If the government is concerned about this issue of equity then there are a number of things that it can do to improve the RET.

The first is to tie some of the funds in the emissions reduction fund (ERF) to installing solar hot water and PV systems to public housing. This would not only reduce emissions, by expanding the amount of renewable energy, which is the aim of the ERF, it would also reduce energy costs to some of the poorest Australians. In addition it would help achieve the government's million solar roofs program.

If equity is truly a major concern of the government, it should enable lower income households to substantially reduce their energy bills – this would simultaneously reduce greenhouse gas emissions and make Australia a more equitable place.

Conclusion

The RET is an important policy for transforming the way Australia generates electricity. It has been very successful in reducing Australia's greenhouse gas emissions and is likely to make an even greater contribution in the future, particularly in terms of its ability to chip away at Australia's five per cent emissions reduction target.

With the announcement of the latest review of the RET, the government has indicated that it is planning to water down or scrap it. This will make the task of achieving the five per cent emissions reduction target significantly harder than it is at the moment. It will also come at a time when there is likely to be significant readjustment in electricity generation, with rising gas prices likely to force out some gas-fired generators.

A reversion to coal-fired generation could see emissions from electricity generation begin to rise again, after falling for four years. This will further compound our ability to achieve the emissions reduction target. One way to avoid this scenario would be to strengthen the RET, increasing the amount of renewable energy as gas-fired generation declines.

The RET is an effective market-based policy for both transforming Australia's electricity generation resources and reducing emissions. It has had a minimal impact on the cost of electricity to consumers and is likely to lower prices in the long run. Now is not the time to step back from renewable energy.

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