



10 November 2016

**Submission to the Senate Environment and Communications References Committee  
inquiry into the retirement of coal-fired power stations**

**Key Recommendations:**

- Australia's commitments under the Paris Climate Agreement should provide the timeframe and carbon budget framework for a national coal retirement plan that replaces coal generation by 2035, and achieves net zero carbon pollution before 2050.
- The Leadership Forum on Energy Transition's blueprint: *Our Energy Future: A Plan to Transition Australia to Clean Energy*, details eight foundational actions that should form the basis of Australia's national plan to drive a clean energy transition.
- The barriers to coal closure need to be addressed through a national plan and associated policy.
- Ensure and provide support for Just Transitions for impacted workers and communities including through regionally based transition plans.
- The Climate Policy Review that the government committed to in 2017 should play a key role in determining the appropriate set of policies to manage the rapid transition to clean energy.
- Modernise the national electricity market and drive a transition to 100% renewable energy generation through a suite of policies that:
  - demonstrate government commitment to a thriving clean energy industry;
  - facilitate investment in the under-functioning energy market;
  - support emerging technologies;
  - trial new energy market and grid opportunities; and
  - support an expanded and growing clean electricity sector with 21<sup>st</sup> century regulation, grid infrastructure and access rules.
- Capitalising on energy efficiency is a necessary part of transitioning the energy sector and assisting low income households.

**Introduction: the imperative of global warming**

Australia and the world are already experiencing the impacts of global warming. This includes the heightened incidence of extreme weather including extreme heat, flooding and drought; increased occurrence and intensity of destructive bushfires; and unprecedented bleaching and mortality of coral reefs including our own Great Barrier Reef.



Australia's coal-dominated electricity sector is responsible for about one-third of the nation's carbon pollution (35.4%).<sup>1</sup> Use of dirty energy (e.g., including transport and industrial processes) lifts that contribution to over three-quarters, making generation and use of dirty energy Australia's number one driver of climate pollution.

Australia's use of coal for energy is responsible for making Australia the third highest carbon polluter per capita in the G-20, outdone only by Russia and Saudi Arabia. Due to Australia's dirty energy sector, every Australian is responsible for a greater impact on the global climate system than citizens of similar economies.

For example, the Max-Planck Institute for Meteorology has recently determined that it is possible to calculate how much Arctic sea ice is lost as the result of an individual's emissions. The average annual emissions of a citizen of the 35 rich nations in the Organisation for Economic Co-operation and Development (OECD) is 10 tonnes per year, leading to 30 sq m of ice being lost. Citizens of Australia have a much higher carbon footprint, resulting on average in each of us causing 50.7 square metres of sea ice loss per person per year. By losing Arctic sea ice, we are losing a very effective refrigerator and once this cooling effect is gone the [Greenland ice cap will melt much more rapidly](#) driving up sea levels. This is just one global 'tipping point' among others that is impacted by Australia's carbon pollution.

The current pace of global warming and its impacts have been well-documented. The premier global atmospheric tracking centre in the southern hemisphere in Cape Grim, Tasmania, just [recorded](#) a carbon dioxide reading of 404.42 ppm, which experts revealed is by far the highest reading during the past three glacial cycles stretching back over 400,000 years and also the fastest increase rate on record.

The Earth's climate has already crossed the half-way point to a global temperature rise of 2°C with over 1°C of warming since pre-industrial times already recorded. Scientists have warned that 2°C cannot be crossed if we are to avoid the dangerous tipping points such as accelerated release of methane from thawing permafrost and irreversible melting from the Greenland ice sheet.

The Bureau of Meteorology and CSIRO's *State of the Climate Report 2016* outlines variability and changes in Australia's climate, and how it is likely to change in the future. Their observations and climate modelling 'paint a consistent picture of ongoing, long-term climate change interacting with underlying natural variability.' Their findings are extremely relevant to the issue of coal closure and for that reason key points are outlined below. What's clear is that our climate is changing rapidly and Australia has a responsibility to quickly decarbonise.

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<sup>1</sup> National Greenhouse Gas Inventory available here:  
<https://www.environment.gov.au/system/files/resources/7c0b18b4-f230-444a-8ccd-162c8545daa6/files/nggi-quarterly-update-dec-2015.pdf> pg.7



### **Australia**

- Australia's climate has warmed in both mean surface air temperature and surrounding sea surface temperature by around 1 °C since 1910.
- The duration, frequency and intensity of extreme heat events have increased across large parts of Australia.
- There has been an increase in extreme fire weather, and a longer fire season, across large parts of Australia since the 1970s.
- May–July rainfall has reduced by around 19 per cent since 1970 in the southwest of Australia.
- There has been a decline of around 11 per cent since the mid-1990s in the April–October growing season rainfall in the continental southeast.
- Rainfall has increased across parts of northern Australia since the 1970s.
- Oceans around Australia have warmed and ocean acidity levels have increased.
- Sea levels have risen around Australia. The rise in mean sea level amplifies the effects of high tides and storm surges

### **Global**

- Global average annual carbon dioxide (CO<sub>2</sub>) levels are steadily increasing; they reached 399 parts per million (ppm) in 2015, and the annual value for 2016 is almost certain to be higher than 400 ppm. Current levels are likely the highest in the past two million years.
- 2015 was the warmest year on record for the globe since reliable global surface air temperature records began in 1880. The last 15 years are among the 16 warmest years on record.
- Globally-averaged ocean temperatures and heat content are increasing. Observations reveal this warming extends to at least 2000 m below the surface.
- Globally-averaged sea level has risen over 20 cm since the late 19th century, with about one third of this rise due to ocean warming and the rest from melting land ice and changes in the amount of water stored on the land.<sup>2</sup>

### **The health and local impacts of coal-burning power stations**

Coal-fired energy generation is dirty and while climate change is a central and critical concern, coal has further impacts on health and local communities. The historical dominance of coal generators is based on the low cost of cheap and plentiful fuel and low operating costs. However, this is only part of the picture, [ignoring the significant external](#)

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<sup>2</sup> BOM and CSIRO, State of the Climate 2016 available here: <http://www.bom.gov.au/state-of-the-climate/>



[costs](#) that these generators impose to human health, the environment, climate change and public infrastructure. These costs are also not distributed evenly across society, typically falling disproportionately on coal-dependent communities such as the [Latrobe Valley](#).

In addition to carbon dioxide, coal-burning power stations produce other dangerous air pollutants including nitrous oxides, sulphur dioxides and fine particulate emissions (PM2.5), all harmful to human health. No amount of exposure is without health risks, pregnant women and children are especially vulnerable, and residents living close to power stations suffer its effects disproportionately.

Estimated costs of health damages associated with coal combustion for electricity in Australia amount to \$2.6 billion per annum. The Climate and Health Alliance estimates the annual costs of [associated health damages](#) from the five coal fired power station in the Hunter Valley at around \$600 million per annum.

### **Leadership Forum on Energy Transition**

The Leadership Forum on Energy Transition, an initiative of the Australian Conservation Foundation and hosted by the UNSW recently delivered a blueprint to the federal government to drive a national transition to clean energy. The Leadership Forum included an unlikely coalition of 17 prominent people that included CEOs of energy companies, scientists, academics, economists, bankers, lawyers, conservationists, broadcasters and a former Governor General of Australia.

The blueprint calls on the federal government to lead a national energy transition plan to shift Australia to clean energy by engaging across parliament and with all levels of government, communities, workers and businesses. [The blueprint](#) addresses the many dimensions of closing and replacing Australia's coal-burning power plants, and details eight foundational actions that should form the basis of Australia's national plan to drive a clean energy transition:

1. Update the electricity market to speed up a clean energy transition
2. Facilitate and accelerate the inevitable closure of coal plants
3. Accelerate the uptake of clean energy and support the development of new technology
4. Create an attractive sustainable investment environment for clean energy
5. Ensure a just transition for communities and workers
6. Protect vulnerable Australians
7. Make Australia's buildings and businesses much more efficient users of energy
8. Dramatically reduce transport emissions



Each of these is relevant to the Committee's Coal Closure Inquiry. *Our Energy Future: A Plan to Transition Australia to Clean Energy* is linked above for the Committee's consideration and many of its recommendations are reflected in this submission.

### **Paris Agreement sets necessary timeframe for decarbonisation and coal replacement**

In December 2015, Australia became part of a universal, legally binding agreement to limit global warming to 1.5-2°C, achieve net zero emissions of greenhouse gases and increase resilience to the emerging impacts of climate change. Australia needs to plan for retirement of coal consistent with this commitment.

According to the Climate Action Tracker, to meet the federal government's Paris targets, emissions must fall 1.9 per cent annually on average. Instead, they are rising about 1.2 per cent a year. This is a clear indication that current climate policy is failing to achieve required pollution reduction.

Australia's initial target of 26-28 per cent pollution reduction on 2005 levels by 2030 is inadequate compared to other similar economies and compared to the actual goal of keeping global warming to 1.5-2°C. If other countries followed Australia's ambition it would lead to 3-4°C of warming above preindustrial levels.<sup>3</sup>

Australia's low target will need to be revisited in 2019-2020, at the latest. This will be required as part of the Paris Agreement, which includes a review process and intention to ratchet up ambition to meet the objectives of the Agreement. Achieving the goals of the Agreement will require countries like Australia to be at net zero emissions before 2050.<sup>4</sup> That will require achieving 100 percent renewable electricity, then electrifying transport, industrial processes and other energy uses to take advantage of clean electricity.

Analysis by The Climate Institute (TCI), which compared a range of scenarios for decarbonising the electricity sector, has found that under all scenarios consistent with limiting global warming to less than 2°C, Australia's existing coal fired generators need to be replaced with clean energy over the next 15-20 years.<sup>5</sup> More specifically, TCI found that Australia's coal fired power stations must close by 2035 to stay within a 1.5-2°C carbon budget.<sup>6</sup>

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<sup>3</sup> The Climate Institute, *COP22-Getting to Zero: Implementation of Paris Agreement for Net Zero Emissions*, Nov 2016.

<sup>4</sup> The Climate Institute, *COP22-Getting to Zero: Implementation of Paris Agreement for Net Zero Emissions*, Nov 2016.

<sup>5</sup> The Climate Institute, *COP22-Getting to Zero: Implementation of Paris Agreement for Net Zero Emissions*, Nov 2016.

<sup>6</sup> The Climate Institute, *A Switch in Time: Enabling the electricity sector's transition to net zero emissions*, April 2016, [http://www.climateinstitute.org.au/verve/resources/TCI\\_A-Switch-In-Time\\_Final.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_A-Switch-In-Time_Final.pdf)



### *The pathway for closure matters*

It is clear also that the pathway of this replacement is critical in terms of impacts on communities and electricity markets and prices. Delay will cause unnecessary market shocks and enormous problems for impacted communities. Using a carbon budget framework, TCI has concluded that Australia should reduce generation by 1,500 MW each year to smoothly phase out coal generation by 2035.<sup>7</sup>

### *Full replacement is technically doable and affordable*

Modelling by the Institute of Sustainable Futures (ISF) at UTS has also verified that a transition to 100 per cent renewable energy within one generation is technically feasible and economically responsible. These findings include that by 2035 Australia can power 100 per cent of homes and businesses with renewable electricity and around 40 per cent of transport needs. By 2050, the entire energy system can be decarbonised including transport, manufacturing and heating. This modelling therefore also confirms that coal-fired power can be phased out and replaced by 2030-2035 alongside a smooth and stable expansion of renewable energy.<sup>8</sup>

The Australian Energy Market Operator (AEMO) has also confirmed that the National Electricity Market can operate with 100 per cent renewable energy while meeting the current National Electricity Market reliability requirement.<sup>9</sup> In other words, 100 per cent renewable energy can meet the energy needs of the NEM 99.998 per cent of the time.<sup>10</sup>

The ACF is strongly of the view that climate and energy policy need to be integrated and that Australia's commitments under the Paris Climate Agreement provide the timeframe and carbon budget framework for a national coal retirement plan that replaces coal generation by 2035, and achieves net zero carbon pollution before 2050.

### **The state and expected life-span of Australia's coal-fired power plants**

Regardless of climate change, Australia needs to begin planning to replace aging and inefficient coal-fired power stations this decade.<sup>11</sup>

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<sup>7</sup> The Climate Institute, *A Switch in Time: Enabling the electricity sector's transition to net zero emissions*, April 2016, p. 1, [http://www.climateinstitute.org.au/verve/resources/TCI\\_A-Switch-In-Time\\_Final.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_A-Switch-In-Time_Final.pdf)

<sup>8</sup> GetUP! and Solar Citizens, *The Homegrown Power Plan*,

<sup>9</sup> Australian Energy Market Operation 2013, *100 per cent Renewable Study: Modelling Outcomes* accessed at <<https://www.environment.gov.au/system/files/resources/d67797b7-d563-427f-84eb-c3bb69e34073/files/100-percent-renewables-study-modelling-outcomes-report.pdf>

<sup>10</sup> Australian Energy Market Operation 2013, *100 per cent Renewable Study: Modelling Outcomes* accessed at <<https://www.environment.gov.au/system/files/resources/d67797b7-d563-427f-84eb-c3bb69e34073/files/100-percent-renewables-study-modelling-outcomes-report.pdf>

<sup>11</sup> The Climate Institute 2014, *Australia's Electricity Sector: Ageing Inefficient and Unprepared*.



Australia's coal-fired stations are some of the most polluting and least efficient in the world. Our aging fleet uses old, inefficient technology that is well past its use-by date; five of our generators are more than 35 years old and one was commissioned way back in 1964. By 2030 nearly half of Australia's existing coal-fired power stations will be 50 years old and the average age of the fleet will be over 40. They will be difficult and expensive to update and there is currently no cost-effective way of sequestering pollution – also known as carbon capture and storage – from even the most efficient plants.<sup>12</sup>

### **Electricity price and economic impacts of closing coal and investing in renewables**

Although investment will be needed to replace old coal generators and that will have a cost impact, renewable energy reduces wholesale electricity prices because once built they have no fuel costs.

Many analysts have confirmed that renewable energy brings down wholesale electricity prices. [Analysis from energy market experts ROAM Consulting](#) found that Australian households would pay over half a billion dollars more for power in 2020 without the Renewable Energy Target in place, and up to \$1.4 billion more per year beyond that.

Even the government's own modelling, conducted by ACIL Allen as part of the [Renewable Energy Target review](#), found that the average household electricity bill would be lower in the future with the target in place than without it. In addition, Australia's existing 23.5 per cent Renewable Energy Target is expected to cut electricity bills, unleash \$40.4 billion worth of investment and create 15,200 jobs.<sup>13</sup>

An excerpt from Melbourne Energy Institute's Report on renewables and merit-order dispatch pricing explains the impact of renewables on pricing:

“It is now well documented that the addition of significant renewable energy capacity into liberalised electricity markets puts downward pressure on wholesale market prices. This phenomenon, known as the merit order effect, is demonstrably impacting electricity wholesale prices in Australia and abroad.

There are several reasons such an effect might manifest. The addition of both supply and competition will naturally put downward pressure on wholesale prices. Without compensating withdrawals, the addition of more capacity into market will increase the capacity overhang, or the amount of capacity available above peak demand. Indeed this phenomenon is not particular to renewable energy - adding any new fossil or nuclear generation capacity will affect the market in a similar way, and is one of the reasons power purchase agreements (PPAs) are needed to finance new capacity build.

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<sup>12</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016.

<sup>13</sup> GetUP! and Solar Citizens, *The Homegrown Power Plan*



...because of its negligible short-run marginal cost, the impact of renewable energy generation on energy-only markets prices can be particularly acute and can lead to wholesale prices of zero or lower.

While distributed generation, such as rooftop solar PV, is generally not traded through central market dispatch systems, it is revealed to the market in terms of a reduced demand target. Rather than adding to the bottom of the supply curve, distributed generation subtracts from the demand curve. As with centrally dispatched renewable generation, the end result is that a lower marginal cost generator sets the dispatch price.

There are now numerous studies that have analysed the impact of renewable generation on merit order pricing, both overseas and in Australia.”<sup>14</sup>

The world is investing in renewable energy —e.g, \$28 trillion is expected to be invested globally in renewable energy and energy efficiency equipment by 2035, more than coal, oil and gas combined<sup>15</sup>— and as a result there are enormous opportunities available to Australia by committing to a more aggressive leadership role.

In 2015, 90 percent of new electricity generation worldwide came from renewable energy, the cost of solar PV dropped 80 percent over 5 years and wind turbines by a third. Wind power costs less than new build coal or gas. Rooftop solar is now cheaper than retail electricity.<sup>16</sup>

Finding based on ISF modelling and documented in *The Homegrown Power Plan* are instrumental in assessing costs and economic benefits of a transition to clean energy:

- “Decarbonising our entire energy system by 2050 means Australia gets a \$800 billion slice of the global renewables investment boom, and all the jobs that come with it.
- Investing more in renewables means spending less on fuel. Between now and 2050, the shift to renewables and increased energy efficiency delivers enough fuel cost savings to cover 110% of the bill for building 100% renewable power. Australia would save, on average:
  - \$9 billion a year on power sector fuel costs.
  - \$11 billion a year on transport fuel costs.
- On the path to a clean energy future, our investment in fuel-free electricity starts paying itself off in lower power prices as early as 2025, and by 2040 at the latest.”<sup>17</sup>

A recent International Energy Agency report showed that for the first time, clean energy made up more than half of the net electricity generation capacity added around the world

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<sup>14</sup> McConell and Sandiford, MEI, *Winds of Change: Analysis of recent changes in the SA electricity market*, Aug 2016.

<sup>15</sup> [BZE Renewable Energy Superpower Report](#), pg VI

<sup>16</sup> GetUP! and Solar Citizens, *The Homegrown Power Plan*

<sup>17</sup> GetUP! and Solar Citizens, *The Homegrown Power Plan*



last year. They have also predicted that capacity from renewable sources will grow faster than oil, gas, coal or nuclear power in the next five years.<sup>18</sup>

ACF and ACTU *Jobs for a Clean Energy Future* report shows strong, reliable and consistent policies to address climate change, cut pollution, prepare communities and drive the transition to clean energy can provide Australians with one million new jobs by 2040.

There is ample evidence that despite initial cost to replace old generators, which would need to be replaced regardless due to their age, health impacts and increasing operating and maintenance costs, there are significant price and economic benefits to be gained through a well-managed clean energy transition.

### **Remove barriers to coal closure**

Due to high exit barriers for coal generators, such as the cost of decommissioning and site rehabilitation, first-mover disadvantage and policy uncertainty, supply in the market has not adjusted sufficiently to match falling demand. In addition, closures are not occurring in a predictable and manageable way within an understood timeframe consistent with Australia's Paris commitments. Barriers need to be addressed to ensure smooth, manageable and sufficiently rapid closure.

Left to the market, we will continue to see closures just as we have already seen. Engie recently announced the closure of the aging Hazelwood power station in Victoria, making clear it was in response to a market with low wholesale electricity prices, falling electricity demand, and a company commitment to deal with climate change by phasing out coal-fired power stations. There have also been recent closures of power stations in Victoria (Morwell and Anglesea), WA (Worsley, Muja AB), SA (Playford B, Augusta), NSW (Redbank and Munmorah) and Queensland (Collinsville and Swanbank B).

However, there are many risks tied to unplanned, unmanaged closures including:

- sub-optimal pollution outcomes (the risk of less polluting plants closing first)
- energy security
- unemployment
- under-funded site rehabilitation costs<sup>19</sup>

### ***Overcapacity and falling demand***

The National Energy Market has 7,600MW of excess electricity capacity in the system, which represents approximately 16 per cent of total capacity.<sup>20</sup> While this figure will need

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<sup>18</sup> IEA, Medium-Term Renewable Energy Market Report 2016.

<sup>19</sup> Tim King, Institute for Energy Economic and Financial Analysis, *Subcritical Australia: Risks from Market Imbalance in the Australian National Electricity Market*, May 2016.

<sup>20</sup> King, T 2016, *Sub-critical Australia: risks from market imbalance in the Australian National Electricity Market*, Institute for Energy Economics and Financial Analysis, p.9.



to be adjusted once the Hazelwood Power Plant is closed on 31 March 2016, there will remain a significant excess capacity (Hazelwood generates up to 1600MW).

The reduction in electricity demand has been driven by a range of factors including growth in rooftop solar installations, increased energy efficiency; and a decline in energy intensive industries, particularly the aluminum sector.<sup>21</sup>

According to the Australian Energy Market Operator (AEMO), surplus generation capacity and flattening demand mean that no new generation is needed in the next ten years.<sup>22</sup> The Independent Market Operator in Western Australia has also declared that “no new capacity will be required in the South West Interconnected System until 2023-24”.<sup>23</sup>

Excess supply in the electricity market reduces the wholesale price of electricity. Reduced supply due to power station closure causes prices to go up and benefits the energy companies that are still operating. It therefore makes economic sense for coal-fired generators to wait for other companies to close and to hold closure or mothball plants until costs of maintaining their old facilities become higher than the money they can make running at a reduced rate.<sup>24</sup>

This increases the potential for disorderly or relatively sudden closure. This was the case for Alinta Energy which closed its coal-fired power station in South Australia in 2016 and Energy Australia which shut its Wallerawang operation in 2014.<sup>25</sup>

As the quotes from the Chief Executive of Engie in Australia below indicate, the recent announcement of Hazelwood closure in the Latrobe Valley also resulted from a decision about whether the plant was economic to operate.

“Hazelwood is now more than 50 years old. It has been a wonderful contributor to the National Electricity Market but we have now reached the point where it is no longer economic to operate,” Mr Keisser said.

“ENGIE in Australia would need to invest many hundreds of millions of dollars to ensure viable and, most importantly, continued safe operation. Given current and forecast market conditions, that level of investment cannot be justified.

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<sup>21</sup> Tim King, *Australia's East Coast Electricity Grid is Over Dependent on Sub Critical Coal and in Need of Reform*, May 2016.

<sup>22</sup> AEMO, No New Power Generation Needed for next 10 Years, Media Release, 8/8/14 2

<sup>23</sup> Climate Energy Council 2014, *Australia's Power Generation Sector at Crossroads*, p.3

<sup>24</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016.

<sup>25</sup> <http://reneweconomy.com.au/2014/lights-out-at-1gw-wallerawang-coal-fired-power-station-27956> , <https://www.alintaenergy.com.au/about-us/news/augusta-power-station-ceases-generation>



### *Decommissioning and rehabilitation*

Decommissioning power stations and rehabilitating their associated mines is expensive. It is economically beneficial for plant owners to delay the realisation of this liability, which further incentivises ‘mothballing’ over permanent closure.

The above risks need to be addressed with an orderly coal phase-out plan that allows stakeholders to prepare for the inevitable transition to a cleaner electricity system. In addition, a federal plan and associated policies are needed to bolster mine rehabilitation securities from liable companies so there is sufficient funding and capacity to fully decommission and restore affected sites.

### **Need for a national plan**

Because much of Australia operates with an interconnected National Energy Market, a coherent national plan is essential to ensure a smooth but rapid transition away from coal power generation. This will require coordination across all levels of Government and many different agencies and regulators, with significant participation from community stakeholders, to ensure it is done efficiently and fairly.

“The national plan needs to establish rules, policies, regulations, markets and a basis for investment that will power the transition. These principles and the structures that flow from them must be enduring if they are to be effective and they must be founded upon the notion of a just, fair transition for workers, businesses and communities. They must set up Australia to prosper from the innovation and services that come with the clean energy transition.”<sup>26</sup>

### **Policy mechanisms having regard to 'Paris Agreement' commitments**

Modelling commissioned by The Climate Institute considered a range of policies to achieve emission reductions by the electricity sector consistent with achieving the goal of keeping global warming at less than 2°C. They found that a modest carbon price rising to \$40 per tonne by 2030 would produce emission reductions similar to the government’s current national 2030 target of 26-28 per cent below 2005 levels, but this would not be sufficient alone to drive replacement of coal burning power stations.<sup>27</sup>

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<sup>26</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016

<sup>27</sup> The Climate Institute, *A Switch in Time: Enabling the electricity sector’s transition to net zero emissions*, April 2016, p. 1, [http://www.climateinstitute.org.au/verve/resources/TCI\\_A-Switch-In-Time\\_Final.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_A-Switch-In-Time_Final.pdf)



In addition, TCI found that 98 per cent of the sector's 30-year carbon budget would be used up in the first ten years. That would leave a massive task after 2030 with more than 80 percent of the coal-fired generation fleet needing to be closed in less than five years.

A key conclusion of this work is that “measures that directly target an orderly phase out of high-carbon generation over the next 15-20 years and de-risk clean energy investment would smooth the sector's emission reduction pathway and reduce the risks of disruptive adjustment in the future.”<sup>28</sup>

Numerous policy options exist for government to drive a successful, planned and well-managed transition of our electricity market. These include;

- a) A market mechanism for regulated closure of highly emissions intensive power stations, such as that proposed by Jotzo and Mazouz (2015)<sup>29</sup>.
- b) Introduction of an emissions intensity standard for power stations that tightens over time, ensuring the dirtiest coal-burning power stations are closed first.
- c) Introduction of an age-based regulation that tightens over time and ensures the oldest (and therefore largely least-efficient) power stations are closed first.
- d) Other similar proposals or combinations of the above.

Policy proposals including the Jotzo and Mazouz (2015)<sup>1</sup> model are important ‘first mover’ options insofar as they will likely perform best in incentivising the shutting down of the initial one or two generators. However, supporting regulation will be needed to facilitate the closure of the many other coal-fired generators. Regulatory measures could include tightening emissions standards or mandated closure ages. Working in tandem, these policy instruments can ensure the most competitive bidding process in the initial offer to shut-down, while also signalling to other operators who stay in the market that they will eventually be phased-out over a certain time period. Such policy proposals could also be used to raise funds for worker and community transition plans. In the case of the Jotzo and Mazouz proposal, a further advantage is that site rehabilitation costs can be built into the closure price.

### *Climate Policy Review 2017*

The Climate Policy Review that the government committed to in 2017 should play a key role in determining the appropriate set of policies to manage the rapid transition to clean energy. There are multiple concerns about the current Direct Action plan, which is currently not set up to achieve Australia's Paris commitments, or to manage the energy transition. It's critical that energy and climate policy are integrated in the review and the

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<sup>28</sup> The Climate Institute, *A Switch in Time: Enabling the electricity sector's transition to net zero emissions*, April 2016, [http://www.climateinstitute.org.au/verve/resources/TCI\\_A-Switch-In-Time\\_Final.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_A-Switch-In-Time_Final.pdf)

<sup>29</sup> Jotzo, F and Mazouz, S. Nov 2015. *Brown coal exit: a market mechanism for regulated closure of highly emissions intensive power stations*, [https://ccep.crawford.anu.edu.au/sites/default/files/publication/ccep\\_crawford\\_anu\\_edu\\_au/2015-11/ccep1510\\_0.pdf](https://ccep.crawford.anu.edu.au/sites/default/files/publication/ccep_crawford_anu_edu_au/2015-11/ccep1510_0.pdf)



resulting policy provides certain, durable settings that provide strong signals for business and industry.

**Need to ensure and provide support for Just Transitions for impacted workers and communities**

A successful and just transition must ensure communities are given the time and resources to determine their economic future, in consultation with governments. This should include a genuine and honest conversation as early as possible between communities, companies that operate generators and all levels of government. Together, these groups should make regional plans to help communities and people who lose their jobs in the transition with appropriate financial resourcing. The plan should be specific for each region and its needs, not 'one size fits all.'<sup>30</sup>

Early engagement with local communities and workers, other levels of government and coal power station operators is needed to establish and fund regionally-based transition plans. This should be assisted by establishment of an independent body to represent the interests of consumers, communities and workers in the discussion and development of transition plans.

Regionally based transition plans should include:

- Transition assistance: including financial resources to help people retrain and, if necessary, relocate.
- Economic diversification: accelerate new industry in impacted areas enabling investments for regions affected by coal closure years before coal-fired power stations are scheduled to close.
- Community collaboration: input from all stakeholders including workers, community representatives, unions, industry and government. The government should also maintain ongoing support for community services and functions.<sup>31</sup>

**Modernise the national electricity market and drive 100% renewable energy generation**

A long-term target for renewable energy is fundamental to ensuring investor certainty and driving confidence. A target for clean renewables to power 100 per cent of Australia's electricity by 2035, and 100 per cent of all Australia's energy (electricity, transport and industrial processes) by 2050 is achievable and affordable.

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<sup>30</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016.

<sup>31</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016.



Global renewable energy investment surged 19 per cent in 2014, to reach \$318bn. In 2015, global investment hit \$328.9bn and incurred its biggest annual increase. However, at the same time, uncertainty about government support for renewable energy in Australia meant further declines in the industry here. Employment in renewable energy in Australia declined three per cent from 2013-14 to 2014-15 while global renewable energy jobs increased to 8.1 million.

A suite of policies from the federal government will be required to:

- demonstrate government commitment to a thriving clean energy industry;
- facilitate investment in the under-functioning energy market;
- support emerging technologies;
- trial new energy market and grid opportunities; and
- support an expanded and growing clean electricity sector with 21<sup>st</sup> century regulation, grid infrastructure and access rules.

The following policies should be pursued to ensure that Australia is able to harvest the opportunities from the best and most abundant natural resources we have – clean energy.

*a) Commit to an expanded and flexible RET of 100% out to 2035*

An expanded RET will continue to play an important role supporting a suite of technologies, by providing a long-term goal that signals to investors the pathway of renewable energy growth.

*b) Introduce national renewable energy capacity auctions within the expanded RET*

To ensure there is a secure mix of different technologies to meet Australia's energy needs, additional measures may be needed to complement the least cost approach of the RET. Reverse auctions can be used to support the build of specific technologies in specific geographies to ensure the integrity of the grid at lowest cost.

The ACT's wind and solar reverse auctions have been used to deliver the ACT's 100% renewable energy target which has been advanced to 2020 and is on track for delivery. This mechanism has helped deliver new renewable energy capacity at record prices including the most recent auction for wind power that resulted in the Hornsdale wind farm contract being struck at a fixed price of \$73/MWh for 20 years. Factoring in the 20-year fixed price, the bid equates to a price of around \$57/MWh, a record low for Australia.

To contribute to the 100 per cent RET target, RECs equivalent to the amount of renewable energy created via the reverse auction would be retired from the RET.

*c) Maintain and strengthen ARENA and the CEFC*



ARENA and the CEFC have played an essential role in facilitating the development and commercialisation of renewable energy projects in Australia. ARENA recently incurred a \$500m budget cut after an attempt to remove \$1.3B. Commitment to the ongoing funding and grant-making function of ARENA is needed.

**d) *Kickstart community power***

Resource community efforts to build clean renewable energy in towns and suburbs across Australia. While community power projects would be eligible for RECs, upfront capital costs are usually the biggest barrier. Government could help drive the growth in community renewables by establishing a community project registry, provide free project advice, information about finance options including CEFC support, green bonds or government provided tax incentives.

**e) *Household and business uptake***

According to the Electricity Supply Association of Australia, Australia has the highest rate of household solar panel installation in the world, with 15 per cent of Australian homes having solar on their roofs. Yet the space for growth in this market and in the SME market remains significant, delivering households and businesses savings and job growth opportunities in towns and suburbs across the country.

- Set a target for the number of solar PV rooftops to drive greater investment certainty
- Continue the Small Scale RET Scheme (SRES)
- Install solar PV on all new and existing public housing stock

**f) *Build up Batteries***

- Establish a mechanism to reward distributed generators (households and businesses) for the full value of distributed electricity exported to the grid. This would include smart integration of distributed generation, storage and centralised generation as well as smart network connected appliances and electric vehicles<sup>32</sup>.
- Ensure the development of minimum standards for new battery storage technologies. The recent COAG Energy Council decision to commission consultation papers focused on consumer protections are a welcome first step.
- Introduce standards to require new government buildings to include minimum requirements for battery storage capacity.

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<sup>32</sup> Clean Energy Council, 2016. *Accelerating the uptake of Battery Storage*.  
<https://www.cleanenergycouncil.org.au/news/2016/March/battery-storage-blueprint-accelerating-uptake.html>



- Support consumer awareness campaigns which guide consumers on the available technologies, appropriate installation and ongoing operation of battery systems<sup>33</sup>.

**g) *Reboot the market, gear-up the grid***

The current design of the National Electricity Market (NEM) is ill-equipped to facilitate the deployment or integration of new technologies such as large-scale or distributed renewables, or to support energy efficiency. The current operation of the NEM is also acting as a barrier to the adoption of modern, clean technology sources. The legislated objectives of the NEM require review and reform to properly facilitate the energy transition needed in Australia.

Alignment of rules, regulations, laws, institutions (AEMO, AEMC, COAG Energy Council) and market structures with a new set of objectives around a clean energy transformation is needed. This should include:

- Commitment and initiation of a process to update the National Electricity Objective.
- Modernising national electricity market design including demand management incentives, storage, role of networks in the transition to a clean energy system, grid access guarantees, and local energy trading.
- Low-income friendly tariffs and pricing.

We need objectives that can drive the clean energy transition through the day-to-day actions of all organisations and individuals involved in electricity delivery in Australia, from the Federal government and the COAG Energy Council down to the smallest solar provider and everyone in between - regulators, rule makers, market operators, retailers, network companies, commercial and household solar producers/consumers, and so on.

The commitment at the last COAG Energy Council meeting to better align climate and energy policy is not possible without a change to the National Electricity Objective (NEO). Currently, the Australian Energy Market Commission (AEMC), the Australian Energy Regulator (AER) and AEMO cannot consider the environmental implications of critical decisions such as rule changes and network pricing determinations. This must change as a matter of urgency and the best way to do this is through changing the NEO.

**Energy efficiency is a key pillar in energy transition**

Capitalising on energy efficiency is a necessary part of transitioning the energy sector. Energy efficiency measures offer some of the cheapest forms of carbon abatement, and can in many cases be cost negative. However, information, regulatory and other barriers often get in the way of energy efficiency activities.

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<sup>33</sup> Ibid.



Priority policy interventions to take advantage of the wealth of opportunities should be identified and initiated including:

- a target to at least double Australia's Energy Productivity by 2030;
- improve minimum standards for appliances over the next 5 years;
- improve performance standards for buildings;
- mandatory disclosure at point of sale or lease by 2018;
- a comprehensive program to pursue Energy Efficiency of government buildings and operations;
- harmonise Energy Efficiency schemes across the country, and extend to all states and territories.

In addition, energy efficiency must be part of assisting low income households adjust to the energy transition. Specific recommendations include:

- Set regulated minimum energy efficiency standards for social and private rental housing;
- Increase funding for household energy efficiency schemes that give low income residents and landlords access to grants or discount finance to invest in energy efficiency improvement and clean technology;
- Help people with low incomes to adjust to the energy transition by providing additional financial assistance where necessary.<sup>34</sup>

**For more information:**

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*The ACF community speaks out for a healthy environment, Australia's special places, climate action and for lasting social and economic change.*

[www.acfonline.org.au](http://www.acfonline.org.au)

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<sup>34</sup> The Leadership Forum on Energy Transition, *Our Energy Future: A Plan to Transition Australia to Clean Energy*, Nov 2016.