



# CLIMATE CHANGE AUTHORITY REVIEW OF THE RENEWABLE ENERGY TARGET 2014

6 November 2014

## 1. Summary and Key Recommendations

Thank you for the opportunity to contribute to the Climate Change Authorities Review of the Renewable Energy Target (RET).

WWF-Australia is part of the WWF International Network, the world's largest and most experienced independent conservation organisation. We have more than 250,000 supporters in Australia, five million supporters worldwide and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural resources and to build a future in which humans live in harmony with nature. WWF has been an advocate for national and international action to avoid dangerous climate change and transition to 100% renewable energy for more than two decades.

**The evidence the climate change is occurring is now irrefutable.** According to the IPCC, the three most recent decades have all been warmer than all preceding decades (since 1850). The period covering 1983 - 2012 was the warmest 30-year period in 800 years and likely the warmest of the past 1400 years. Sea level rise has accelerated, ocean acidification has increase, and the melting of glaciers and ice sheets in the last decade has been several times faster than the melting during the 1990's.<sup>1</sup>

**Scientists are now 95% to 100% certain that humans have caused the majority of climate change** since the 1950's.<sup>2</sup> Without an aggressive mitigation strategy that sees greenhouse gas emissions stabilise this century, global temperature looks set to significantly exceed 2°C warming above pre-industrial levels by 2100 – crossing a threshold into catastrophic warming with devastating global consequences.

Burning fossil fuels, like coal and gas, is the major contributor to the excess greenhouse gas emissions in the atmosphere that is causing global warming and subsequent climate change. Transition our global energy system to 100% renewable energy well before 2050 will be critical to reduce greenhouse gas emissions if we have a chance of keeping temperature rise well below 2 degrees celsius.

Research by Climateworks Australia, ANU, CSIRO and the Centre for Policy Studies indicates that net emissions from electricity will need to approach zero before 2050 for Australia to play its fair part in avoiding 2°C. The modelling from these research pieces will require the carbon intensity of Australian electricity to fall by at least half by 2030. This will require policies to facilitate growth of renewable energy and retirement of coal fired power.

With the repeal of the Clean Energy Act and carbon price the RET remains the only real measure to reduce emissions in the electricity sector.

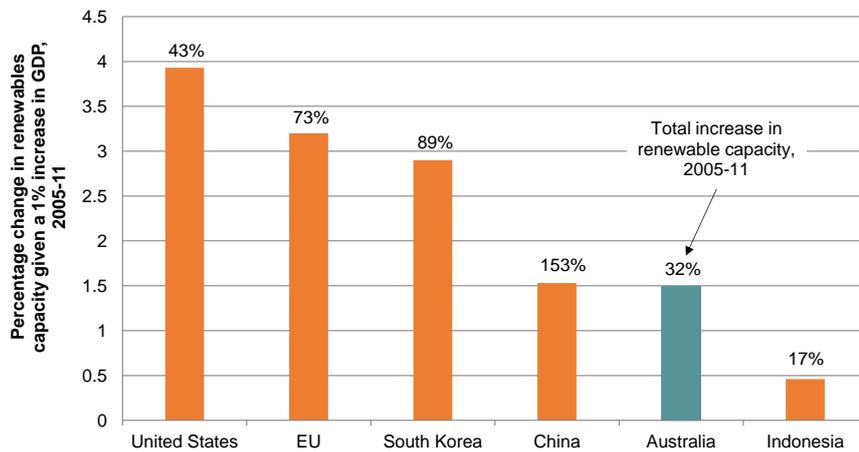
Australia is already behind the pace of renewable energy development with our major trading partners, adding less capacity than four of five key trading partners analysed by Vivid Economics<sup>3</sup> over 2005-2011. In the United States renewable energy capacity grew nearly four times faster than GDP over this period, while in Australia growth was only 1.5 times GDP growth.

<sup>1</sup> IPCC - Working Group 1 Physical Science Report <http://www.climatechange2013.org/>

<sup>2</sup> IPCC - Working Group 1 Physical Science Report <http://www.climatechange2013.org/>

<sup>3</sup> Vivid Economics (2014) Review of International trends and policy Developments

[http://www.wwf.org.au/news\\_resources/resource\\_library/?9981/Review-of-international-emissions-trends-and-policy-developments](http://www.wwf.org.au/news_resources/resource_library/?9981/Review-of-international-emissions-trends-and-policy-developments)



Source: Vivid Economics based on EIA data

Any adjustments to the RET need to strengthen rather than weaken its ability to drive sustained decarbonisation and provide a stable long-term outlook for the renewable industry and its workforce.

WWF-Australia’s key recommendations in response to the call for submissions paper are outlined below.

### 1. Maintain current 41,000 GWh Large-scale Renewable Energy Target (LRET) for 2020

WWF-Australia strongly recommends maintaining the 41,000 GWh target for the LRET.

We support the conclusions of the Climate Change Authority’s 2012 Renewable Energy Target Review that “the benefits of changing the target do not appear likely to outweigh the costs of reduced investor confidence”.<sup>4</sup>

Reducing or repealing the RET will provide little to no benefit to consumers and businesses, and may indeed increase cost of living pressures. Analysis by ROAM Consulting found if the RET was repealed average retail electricity prices would be \$51 per annum higher in 2020 and an average of \$100 a year higher beyond 2020.<sup>5</sup>

The RET has successfully mobilised national and international investment and built a strong domestic renewable energy industry which will be important to Australia’s future economic prosperity. The renewable energy target has mobilised around \$20 billion in investment to date and will generate nearly \$15 billion more by 2020 under the current target.<sup>6</sup> Reducing the RET would threaten these investments and harm Australia’s reputation as a reliable investment destination.

Reducing the RET will put jobs, livelihoods and businesses in renewable power under threat. The RET has generated more than 24,000 jobs, and is forecast to generate a further 18,400 jobs by 2020 if it's put on a stable policy footing.<sup>7</sup>

The RET is also critical to achieving Australia’s international commitments to contribute to keeping global warming below 2 degrees and reduce emissions by 5 to 25% by 2020 below 2000 levels. With the repeal of the carbon pricing mechanism, the importance of the RET is increased. Without the RET the expenditure required under the Direct Action policy to reduce emissions by 5 to 25% by 2020 will be increased; this should be factored into the RET Review’s analysis.

To provide investment certainty over the investment timelines for renewable energy projects, the targets legislated in the *Renewable Energy (Electricity) Act 2000* must be inscribed as firm GWh targets and not changed to a percentage target which is subject to fluctuation as energy demand changes.

<sup>4</sup> Climate Change Authority 2012, Renewable Energy Target Review, Final Report, p.vii.

<sup>5</sup> ROAM Consulting 2014, RET policy analysis, report to the Clean Energy Council. <https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/ret-policy-analysis.html>

<sup>6</sup> ROAM Consulting 2014, RET policy analysis, report to the Clean Energy Council. <https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/ret-policy-analysis.html>

<sup>7</sup> ROAM Consulting 2014, RET policy analysis, report to the Clean Energy Council. <https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/ret-policy-analysis.html>

WWF's view is that the objectives of the *Renewable Energy (Electricity) Act 2000* remain appropriate and the RET is performing well against these. Any concerns in not being able to meet the 2020 RET target are resulting from policy uncertainty and the quick certainty can be given about the 2020 and post 2020 environment the better. International, successful Renewable Energy policies have been based on either a RET style policy or Feed-in Tariffs. A major change in approach in Australia at this point will significantly undermine investor confidence.

Research shows that there are benefits to investing earlier, even at small scale. For example, investment at a comparatively small-scale now can lead to exponential growth in installed capacity and reduces the chance of delaying the availability of large-scale capacity<sup>8</sup>.

More importantly the longer governments delay the transition the more costly it becomes. For example the International Energy Agency (IEA) found that for every \$1 of investment in low carbon transition between 2011 and 2020, it avoids an additional \$4.3 in required expenditure between 2021 and 2035 to compensate for the increased emissions.<sup>9</sup>

## **2. Extend and increase the RET to at least 137,000 GWh by 2030**

Analysis by Climate Risk<sup>10</sup> found that it will be critical to increase the RET target out to 2030 to avoid a stalling of the industry after 2020. Given repeal of the carbon price, increasing the RET will provide a safety net for Australia's renewables industry ensuring there is no investment shortfall if a carbon price is not re-introduced or if it is re-introduced and is low. WWF recommends a 2030 target of between 137,000 GWh to 169,000 GWh which is equivalent to 43% to 53% of the Business-as-Usual (BAU) electricity demand projections used in the 2012 analysis.

WWF's goal is for a transition to 100% renewable energy by 2050. The Renewable Energy Target (RET) will play a critical role in achieving this goal, alongside the carbon price mechanism, and energy efficiency measures.

Climate Risk found this will require 169,000 GWh of renewable energy to be produced by 2030 (requiring average growth rates of 20%). One hundred per cent renewable energy could still be achieved if 137,000 GWh of renewable energy is produced by 2030, but this will require growth rates closer to 30% after 2030.

The Climate Risk analysis found that in the absence of a sufficiently high carbon price or some other investment signal there is a strong risk that investment in Australia's renewable energy industry will collapse if the existing RET is not increased after 2020. For all tested carbon prices modelled in *Our Clean Energy Future*, all renewable energy technologies – except for solar hot water and hydro-electricity – will likely cease deployment in 2020. This is because renewable energy prices will not have reached price convergence with the electricity market before the current RET scheme is halted.

To prevent an industry collapse, not only do we need to maintain the current 2020 GWh target, but a post 2020 'safety' RET will be required to meet the cost shortfall between renewable energy costs and energy prices.

## **3. Retiring Australia's oldest and most polluting coal fired power stations.**

While the RET as currently legislated is necessary to achieve Australia's decarbonisation objectives, it is not sufficient.

Firstly, since the RET's targets flatten out at 2020, the share of renewable energy is likely to stagnate after that point, and even fall. Modelling by ACIL Allen shows that the proportion of renewably-sourced power is projected to start to decline before 2025, as dormant coal plant re-enters the market. This will also lead to an increase in electricity sector emissions.

Secondly, even a significantly expanded RET is insufficient for decarbonisation. Decarbonising electricity also requires the permanent closure of emission-intensive power stations. Currently some 4,000 MW of coal plant has

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<sup>8</sup> WWF and Carnegie (2009) Power to Change: Australia's Wave Energy Future.

[http://awsassets.wwf.org.au/downloads/fs053\\_power\\_to\\_change\\_australias\\_wave\\_energy\\_future\\_10jun09.pdf](http://awsassets.wwf.org.au/downloads/fs053_power_to_change_australias_wave_energy_future_10jun09.pdf)

<sup>9</sup> IEA World Energy Outlook, 2011 [www.worldenergyoutlook.org](http://www.worldenergyoutlook.org)

<sup>10</sup> Our Clean Energy Future 2012, <https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/ret-policy-analysis.html>

been mothballed in response to declining demand. However, this capacity is not exiting the market due primarily to policy uncertainty, as well as decommissioning and remediation costs. As mothballed plant may return to the market when electricity consumption starts to increase, it deters investment in new, cleaner electricity supply. If this dormant capacity is not permanently removed from the market, it will severely diminish the growth prospects of Australia's burgeoning renewables industry.

#### **4. Maintain the Small-scale Renewable Energy Scheme(SRES) as is**

WWF supports the conclusions of the Climate Change Authority's 2012 Renewable Energy Target Review that the Small-scale Renewable Energy Scheme continues and remains separate from the LRET to avoid further undermining investor confidence.<sup>11</sup> With State Governments significantly reducing feed-in tariff schemes it is important to maintain the SRES to support and grow the industry until price parity has been reached.

The small scale scheme helps make roof top solar affordable for Australian Families. Rooftop solar gives family the power to manage their bills and their energy.

Further, there are hundreds of SMEs and thousands of jobs involved in the solar industry, both will be negatively affected by any reduction in the RET.

#### **5. Band or weight the RET after 2020 to support concurrent technology development**

The RET only support the cheapest renewable and low pollution technologies as they become cost competitive. A gap will still exist for emerging technologies such as solar thermal, geothermal and wave. Investing in these technologies and resources now will help provide experience that can reduce the cost or risk of future deployments at scale; drive competition; improve market reliability and security; achieve 100% renewables by 2050; and accelerate transition if science or policy requires Australia to reduce emissions faster than current goals.

Climate Risk finds that Australia's six main renewable energy sources need to grow concurrently to achieve 100% renewables by 2050, or risk some technologies having to grow at unsustainably high rates at later dates. Current policies such as the carbon price and the current RET design favour low cost technologies first. Banding or weighting the RET will give less developed/more costly technologies a leg up to develop and bring down their cost curves, alongside cheaper renewable technologies.

A post-2020 'Safety' RET should be banded or weighted, with different targets for each renewable energy industry, and with a mechanism to phase out each industry as it achieves cost convergence with the energy and carbon market.

#### **6. Retain the Clean Energy Finance Corporation (CEFC) and the Australian Renewable Energy Agency (ARENA)**

Both the CEFC and ARENA are critical to maintaining a portfolio of support mechanism for Renewable Energy from development to deployment and ensuring Australia is well positioned for a carbon constrained global economy. The Clean Energy Finance Corporation (CEFC) would help grow some emerging technologies by providing finance to overcome capital market barriers that hinder the financing, commercialisation and deployment of higher cost renewable energy, energy efficiency and low emissions technologies. The CEFC is also economic positive. To avoid potential price uncertainty in the RET and maximise government funds WWF-Australia recommends making CEFC projects additional to the current RET target.

#### **7. Move to four-yearly reviews by the Climate Change Authority**

WWF supports the conclusions of the Climate Change Authority's 2012 Renewable Energy Target Review that the Authority should review the RET every four years to promote greater investor confidence.<sup>12</sup> The Climate Change Authority is the appropriate body to conduct these reviews and should be retained.

Unfortunately the various reviews into renewable policies and energy prices, together with the intended scrapping of the CEFC, ARENA and the carbon price<sup>13</sup>, are leading to considerable uncertainty for energy investors and will

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<sup>11</sup> Climate Change Authority 2012, Renewable Energy Target Review, Final Report, p.vii.

<sup>12</sup> Climate Change Authority 2012, Renewable Energy Target Review, Final Report, p.vii.

significantly delay Australia's transition to a competitive, low cost renewable energy supply. Australia is at risk of going backwards.

The next review should not revisit the 2020 target but focus on the RET's capacity to contribute to Australia's post-2020 emission reduction goals. The Climate Change Authority should be the sole entity responsible for reviewing the RET. As an independent authority, it is best placed to avoid further damaging politicisation of the RET and the review process.

## **8. Remove waste coal mine gas from the RET**

WWF's recommendation is that waste coal mine gas should be removed from eligibility. This was included under the RET as a bridge between the cessation of the NSW Greenhouse Gas Abatement Scheme and the introduction of a national carbon price scheme. Waste coal mine gas would be more appropriately supported by another mechanism such as the Direct Action policy.

## **9. Cost of living**

According to modelling by ROAM, Australian households will pay over \$50 more for electricity in 2020 if the RET is scrapped. Beyond 2020, household bills would increase up to \$140 more per year. This is because fewer renewables mean more gas, which is set to triple in price this decade. In the meantime, renewable energy will continue to get cheaper as technology improves and more is built.

Wind energy is already driving down wholesale electricity prices,<sup>14</sup> whereas fossil fuels such as gas are driving up wholesale prices.<sup>15</sup>

Increasing and extending the RET will further benefit consumers. According to modelling done by ROAM, if the RET is extended to a 30% target by 2030 for example (a fixed LRET of 65,000 GWh), residential electricity bills will continue to decrease relative to BAU in the longer term.<sup>16</sup> This reflects the continued merit order effect and the low marginal cost of renewables.

Further, the uptake of solar rooftop systems, made more affordable as a result of the small scale RET and some state-based incentives has meant millions of Australian households are saving on the energy Bills and taking control of their energy.

The following sections outline not only why we need renewable energy in Australia but why we should expand the RET, to provide a reliable, efficient, cost effective, competitive low emissions energy sector.

## **2. The Need for Renewable Energy in Australia**

It is WWF's view that having the right policy setting to drive investment in renewable energy will be critical to ensure a low cost, low carbon, competitive energy sector. The RET is critical to achieving these goals.<sup>17</sup>

Australia and the international community have agreed to keep warming below 2 degrees Celsius. According to the Climate Change Authority, Australia's fair contribution to this goal would be 19% below 2000 levels by 2020 and 40-60% reductions by 2030.

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<sup>13</sup> Removing the carbon-pricing scheme altogether would leave an AUD\$67 billion deficit in low-carbon energy investment requirements; this shortfall would need to be addressed using other policy measures, see WWF and Climate Risk (2012) Our Clean Energy Future: 100% Renewable Energy Powering our Future. <http://www.wwf.org.au/?5062/Our-clean-energy-future---100-renewables-powering-Australias-future>

<sup>14</sup> In South Australia, despite wind contributing to 21% of the state's electricity, wholesale electricity prices have not increased over the past five years; instead they dropped from \$50 per MWh to \$49 MWh during that time period. Wind now routinely displaces more expensive technology such as open-cycle gas, see Osmond and Osborne (2011) Peaking Capacity, CO<sub>2</sub>-e emissions and pricing in the South Australian Electricity Grid with high wind penetration. Windlab Systems Pty Ltd.

<sup>15</sup> See for example The Treasury and DCCSRTE (2013) Climate Change Mitigation Scenarios: Modelling report provided to the Climate Change Authority in support of its Caps and Targets Review, p.56

<sup>16</sup> ROAM Consulting 2014, RET policy analysis, report to the Clean Energy Council. <https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target/ret-policy-analysis.html>

<sup>17</sup> See for example WWF and Climate Risk (2012) Our Clean Energy Future: 100% Renewable Energy Powering our Future. <http://www.wwf.org.au/?5062/Our-clean-energy-future---100-renewables-powering-Australias-future> and Reputex (2013) Emissions trading versus direct action: Achieving Australia's emissions reduction objectives.

WWF supports UNFCCC agreements such as the Durban Action Plan (2011) to stay well below 2 degree Celsius global warming, and we support the position of the group of Least Developed Countries (LDC) and of the Association of Small Island States (AOSIS) to not exceed 1.5 degree Celsius, above pre-industrial levels. To contribute its fair share and be in a position to contribute to a below 1.5 degree goal, WWF believes Australia must aim for national emissions reductions of at least 25% by 2020 and 60-82% by 2030 below 2000 levels.

Australia should achieve as much of its targeted emission reductions as possible domestically to ensure our economy is well positioned for a carbon-constrained future.

The energy sector is the largest contributor of Australia's greenhouse gas emissions and will need to do more of the heavy lifting as some sectors like agriculture may struggle to meet required emissions reduction targets. This means the energy sector will need to undergo a transformation over the coming decades, shifting to 100% renewable energy, if we are to meet our global and domestic targets.

Australia will need a range of renewable energy technologies and resources in the energy market as early as possible to create a diverse, competitive, and reliable energy market that can decarbonise faster if science and international developments deem necessary.

This requires Government to foster concurrent development of renewable industries now and not waiting for each technology to become 'cost competitive' in their own time.

Research shows that there are benefits to investing earlier, even at small scale. For example, investment at a comparatively small-scale now can lead to exponential growth in installed capacity and reduces the chance of delaying the availability of large-scale capacity<sup>18</sup>.

More importantly the longer governments delay the transition the more costly it becomes. For example the International Energy Agency (IEA) found that for every \$1 of investment in low carbon transition between 2011 and 2020, it avoids an additional \$4.3 in required expenditure between 2021 and 2035 to compensate for the increased emissions.<sup>19</sup>

Already in Australia, the cost of renewable energy is falling. The Bureau of Resource and Energy Economics found that some renewables, such as on-shore wind, are already cheaper than new-build fossil fuel alternatives and that by 2030 the most cost effective energy option will be solar.<sup>20</sup>

Wind energy is already driving down wholesale electricity prices,<sup>21</sup> whereas fossil fuels such as gas are driving up wholesale prices.<sup>22</sup>

Unfortunately the various reviews into renewable policies and energy prices, together with the intended scrapping of the CEFC, ARENA and the successful repeal of the carbon price<sup>23</sup>, are leading to considerable uncertainty for energy investors and will significantly delay Australia's transition to a competitive, low cost renewable energy supply. Australia is at risk of going backwards.

Reputex, commissioned by WWF-Australia, found that, given the ERF does not impose a price on competing fossil fuel generation, if Australia's emissions trading scheme (ETS) is repealed, not only would renewable energy production shrink and Australia would fail to meet our renewable energy target, but it is likely that retail electricity prices would rise as a flow-on effect of repealing the ETS.<sup>24</sup> The Reputex study shows there would be a double impact from repealing the ETS: a big drop in renewable energy projects, meaning more pollution, and

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<sup>18</sup> WWF and Carnegie (2009) Power to Change: Australia's Wave Energy Future.

[http://awsassets.wwf.org.au/downloads/fs053\\_power\\_to\\_change\\_australias\\_wave\\_energy\\_future\\_10jun09.pdf](http://awsassets.wwf.org.au/downloads/fs053_power_to_change_australias_wave_energy_future_10jun09.pdf)

<sup>19</sup> IEA World Energy Outlook, 2011 [www.worldenergyoutlook.org](http://www.worldenergyoutlook.org)

<sup>20</sup> <http://www.bree.gov.au/sites/default/files/files//publications/aeta/AETA-Update-Dec-13.pdf>. Pg.10.

<sup>21</sup> In South Australia in 2011, despite wind contributing to 21% of the state's electricity, wholesale electricity prices had not increased over the past five years; instead they dropped from \$50 per MWh to \$49 MWh during that time period. Wind now routinely displaces more expensive technology such as open-cycle gas, see Osmond and Osborne (2011) Peaking Capacity, Co2-e emissions and pricing in the South Australian Electricity Grid with high wind penetration. Windlab Systems Pty Ltd.

<sup>22</sup> See for example The Treasury and DICCSRTE (2013) Climate Change Mitigation Scenarios: Modelling report provided to the Climate Change Authority in support of its Caps and Targets Review, p.56

<sup>23</sup> Removing the carbon-pricing scheme altogether would leave an AUD\$67 billion deficit in low-carbon energy investment requirements; this shortfall would need to be addressed using other policy measures, see WWF and Climate Risk (2012) Our Clean Energy Future: 100% Renewable Energy Powering our Future. <http://www.wwf.org.au/?5062/Our-clean-energy-future---100-renewables-powering-Australias-future>

<sup>24</sup> Reputex (2013) Policy brief: Renewable Energy and the Carbon Price. [http://www.wwf.org.au/news\\_resources/?7663/policy-brief-renewable-energy-and-the-carbon-price-brief-prepared-for-wwf-australia](http://www.wwf.org.au/news_resources/?7663/policy-brief-renewable-energy-and-the-carbon-price-brief-prepared-for-wwf-australia)

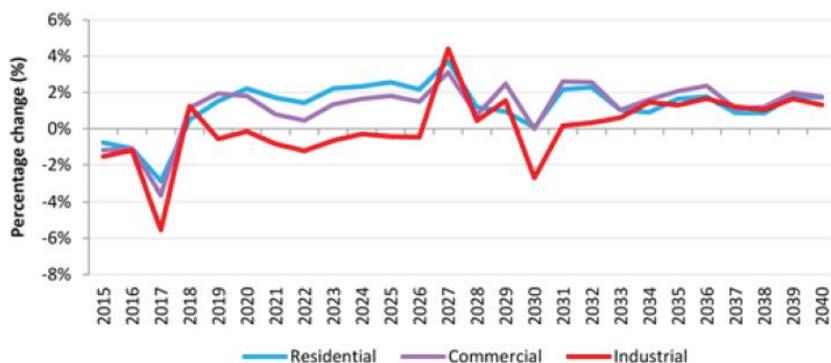
higher electricity prices for consumers. Repealing or reducing the RET, would have similar effect and would lead to higher wholesale prices. In 2011, WWF International and leading renewable energy consultants, Ecofys, developed a pathway for the world to achieve 100% renewable energy by 2050. The report showed that such a transition is not only possible but also affordable and cost effective.<sup>25</sup>

In 2012 WWF-Australia commissioned Climate Risk (the report, *Our Clean Energy Future: 100% Renewables Powering our Energy Future*, is attached to this submission) to assess the feasibility of achieving a transition to 100% renewable energy in Australia, and the impact that different policy settings will have on the transition to 100% renewable energy. For the electricity sector, without including expansion of land-based transport, Australia could achieve 100% renewable energy by 2037. If we are to achieve 100% renewable energy in all energy sectors, then we must tackle transportation and electrify the transport system, this could be achieved by 2050.

100% renewable energy can be achieved in Australia, tapping into our vast renewable energy resources. Australia receives an average of 58 million Peta Joules (PJ) of solar radiation per year, approximately 10,000 times larger than its total energy consumption<sup>26</sup>. Geothermal could provide 26,000 times our annual energy consumption<sup>27</sup>. Near-shore wave energy can provide approximately four times our current national power needs, including 35 per cent of our baseload power needs<sup>28</sup>. We also have world class skills, infrastructure and know how. Not surprisingly, polling shows that renewable energy also has strong public support. The average Australian can see the great potential in renewable energy.

### 3. Negative Impacts of cutting the RET

The recent Warburton review of the RET recommend that the 41,000 GWh Large-scale Renewable Energy Target (LRET) be cut to around 16,000 GWh by closing the scheme to new entrants, or cut to around 25,500 GWh by setting its growth to match 50 per cent of the growth in electricity demand. Both options would dramatically cut renewable energy growth, however there would be no reduction in electricity prices. These results are consistent with several other modelling exercises over the last year from Jacobs<sup>29</sup>, Bloomberg New Energy Finance<sup>30</sup>, ROAM Consulting<sup>31</sup> and Schneider Electric<sup>32</sup>.



Note: 50% of new growth option, % change in average retail electricity prices from current RET policy

Source: ACIL Allen, cited in the Warburton review's Report of the Expert Panel 2014

Cutting the RET would also see \$8-11 billion in renewable energy investment lost to 2030. New South Wales would be the biggest loser with over \$2 billion in foregone investment under a reduced RET, while South Australia would lose over \$2 billion and Queensland over \$1 billion.

<sup>25</sup> [http://assets.panda.org/downloads/the\\_energy\\_report\\_lowres\\_111110.pdf](http://assets.panda.org/downloads/the_energy_report_lowres_111110.pdf)

<sup>26</sup> <http://www.ga.gov.au/energy/other-renewable-energy-resources/solar-energy.html>

<sup>27</sup> <http://www.agea.org.au/media/docs/aboutgeoengfactsheetfinala4lowres.pdf>

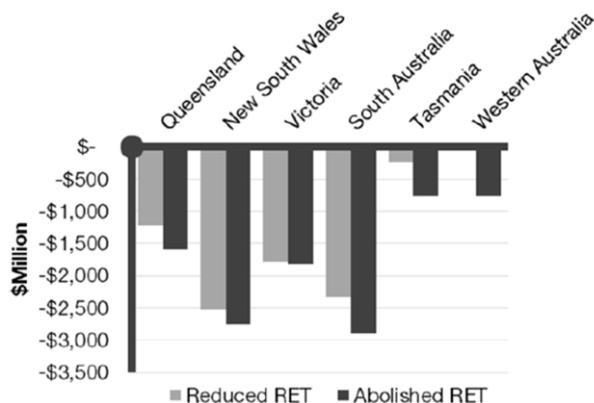
<sup>28</sup> <https://www.cleanenergycouncil.org.au/technologies/marine.html>

<sup>29</sup> Jacobs, 2014, *Impacts of Changes to the RET on Electricity Market Participants*.

<sup>30</sup> Bloomberg New Energy Finance, 2014. *Modelling Options for Australia's RET Review*.

<sup>31</sup> ROAM Consulting, 2014. *RET Policy Analysis--Report to the Clean Energy Council*.

<sup>32</sup> Jasper Noort, Simon Vanderzalm, Brian Morris, and Lisa Zembrodt, 2014. *Australia's Large-scale Renewable Energy Target: Three Consumer Benefits*, Schneider Electric.



Note: NPV 2015-2030 at a discount rate of 10%

Source: The Climate Institute, Australian Conservation Foundation and WWF-Australia 2014, based on modelling by Jacobs

Thousands of jobs in the solar industry are also put at risk by the Warburton review recommendations. Analysis by the REC Agents Association found that if the RET is abolished, demand for solar will fall by 40-50%, with the potential closure of thousands of small businesses across Australia.<sup>33</sup> The analysis also found that more than 90 per cent of the 21,000 Australians who work in the solar industry work for small and medium enterprises.

Cutting the RET could also result in billions in additional profit for coal and gas fired electricity generators according to modelling from Jacobs, jointly commissioned by WWF-Australia, the Climate Institute and the Australian Conservation Foundation<sup>34</sup>. This is driven primarily by a 7 per cent increase in coal-fired power production and higher wholesale electricity prices.

	50 per cent of new growth / Reduced RET	Closed to new entrants / Abolished RET
Extra emissions 2015-2020*	36	58
Extra emissions 2015-2030*	189	299
Less renewable energy*	Around 4900 MW less wind generation capacity in 2020	Around 9000 MW less wind generation capacity in 2020
Cumulative increase in average household electricity bills (NPV 2015-2030)*	\$119	\$186
Additional profit to coal and gas generators (NPV 2015-2030)^	\$10 billion	\$11 billion
Lost investment in new renewable energy capacity (NPV 2015-2030)^	\$8 billion	\$11 billion
Economic damages due to extra carbon pollution (social cost of carbon, NPV 2015-2040)^	\$14.4 billion	\$18.6 billion

Sources: \*ACIL Allen 2014<sup>35</sup>; ^The Climate Institute, Australian Conservation Foundation and WWF-Australia 2014<sup>36</sup>, conservatively assuming 50 per cent of new growth is similar to a 27,000 GWh LRET target

<sup>33</sup> Solar Business Services 2014, Industry Report prepared for REC Agents Association.

<sup>34</sup>ACF, TCI, WWF (2014) Who Really Profits from Reducing the RET

[http://www.climateinstitute.org.au/verve/resources/TCI\\_WWF\\_ACF\\_Policybrief\\_WhoReallyBenefitsFromReducingTheRET\\_file.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_WWF_ACF_Policybrief_WhoReallyBenefitsFromReducingTheRET_file.pdf)

<sup>35</sup> ACIL Allen 2014, RET Review modelling.

<sup>36</sup> TCI, ACF and WWF 2014, Who Really Benefits from Reducing the Renewable Energy Target?

If the Warburton review recommendations are adopted, carbon pollution is expected to increase by 36 to 58 million tonnes in total to 2020. Under the Government’s current policy this would require additional abatement to be purchased through the federal budget, via the Emissions Reduction Fund. Reducing the RET to around 27,000 GWh would require around an additional \$680 million in federal budget expenditure.<sup>37</sup> Given the currently allocated funds are very limited and will struggle<sup>38</sup> to purchase the 421 million tonnes of abatement to 2020 the Government estimates is needed, cutting the RET may place even the weak 5 per cent 2020 target out of reach.

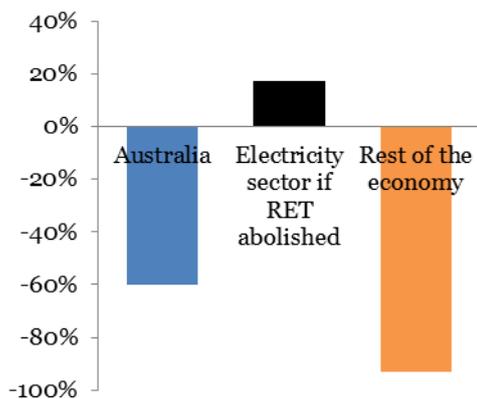
Australia needs to decarbonise its electricity sector in order to meet long term climate change goals. The Climate Change Authority found that Australia needs to reduce emissions to around 60 per cent below 2000 levels by 2030 to be consistent with a high chance of meeting a below 2 degrees goal, or a chance to meet a below 1.5 degree goal. The Government has said its policies will be aimed at reducing emissions domestically, with international permits having no role in current policy.

Australia’s total emissions target in 2030 would be 234 Mt with a 60 per cent target. However if the RET is abolished electricity sector emissions are projected to rise by about 17% from 2000 levels to around 206Mt in 2030.

That means the electricity sector would be 88% of allowable emissions in 2030 on its own. The rest of the economy would need to reduce emissions by about 93 per cent if we are going to meet a science-based target domestically.

If the electricity sector doesn’t make a significant contribution to emissions reductions then other sectors like transport, industrial processes and agriculture will have to make up the slack.

Figure 4: if the electricity sector does not cut emissions the burden will shift to the rest of the economy (% change 2000 to 2030)



## 4. The case for an expanded RET – Our Clean Energy Future Report

Given the global momentum towards renewable energy growth, WWF-Australia commissioned Climate Risk to assess:

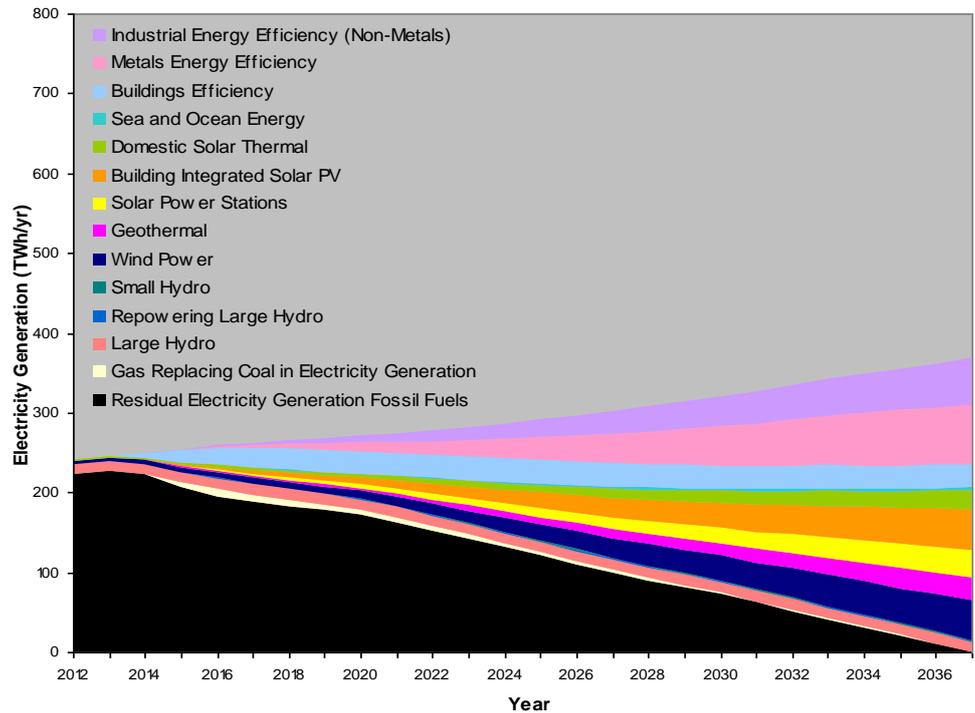
- The feasibility of achieving a transition to 100% renewable energy in Australia, with a particular focus on the electricity sector;
- A plausible timeline for achieving this transition; and
- The impact that different policy settings will have on the transition to 100% renewable energy.

<sup>37</sup> Based on modelling by SKM MMA and Monash University; cited by TCI, ACF and WWF.

<sup>38</sup> Reputex 2013, Emissions trading versus direct action.

The report, *Our Clean Energy Future*, found the transition to 100% renewable energy can be achieved in the Australian electricity sector as early as 2037 with stable industry growth rates of 20% per annum, not including electricity demand increase due to electrification in the transport sector (see figure 1 for growth wedges of renewable energy resources).

**Figure 1:** Energy wedge diagram for the 100% Constrained Renewable Scenario showing the deployment of renewable energy in the electricity generation sector assuming no additional baseline demand from the electrification of automotive transport.



To allow renewable energy to meet transport sector needs, electricity generation baseline demand can be expected to increase significantly. When this expanded demand is taken into consideration, the attainment of 100% renewable electricity in Australia is delayed to 2050 (at industry growth rates of 20% per annum). See figure 2 for growth wedges of renewable energy resources catering for electrification of land based transport.

**Figure 2:** Energy wedge diagram for the 100% Renewable scenario showing the deployment of renewable energy in the electricity generation sector with the additional baseline demand from the electrification of automotive transport (COA 2011a).

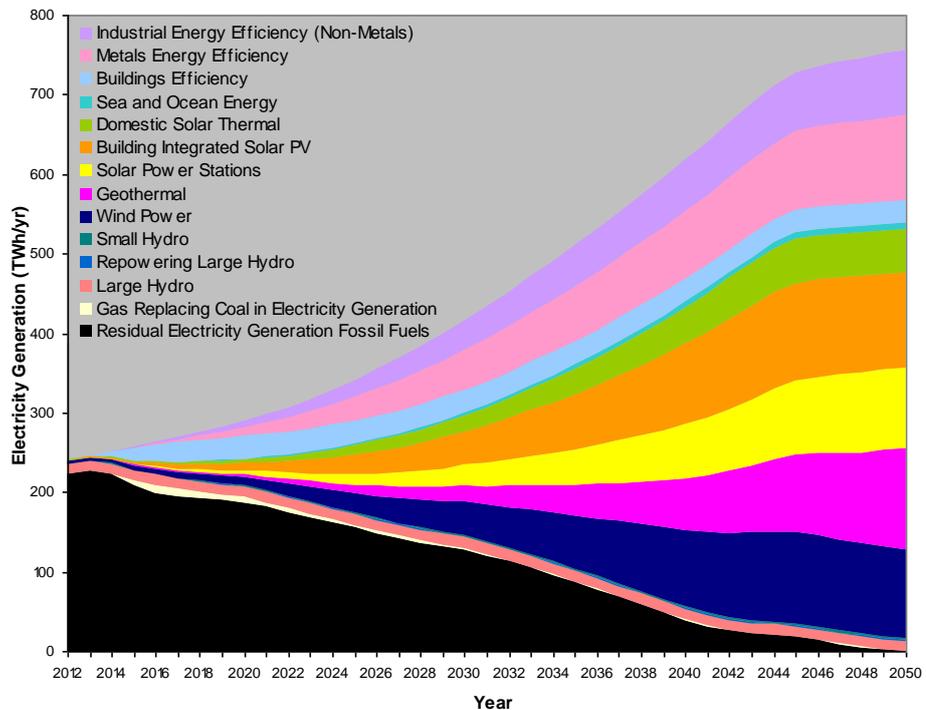


Table 1 below shows the amount in TWhs and fraction of renewable energy generation required between now and 2050 to achieve 100% renewable energy. It is important to note that the modelling importantly assumes higher

energy efficiency take-up than BAU<sup>39</sup>, which means that renewable energy percentages presented in the table are higher than those quoted for the current RET which are with respect to BAU.

**Table 1: The fraction of renewable energy in electricity generation from 2020 to 2050**

Renewable Generation (TWh) and Fraction of Total Electricity Generation (%)				
Year	When Additional Electricity Demand from Transport Electrification is Excluded		When Additional Electricity Demand from Transport Electrification is Included	
	2020	45	20%	48
2025	87	41%	102	39%
2030	130	64% (41% BAU)	169	57% (53% BAU)
2035	184	90%	272	76%
2037	206	100%	321	83%
2040		100%	399	91%
2045		100%	508	97%
2050		100%	538	100%

(Note: Because the modelling assumes higher energy efficiency than current Bureau of Resources and Energy Economics (BREE) (2011) and Treasury (2011) BAU, the percentages in the table are higher than those currently quoted for the current RET, and for context equivalent BAU percentages have been included for the 2030 period.)

### Transport missing in action

The report *Our Clean Energy Future* argues that if we are to achieve 100% renewable energy in all energy sectors, then we must tackle transportation. Transport accounts for approximately 15.3 per cent<sup>40</sup> of Australia’s emissions profile and rising.

There are very few policies currently aimed at reducing transport emissions, for example most of the sector was effectively excluded from the carbon price.

There have been some trends to reduce GHG emissions from vehicles, including greater fuel efficiency standards, inclusion of biofuels in fuel mix, the production of hybrid cars that use a mix of petrol and electrification, and fully electrified vehicles.

*Our Clean Energy Future* suggests that to achieve 100% renewable energy by 2050, Australia will need to significantly transform our transport sector shifting from combustion engines and their reliance of liquid to an electric automotive transport system, and at the same time allocate bio-hydrocarbons to aviation and shipping.

WWF-Internationals 2009 report “Plugged In: The End of an Oil Age”, outlined how the electrification of automotive transport offers a promising way forward<sup>41</sup>. According the report, grid-connected vehicle technology is available based on existing infrastructure and current technology. Battery electric vehicles (BEVs) and as a transition, plug-in-hybrid electric vehicles (PHEVs) – which may be supported by sustainable biofuels for range extension – can dramatically reduce the crude oil dependency of automotive transport in a highly efficient and sustainable manner<sup>42</sup>.

<sup>39</sup> Energy and emissions baselines are a combination of BREE (2011) and Treasury (2011)

<sup>40</sup> DCCCE (2011) Australian National Greenhouse Accounts: National Greenhouse Gas Inventory – December 2010, pg 10. <http://www.climatechange.gov.au/~media/publications/greenhouse-actg/national-greenhouse-gas-inventory-accounting-december-quarter-2010.pdf>

<sup>41</sup> WWF (2009) Plugged In: The End of an Oil Age. [http://awsassets.panda.org/downloads/plugged\\_in\\_full\\_report\\_\\_\\_final.pdf](http://awsassets.panda.org/downloads/plugged_in_full_report___final.pdf)

<sup>42</sup> WWF (2009) Plugged In: The End of an Oil Age. [http://awsassets.panda.org/downloads/plugged\\_in\\_full\\_report\\_\\_\\_final.pdf](http://awsassets.panda.org/downloads/plugged_in_full_report___final.pdf)

A report by McKinsey & Company “Roads Toward a Low Carbon Future” finds that a shift towards an electric transport system achieves the greatest amount of emission reductions by 2030 and has greater longer term emission savings, than a ‘mixed technology scenario’ and a ‘fuel efficient combustion engine scenario’.<sup>43</sup>

Electrifying Australia’s transport system will require some level of planning, including infrastructure for charging facilities, incentives to switch to electric vehicles and strong signal to vehicle manufacturers. WWF believe the Government should prepare a White Paper on electrification of Australia’s transport system to begin laying the foundations for transition.

In the meantime, the shift towards the electrification of the automobile is already underway at considerable speed. The Australian Energy Market Commission released Recommendations in December 2012 for changes to regulations to support the efficient integration of electric cars into the National Electricity Market. Therefore we should be planning now for increasing demand in the electricity sector and ensure we have the growth in renewable energy to meet the increased electricity demand.

## **Safety RET**

A carbon pricing mechanism, would play a critical role in transitioning to renewable economy, by bringing forward the cost competitiveness of each renewable energy technology in the open electricity market. However the analysis in *Our Clean Energy Future* shows that under all price scenarios<sup>44</sup> a carbon price is not enough on its own to provide industry development continuity until cost convergence is achieved.

The report examined the additional cost of employing low-carbon energy technologies above the business-as-usual price of energy (including carbon price) that would otherwise have been incurred, i.e. the marginal cost of abatement. The analysis found that under:

- Only the highest Treasury carbon price forecast is sufficient to avoid the need for ongoing renewable energy investment post-2020.
- Other estimates of the carbon price require at least a further AU\$13 billion to be spent in the 2020-2030 period.
- Removing the carbon pricing scheme would leave an AU\$67 billion deficit in low-carbon energy investment requirements that would need to be met using other policy measures.

The report looked at the performance of the current Renewable Energy Target (RET) and the role of a RET beyond 2020. The report found many of the renewable energy technologies deployed under the 2020 RET of 20% will not have reached grid parity by this time. Assuming the RET and current renewable energy finance mechanisms (such as the CEFC and ARENA) are not extended beyond 2020, there is insufficient market incentive to maintain growth in these industries unless there is either a sufficiently high and reliable carbon price, or an alternative mechanism to bridge the price shortfall.

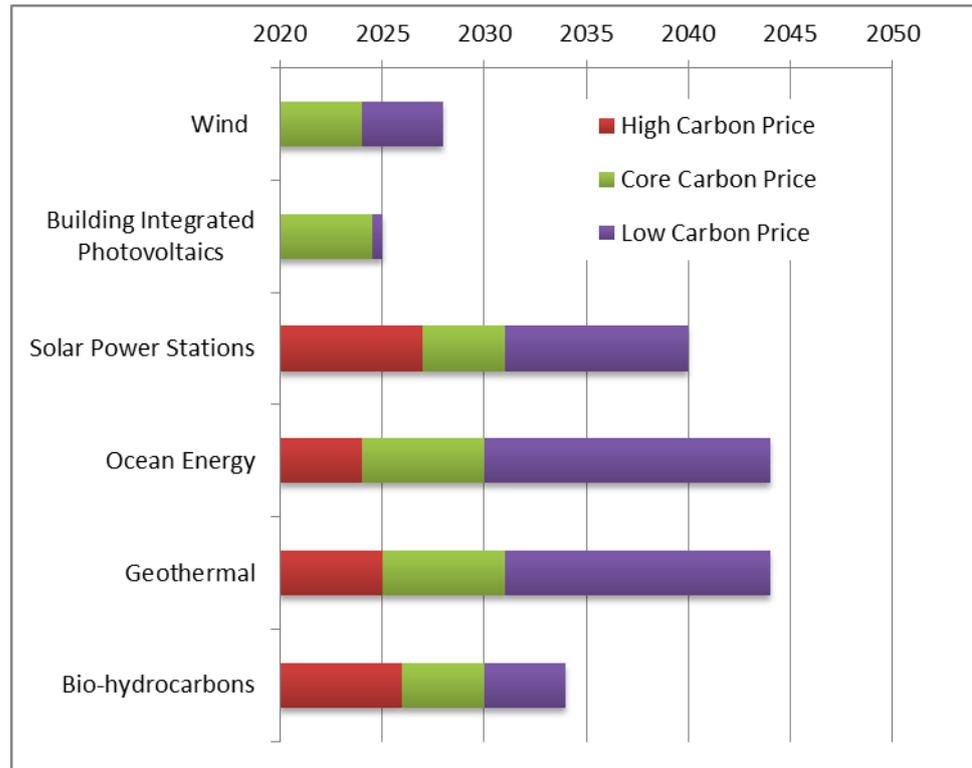
Without a carbon price and the current legislated renewable energy policy settings (no increase of the RET after 2020), most renewable energy industries will collapse in 2020 and cease project development for between 4 and 32 years until cost convergence is achieved subject to carbon price, see Figure 3.

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<sup>43</sup> McKinsey (2009) Road Towards a Low-Carbon Future: reducing Co2 emissions from passenger vehicles in the global transportation system. [http://www.mckinsey.com/client-service/ccsi/pdf/roads\\_toward\\_low\\_carbon\\_future.pdf](http://www.mckinsey.com/client-service/ccsi/pdf/roads_toward_low_carbon_future.pdf)

<sup>44</sup> The High Carbon Price and Core Carbon Price trajectories used in this report are taken from Treasury figures published in the “Strong Growth, Low Pollution: Modelling a Carbon Price” report (COA 2011a, COA 2011b). The Low Carbon Price projection (which falls to AU\$4/tCO<sub>2</sub>e in 2018 and rises linearly to AU\$30/tCO<sub>2</sub>e in 2050) is made up from low international carbon market forecast data from Bloomberg New Energy Finance and the European Commission (BNEF 2012, BNEF 2011, BNEF 2010, EC 2006).

**Figure 3:** The duration of renewable energy industry collapse and stall for each of the carbon prices once the current RET finishes in 2020.



The only exceptions are large hydro and solar hot water (regardless of carbon price), and wind energy and building- integrated solar photovoltaics<sup>45</sup> (under the highest high carbon price scenario).

To prevent an industry collapse, it is recommended that a post-2020 'Safety Net' Renewable Energy Target be implemented to meet the cost shortfall between renewable energy costs and energy prices.

Table 1 above shows that a 2030 RET target of 169,000 GWh (which is equivalent to a percentage target of 53% of BAU) would avoid a stalling of the renewable energy industry post-2020, maximise the industry development in line with achieving 100% renewable energy by 2050 and accommodate electrification of the transport sector.

A low 2030 RET of 137,000 GWh (which is equivalent to a percentage target of 43% of BAU) is possible but it would defer renewable industry growth until after 2030 (see Table 2) which would require renewable industries to grow at close to their maximum plausible growth rate (30% per annum) after 2030 to deliver 100% renewable energy by 2050. This scenario carries very high risks of failure as there is no room for industry underperformance, and worse, could push companies onto financially vulnerable business development pathways.

**Table 2. 2030 Renewable energy targets when de-carbonised transport needs are included**

2030 Renewable electricity generation (TWh)	2030 RET using BAU electricity demand only	2030 RET with energy efficiency measures and transport electrification	Industry growth rate post-2030 required to meet 100% renewable electricity by 2050
169	53%	57%	20%
159	50%	53%	23%

<sup>45</sup> Conservative assumptions were made with respect to Solar PV, including (1) the SRES would end by 2020, and (2) forecasts were based on long-term learning rate cost reduction trends rather than short-term cost reduction phenomenon. Although continued fall in rooftop solar price would suggested that it could be competitive without a RET by 2020. See *Our Clean Energy Future* Report for more details.

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### **Band or weight the RET after 2020 to support resources concurrently**

The Climate Risk analysis finds that Australia's six main renewable energy sources need to grow concurrently to achieve 100% renewables by 2050, or risk some technologies having to grow at unsustainably high rates (greater than 30%) at later dates.

Current policies such as the carbon price and the current RET design favour low cost technologies first. Less commercially developed and currently more expensive renewable energy resources and technologies are less attractive to investors under the carbon price and the current RET scheme, however the present significant opportunity to provide low cost energy in the longer term.

WWF recommends the 'Safety' RET be banded or weighted with specific regulated targets/weights for each renewable resource and with a mechanism to phase-out each industry as it achieves cost convergence with the energy and carbon market.

Banding or weighting the RET will give less developed/more costly resources a leg up to develop and bring down their cost curves, alongside cheaper renewable resources and technologies.

Note that this is a 'technology neutral' approach as it does not specify the technology that is necessary to harness each resource.

This banding mechanism is also useful for economic efficiency as a means of phasing industries out of the RET as they become competitive in the open electricity market.

There is already some precedence with the current RET having two bands - one to support small-scale renewable energy and one band for large-scale renewable technology.

Unless the suggested changes are made to the RET, additional deployment mechanisms such as large scale feed-in-tariffs will be needed.

Transitioning to 100% renewable energy is necessary, desirable, technically achievable, affordable, and popular amongst Australian's.

The report, *Our Clean Energy Future*, shows that not only should the current 2020 RET target remain, but an increase in the RET out to 2030 will provide an important safety net to prevent a collapse in many renewable industries. It will also maintain renewable energy industry development until each achieves cost convergence with the energy and carbon markets.

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