CLIMATE COUNCIL

ENERGY COMMUNICATIONS GUIDE 2018

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1. Introduction

The Climate Council is Australia's leading climate communications organisation, a not-for-profit working to provide the latest climate science and solutions information to Australians, journalists and policymakers. To date, the Climate Council has produced more than 80 scientific reports and communicated climate science and energy information in the form of more than 20,000 media items across the nation, and around the world.

Over the past decade, public concern and general understanding of climate change has grown, especially as more and more Australians witness or are personally affected by extreme weather events, including heatwaves, supercharged storms, cyclones, heavy rainfall, flooding and drought, along with more severe bushfire seasons. Despite this rise in public understanding, the climate communications challenge remains just as important as ever, as Australia continues to grapple with the complexities surrounding the national transition from ageing, inefficient and polluting fossil fuel power stations (such a coal and gas) to a zero-emissions future. The existence of strong climate and energy policy in Australia has never been more important, and with Australia's electricity sector the nation's biggest polluter, continuing the transition to clean energy remains the biggest opportunity to tackle climate change in our own backyard.

Energy has become one of the biggest hot button political issues, not only in federal politics but also for state governments across Australia with energy expected to be a key issue in several upcoming elections. The Federal Government's framing around the energy debate has revolved around energy security or 'keeping the lights on', skyrocketing electricity costs and incorrectly blaming issues in these areas on the speed of Australia's transition to renewable energy.

However, an increasing number of Australians are becoming engaged in Australia's climate and energy policy debate, with a recent 2018 Lowy Institute poll showing 84% of those surveyed believed the government should focus on renewables, even if this leads to investing in infrastructure to increase the reliability of the national energy grid. In the same poll conducted in 2017, this figure has risen from 81% (Lowy Institute, 2018).

Energy in Australia is a complex beast. The energy sector is typically riddled with obscure industry jargon, from 'baseload', 'dispatchable power' and 'load shedding', to the intricate supply and demand operations of the National Electricity Market (NEM).

This guide has been created to assist those communicating on climate change and energy to do so accurately and effectively. It includes some clear definitions of climate and energy concepts delivered in a manner that is widely understood by the public, and in messaging that is easily received. This guide includes advice on communicating the complex aspects of the energy debate, including the role of coal, gas and renewable energy and energy storage in relation to greenhouse gas pollution and efforts (or lack of) to effectively tackle climate change

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2. Background: The Australian Energy Debate

The national energy debate continues to dominate political discussion in Australia, a debate amped up in response to the statewide electricity blackout in South Australia in September 2016, which occurred as a result of an unprecedented one-in-50 year extreme weather storm event. This supercharged storm caused 22 transmission towers to topple, resulting in a total statewide blackout (Climate Council 2016a).

Throughout 2017, the Federal Government made a series of energy announcements, many involving continued or greater reliance on coal and gas. These measures included reaching an agreement with gas producers to ensure there is enough domestic supply (ABC 2017a), calls to extend the life of the ageing Liddell coal power station (ABC 2017b), support for the construction and rollout of carbon capture storage technology or 'clean coal', the construction of new large-scale pumped hydro by expanding the existing Snowy Hydro power station (also known as Snowy

Figure 1: Severe storms in South Australia brought down transmission towers in 2016.

2.0) (Snowy Hydro Limited 2018) and pressuring state and territory governments to lift moratoriums on unconventional gas exploration (Saddler et al 2017).

In contrast, state and territory governments instead ramped up Australia's transition away from fossil fuel generation in 2017, instead looking towards renewable energy and battery storage technology to reduce prices and greenhouse gas pollution levels, while maintaining reliability. Queensland, Victoria, Tasmania and the Northern Territory have all set Renewable Energy Targets. States and territories rolled out a range of new programs and initiatives to support the construction of more renewable energy including new wind, solar and storage projects (Climate Council 2017a).

South Australia established itself as a leader in renewable energy and battery storage, with high levels of rooftop solar, strong renewable energy targets and policies, and switching on what was the world's most powerful lithium-ion battery at the time, generating domestic and international buzz amongst the public and widespread media attention. In addition, the South Australian Government moved quickly to announce the construction of Australia's largest, cheapest-to-date solar thermal power plant, which can generate clean and reliable electricity around the clock (Climate Council 2017a). The Australian Capital Territory (ACT) is also leading the transition to renewable energy, with bipartisan support for its 100% renewable energy target. The ACT has put in place contracts with wind and solar farms to ensure it will achieve its target by 2020.

Queensland and Victoria initiated large-scale auctions designed to contract lowest cost renewable energy towards meeting state targets. Meanwhile, industry made record investments in wind and solar throughout 2017. This record investment has set Australia on track to surpass its 2020 Renewable Energy Target of 33,000 gigawatt-hours of renewable energy (equivalent to about 23.5% of Australia's electricity generation) (Clean Energy Regulator 2018).

Figure 2: South Australia's 'big battery', built by Tesla in just under 6 months, was operational by the start of December 2017.

The Finkel Review outlined 50 recommendations for the future of the electricity sector in a bid to increase security, ensure future reliability, address energy prices, and reduce greenhouse gas pollution.

Federal climate and energy policy in 2017 was dominated by the Chief Scientist Dr Alan Finkel's review of the National Electricity Market, which was issued in June 2017. The Finkel Review outlined 50 recommendations for the future of the electricity sector in a bid to increase security, ensure future reliability, address energy prices, and reduce greenhouse gas pollution (Finkel 2017).

In addition, the Finkel Review stressed the importance of system planning and action to ensure the right combination of new power supply is delivered in each region, in a timely way to achieve an orderly industry transition. Federal, state and territory energy ministers agreed to 49 out of the 50 Finkel Review recommendations (COAG Energy Council 2017). The one outstanding recommendation - for a Clean Energy Target - was not adopted due to opposition by the Federal Government (ABC 2017c). With 49 Finkel Review recommendations addressing security, reliability and affordability now

Figure 3: Treasurer Scott Morrison holds a lump of coal in Federal Parliament.

adopted, one outstanding issue remains. Australia continues to lack an enduring, credible, national policy to reduce greenhouse gas pollution overall and particularly from the electricity sector.

The Federal Government has since proposed a climate and energy policy known as the National Energy Guarantee (NEG). This policy was established in conjunction with the Federal Governments appointed Energy Security Board (ESB).

The Federal Government's Australian proposed NEG includes a woefully inadequate target of cutting Australia's greenhouse gas pollution levels in the electricity sector by 26% to 2030 (on 2005 levels). Under the NEG, this target would be locked in place through to 2030 and require five years notice for any future changes beyond 2030. This proposed policy is completely inadequate in terms of achieving the greenhouse gas pollution cuts required to tackle climate change and limits the ability to ratchet up pollution cuts in coming years. The NEG also risks strangling the renewable energy policies of state and territory governments. As currently proposed, the NEG would effectively set an upper limit on state and territory government action on renewable energy, with the Federal Government stating these policies would be able to contribute to the NEG's emissions target.

The Climate Council has created a climate and energy policy roadmap outlining 12 key principles that are essential to tackling climate change in Australia.

'Clean and Reliable Power: Roadmap to a Renewable Future'.

Figure 4: Energy Security Board Panel.

3. The Golden Rules of Communicating Energy

1. THE PROBLEM IS HAPPENING NOW, NOT TOMORROW

Climate change is happening here and now, with its impact being felt and experienced through rising temperatures and extreme weather events around the world and here in Australia. It is human nature to consider climate change as a 'future problem' that is not immediately concerning or relevant. However, it is important to show your audience that climate change is happening today and it is a problem that poses a real threat to their lives and livelihoods that must be prioritised and dealt with now.

In climate communications it is vital to clearly express and identify how we are experiencing climate change today, such as record-breaking summers and winters, severe heatwaves, supercharged storms, and more intense bushfire seasons (Climate Council 2018a). Australians especially are more frequently witnessing the impact of climate change through extreme weather events and providing this link, helps to clearly communicate that this is a problem we are facing today in our own backyards.

Clearly contextualising that human life is placed at risk during such extreme weather events also highlights the importance of acting on climate change solutions in order to protect Australians today and for future generations to come.

Climate change is happening today and it is a problem that poses a real threat to Australian lives and livelihoods that must be prioritised and dealt with now.

2. FOCUS ON ENERGY SOLUTIONS AVAILABLE NOW

Renewable energy and battery storage technology are climate change solutions that are here and available now. Renewable energy and battery storage are clean, affordable and reliable solutions that are reducing greenhouse gas pollution as they continue to be rolled out here in Australia and around the world.

It is important when communicating on solutions such as renewables and storage that they are not framed as a far-off, next generation possibility. Phrases such as 'renewables are the energy of the future' actually suggest that renewable sources of power are a future solution, rather than available today (Climate Council 2017b).

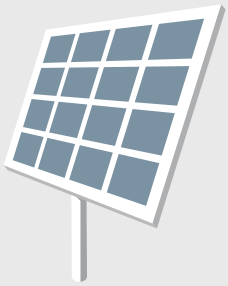
Instead, describe renewable energy and storage examples to your audience that already exist. This includes rooftop solar installations, specific solar or wind farms and even the construction of batteries (such as the South Australian Big Battery).

It is crucial that renewables and storage are accepted and understood to be climate change energy solutions that are available today, right now, rather than a future concept.

Figure 5: Different forms of renewable energy.

SOLAR

The sun's energy is converted into heat to drive steam turbines, generating electricity (solar thermal) or converted directly into electricity by solar cells (solar PV).



BIOENERGY

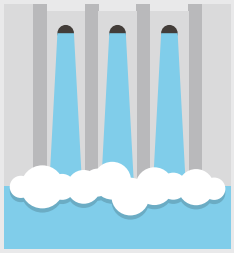
Energy is derived from organic matter (recently living plant or animal material), such as sugarcane waste, landfill gas and algae.

WIND

Wind turns the blades of a wind turbine to generate electricity.

HYDRO

Flowing water turns water turbines to generate electricity.



3. HIGHLIGHT THE BENEFITS OF RENEWABLES AND STORAGE

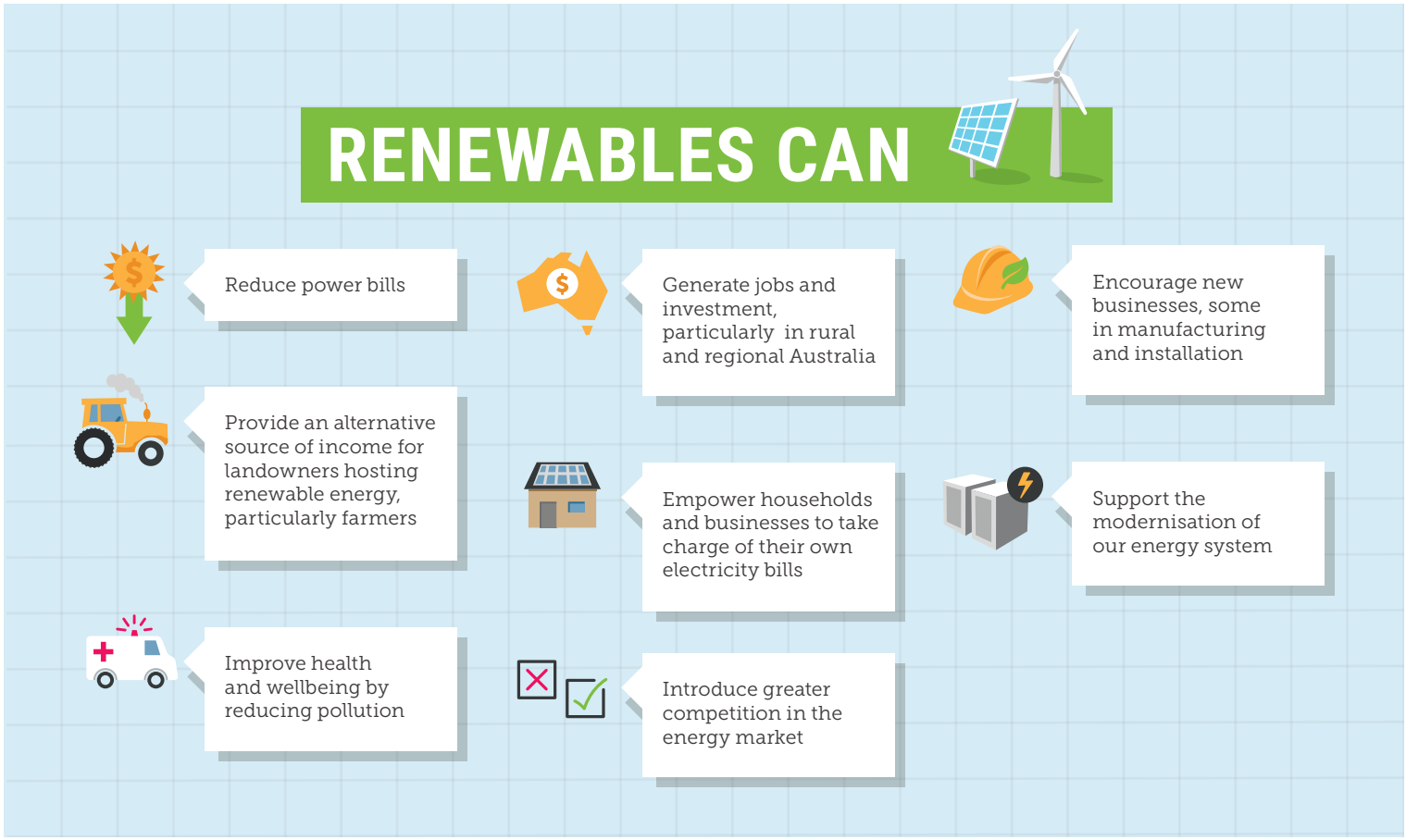
It is human nature to be more interested or invested in something when it directly affects you, whether it's negatively or positively. Communicate to your audience the many ways that renewable energy and battery storage is benefiting people and industry in Australia, beyond what their conceptions may be.

People, businesses and organisations are benefiting from renewable energy and battery storage today. Renewable energy is popular partly because it provides many benefits - emphasising the multiple benefits of the technology gives greater context and reason for the transition from fossil fuel generation to renewable energy. For example, benefits include local investment and jobs, cutting household and business power bills, creating new industries, modernising the power system, improving health and supporting regional communities (Figure 6).

In fact, ReachTel polling commissioned by the Climate Council in September 2017 showed three quarters of Australians expect household batteries to become commonplace within ten years and over half expect large-scale batteries to be commonplace within the same timeframe (Climate Council 2018c).

Communicating in simple terms the benefits of renewable energy and battery storage is all that is required to highlight the energy solutions. A phrase such as 'renewable energy and battery storage is clean, affordable and reliable' is a much more convincing argument compared to simply saying that renewable energy technology exists and is good for the environment.

Figure 6: There are a range benefits that renewable energy brings, including lowering power bills, creating jobs and generating investment.



4. PAINT A CLEAR PICTURE OF THE FUTURE

When Australians think of sources of renewable energy they often only think of rooftop solar. Understanding that renewables and storage are big enough and powerful enough to generate electricity to supply major industries and the National Electricity Market non-stop or 24/7, demonstrates the true potential and scale that this technology can operate at.

Audiences need greater exposure to large-scale renewable energy and energy storage solutions to understand that bigger solar and wind farms plus batteries means clean, reliable and affordable electricity, every minute of the day.

Renewables and storage are powerful enough to generate electricity to supply the National Electricity Market non-stop or 24/7.

5. GIGAWATTS AND MEGAWATTS ARE *TURNOFFS*

Using energy jargon to relay how powerful a battery is or how much energy capacity a renewable energy source has can quickly lose meaning or alienate an audience who may not be familiar with such technical terms. For most people, a gigawatt doesn't really mean anything and its energy value is unclear, so it is vital that you give an understandable equivalent in order for audiences to make sense of the information you are trying to convey.

For example, an understandable comparison for 1 gigawatt of wind power would be to explain that this energy generation is powerful enough to provide electricity for around 500,000 Australian homes. Painting a picture for your audiences in this way means there is clear communication in explaining exactly how powerful the energy source is - without being an expert on gigawatts, megawatts and kilowatts. Another example is to convey the physical size of a project in number of solar panels or wind turbines.

6. SHOW EXAMPLES OF THE TRANSITION ALREADY UNDERWAY

The transition to clean, affordable and reliable renewable energy and battery storage is more tangible and reassuring when there are already existing examples and case studies of where the technology has been successfully used. Humans by nature fear the unknown and resist change, so in order to move past such concerns, it is crucial to focus on examples where something has worked or been successful already in a relatively comparable context.

For example, California in the United States is on track to supply more than 50% of its electricity from renewable energy sources such as wind and solar (California Energy Commission 2017). While in business, Apple has shifted its entire global operations to 100% renewable energy - now that's innovation (Apple 2018).

In addition, local examples are also beneficial in demonstrating progress already underway in Australia. For instance, the following statement creates a picture in Broken Hill.

"The Broken Hill solar farm has 670,000 solar panels and is generating power in the desert. Just imagine! It can power tens of thousands of homes and has created about 150 jobs in the community thanks to its construction."

"The Broken Hill solar farm has 670,000 solar panels and is generating power in the desert. Just imagine! It can power tens of thousands of homes and has created about 150 jobs in the community thanks to its construction."

7. CONNECT THE PROBLEM WITH THE SOLUTION

As the pace of transition increases and complications arise, it becomes even more important to connect the problem (worsening climate change and extreme weather events) with the solution (renewable energy and battery storage).

We need to keep reminding Australians of why we're undertaking this important transition: to protect Australians from worsening heatwaves, supercharged storms, droughts and bushfires.

Figure 7: Monitor in use at Mt Riverview, 20 Oct 2013.

8. TO NEGATE A MYTH IS TO REINFORCE IT

Repeating the opposition's message, even while trying to dispel it, does nothing but reinforce the very same message in the mind of your audience. As George Lakoff said, *'Don't think of an Elephant!'* and what do we do? When you are discussing renewable energy and climate change, the same logic should apply.

For example, attempting to refute the Federal Government's message that 'renewables aren't reliable because sometimes the sun isn't shining and the wind isn't blowing' by saying 'it's not true to say that renewables aren't reliable because the sun isn't shining and the wind isn't always blowing, because batteries or energy storage can provide energy on demand' reinforces the negative myth that the Federal Government is trying to promote.

It is better to instead deliberately ignore the negative messaging and move straight to the positive, saying 'renewables coupled with battery storage are reliable and can provide electricity on demand, 24/7. Australia is one of the sunniest and windiest nations in the world, so solar and wind energy just makes sense.'

Australia is one of the sunniest and windiest nations in the world, so solar and wind energy just makes sense.

9. PLANTS VS STATIONS

Recent messaging research by Sunrise and the Climate Action Network Australia has shown that the term 'power plant' should be avoided in climate and energy communications. This is because 'plant' can be associated with positive, environmentally friendly and organic connotations. Fossil fuels, such as coal and gas generators are always polluting and should instead always be referred to as 'power stations'.

Figure 8: The Loy Yang A power station in Victoria. Coal power stations should not be called "power plants" as this can have positive connotations.

In contrast, it would be acceptable to refer to renewable energy technology such as solar and wind developments as 'farms' and 'solar plants', as this supports our framing.

Figure 9: Wind and solar developments can be called 'wind and solar plants' or 'farms' as this supports our framing.

10. ALWAYS CLEAN, AFFORDABLE AND RELIABLE

Renewable energy and storage technology is clean, affordable and reliable. These are accurate descriptions that should always accompany your messaging when referring to Australia's transition away from the contrasting messages relating to fossil fuels (coal and gas) which are ageing (except when referring to new coal or gas), polluting and inefficient.

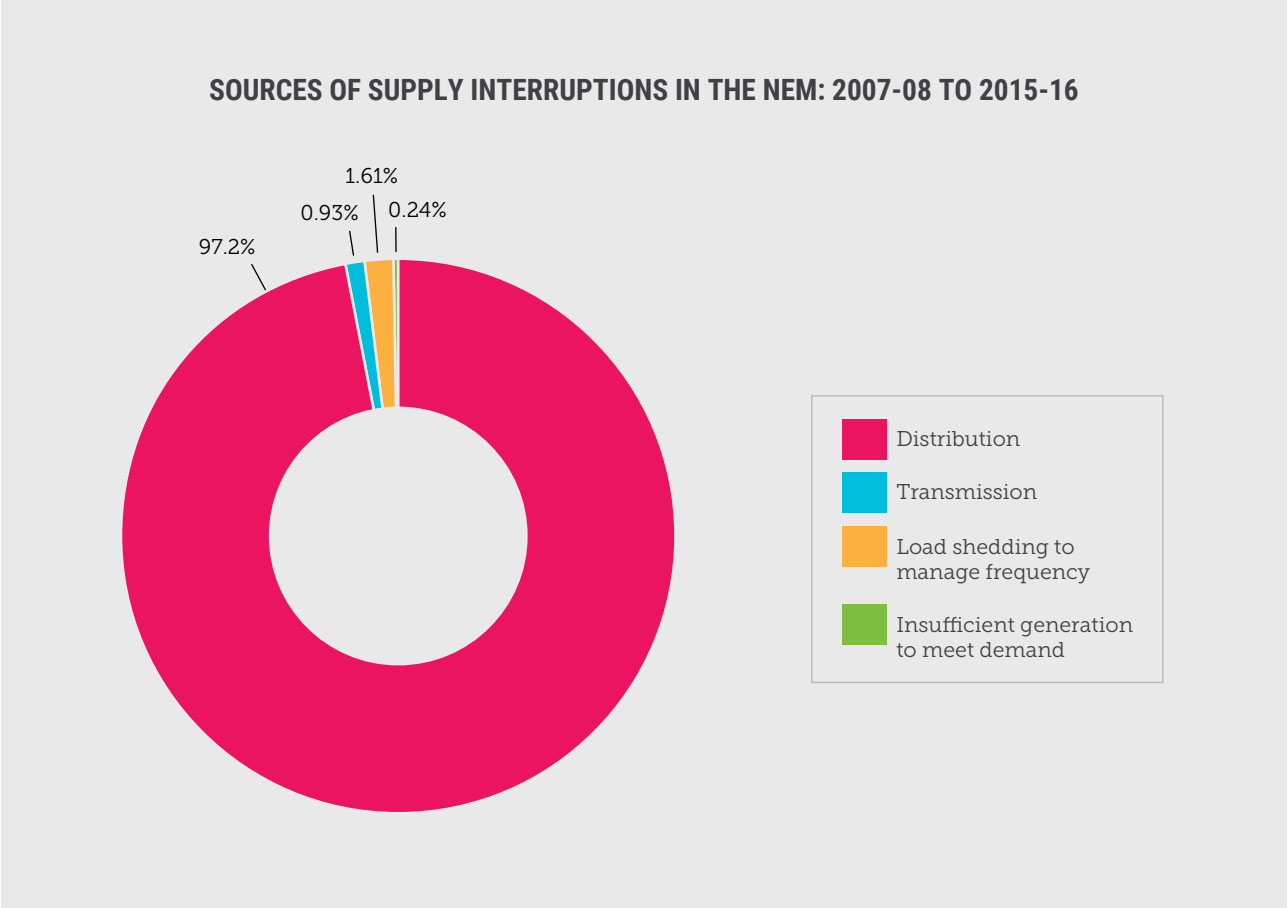
Renewable energy and storage technology is clean, affordable and reliable.

11. STOP USING 'BASELOAD'

Baseload is a common buzzword used to incorrectly imply that renewable energy is not capable of providing a reliable supply of electricity. Renewables plus energy storage can provide electricity across Australia on-demand, 24/7. Baseload is an innaccurate and outdated concept that does not reflect the needs of a modern, flexible and efficient electricity system.

In addition, Australia's electricity is highly reliable. When power supply is interrupted, this is overwhelmingly due to events affecting powerlines and electricity distribution. 99% of all interruptions to power supply, including blackouts, are caused by events affecting distribution and transmission power lines and security events - not a lack of sufficient generation. Common causes of blackouts include fallen tree limbs, possums, vehicle impacts, bushfires, lightning strikes and storms. And to make matters worse, climate change - driven by the burning of coal, oil and gas for electricity - is worsening many extreme weather events such as storms, heatwaves and bushfire weather.

Figure 10: Distribution issues have been the overwhelming source of supply interruptions over the past decade.



Source: Adapted from AEMC 2018.

12. RENEWABLES & ENERGY EFFICIENCY GO HAND IN HAND

Couple renewables with energy efficiency measures as climate solutions. Switching sources of energy, as well as using power in smarter ways are both critical solutions to tackling climate change. Increasing energy efficiency also saves money for businesses and households alike.

4. Communicating on Renewables

As one of the sunniest and windiest nations in the world, Australia has significant opportunities when it comes to renewable energy. Renewable energy coupled with energy storage is a natural partnership that is the ideal fit for the Australian landscape and climate.

Renewable energy generates jobs and investment across Australia, can help reduce power bills, encourages new businesses in manufacturing and installation, supports the modernisation of our energy system, can improve health and wellbeing by reducing pollution and can introduce greater competition in the energy market.

Australia's transition to a future powered by clean, affordable and reliable renewable energy and storage is underway, driven by the Renewable Energy Target and state and territory policies. The nation is currently experiencing a renewables and battery storage boom, with the rollout of the technology smashing annual investment records and renewables now accounting for almost 17% of Australia's electricity supply (Clean Energy Council 2018). At the time of writing, there are dozens of large-scale renewable and battery storage projects under construction and in the pipeline.

Figure 11: The Lakeland integrated solar and battery storage farm is the Southern Hemisphere's first large-scale integrated solar and battery storage facility.

AUSTRALIA IS EXPERIENCING A RENEWABLE ENERGY BOOM

Australia is experiencing a boom in renewable energy with over 5,000 megawatts (MW) of renewable energy projects like wind and solar farms under construction or about to start in 2018 (Clean Energy Council 2018). That's enough renewable energy to power millions of households!

Renewable energy can power the economy through a mix of wind and solar energy.

RENEWABLE ENERGY IS CLEAN, RELIABLE AND AFFORDABLE

Renewable energy can power the economy through a mix of wind and solar energy, together with on-demand renewables (such as solar thermal, biomass or hydro power) and energy storage (such as pumped hydro or batteries). Improved energy efficiency and demand response, such as installing modern appliances and ensuring these appliances are not running when electricity demand is high, can also help make the grid more reliable.

New renewable energy is driving down electricity prices by increasing electricity supply. Australia's coal power stations are reaching the end of their lives and need replacing. Renewable energy from wind and solar farms is the cheapest form of new power generation and is best suited to replace these old clunkers (Climate Council 2017b). More than 1.6 million Australian households are reducing their electricity bills with rooftop solar (Saddler 2018).

Figure 12: Sundrop Farms have built a solar thermal plant to power their tomato growing business in Port Augusta, South Australia.

RENEWABLES CAN BENEFIT REGIONAL AND RURAL AUSTRALIA

Regional and rural Australia is reaping the rewards of the clean energy boom, with 30-40% of renewable energy investment (between $1-2 billion dollars annually) flowing to the regions (Climate Council 2016b). Large scale wind, solar and energy storage projects are being rolled out and installed in regional and rural areas, boosting local construction and maintenance jobs and opportunities.

In another boost to regional communities across Australia, approximately $20.6 million is paid annually in lease payments to farmers and landholders hosting wind turbines (Climate Council 2016b). Renewable energy also has the power to reduce electricity costs for rural and remote communities, who traditionally pay much higher prices than their urban counterparts. It can also offer independence from the grid with several towns now racing to be the first to operate on 100% renewable energy.

Renewable energy also has the power to reduce electricity costs for rural and remote communities.

5. Communicating on Energy Storage

Since the South Australian blackout in late 2016, there has been an increased interest in energy storage projects to address perceived concerns around the reliability and security of the electricity grid. Energy storage solutions include batteries, pumped hydro and solar thermal.

Energy storage can help Australia transition to 100% renewable energy by storing excess renewable energy when it is not needed and then discharging it when it is needed. They can also provide essential grid services.

Australia has more than enough renewable energy resources to power all our electricity needs. In fact, the nation has enough renewable energy resources (sun, wind, water and geothermal heat) to power the country 500 times over (AEMO 2013).

Soaring energy prices and heightened media and political focus on blackouts have led to a range of actors, including private businesses and state/territory governments investing in a number of energy storage projects, particularly batteries. The first of these batteries – the highly publicised Tesla battery in South Australia – came online in December 2017.

In fact, ReachTel polling commissioned by the Climate Council in September 2017 showed three quarters of Australians expect household batteries to become commonplace within the next decade and over half expect large-scale batteries to be commonplace within the same timeframe (Climate Council 2018c).

The Federal Government also proposed in March 2017 to fund a massive pumped hydro project known as Snowy Hydro 2.0 (Snowy Hydro Limited 2018).

Figure 13: A battery storage installation in Sydney's Stucco apartments.

The Facts on Storage

THE COST OF BATTERY STORAGE IS RAPIDLY FALLING

Combined with rooftop solar, battery storage is helping Australian households and businesses take control of their rising electricity bills. The price of household battery storage is becoming increasingly affordable, with costs plummeting by 80% over the last 8 years. Meanwhile, the number of household batteries installed in Australia tripled during 2017 (SunWiz 2017).

Large-scale batteries coupled with renewable energy such as solar and wind farms are also becoming cost competitive with (and in many cases cheaper than) gas power stations.

ENERGY STORAGE CAN HELP AUSTRALIA REACH 100% RENEWABLE ENERGY

Energy storage coupled with renewable energy can provide electricity on demand, 24/7. Energy storage can store energy generated from renewables such as wind and solar, and then discharge it again when it is required. This technology can enable Australia to transition to 100% renewable energy while ensuring the national energy grid is secure and reliable. It is important to note that energy storage only makes sense as a climate solution when it is paired with renewable energy, or used to support the transition away from reliance on polluting coal and gas. Energy storage without renewable energy can increase emissions.

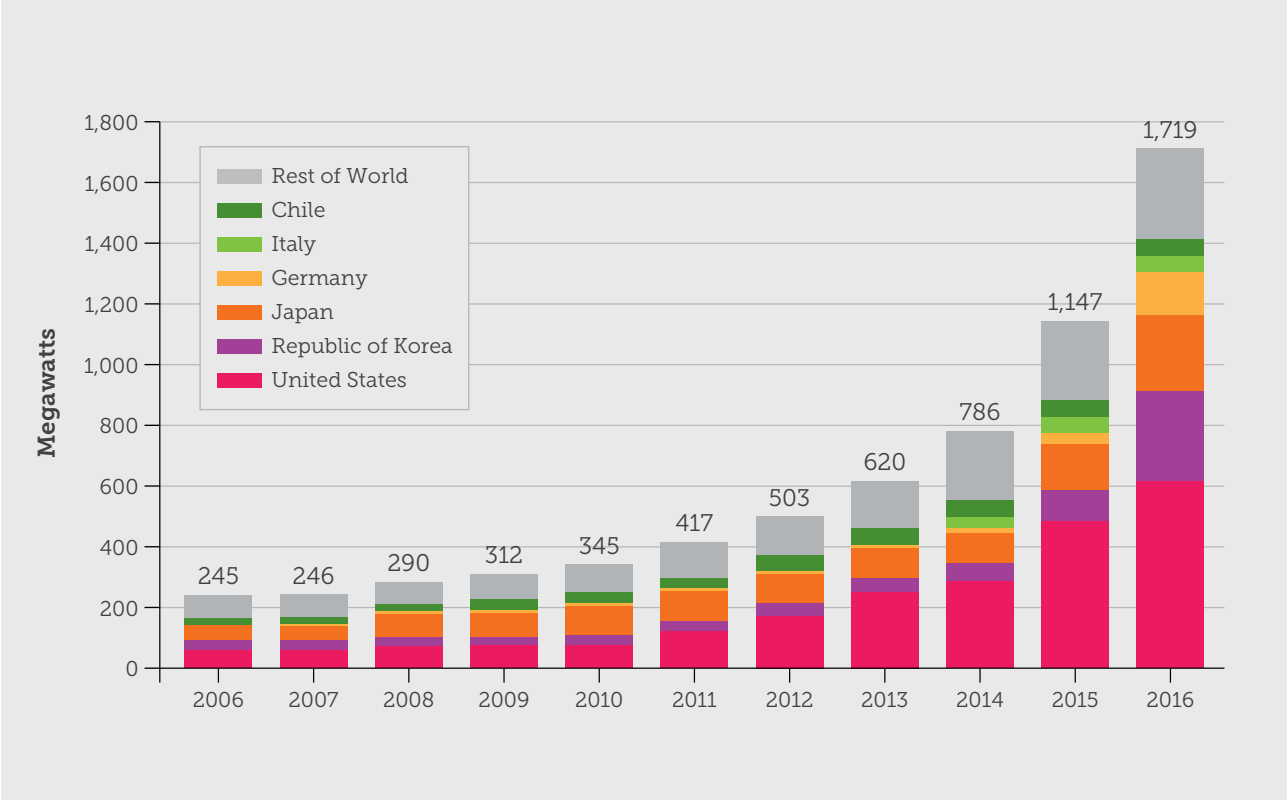
FASTER, MORE FLEXIBLE AND MORE RELIABLE THAN FOSSIL FUELS

Renewable energy and storage are now a more reliable source of electricity generation than Australia's ageing coal and gas fleet. This is because more than 50% of Australia's coal power stations will be over 40 years old by 2030, these power stations are slow to turn on and regularly break down, especially during extreme weather events such as severe heatwaves. There were over 40 coal and gas power station interruptions and breakdowns during the 2017-18 summer alone (The Australia Institute 2018).

In comparison, South Australia's Tesla battery has proven energy storage can step in to provide essential grid services far more quickly than coal or gas power stations. Batteries can be switched on and off in a matter of seconds, reaching 100% capacity almost instantly. In contrast, fossil fuel generators take a significantly longer amount of time to turn on and to reach their full capacity.

The price of household battery storage is becoming increasingly affordable, with costs plummeting by 80% over the last 8 years.

Figure 14: Global grid-connected battery storage capacity by country, 2005-2015.



Source: Adapted from: REN21 2017.

LARGE SCALE ENERGY STORAGE IS ALREADY ROLLING OUT ACROSS AUSTRALIA

Energy storage is here now. Many households, businesses, energy companies and state and territory governments are already investing in renewable energy and battery storage projects across Australia (Climate Council 2018b).

Several batteries and a solar thermal power plant are already under construction in South Australia, along with planning for a number of pumped hydro projects. Victoria has also begun rolling out batteries, while Queensland and the Northern Territory also have plans to build new batteries. Pumped hydro projects are being investigated in Tasmania and New South Wales, supported by the federal government.

Batteries can be switched on and off in a matter of seconds, reaching 100% capacity almost instantly.

Combating Negative Storage Narratives

"EVERY SOLAR AND WIND PROJECT SHOULD HAVE ENERGY STORAGE"

Energy storage is not needed for every wind or solar plant. It is more efficient for renewable energy to be backed up by a range of diverse power sources (onshore and offshore wind, utility scale solar PV, hydro-electricity, rooftop solar and solar thermal) and energy storage technologies throughout the energy system. So rather than have energy storage at every wind farm in South Australia, it may make more sense for batteries to be located at key points throughout the grid.

Australia may eventually need 450GWh of energy storage to support 100% renewable energy (Blakers, et al 2017). However, far less energy storage is needed at lower levels of renewable energy. Australia could reach 50% renewables without a significant requirement for energy storage (ACOLA 2017).

"WE NEED BIG PUMPED HYDRO PLANTS, LIKE SNOWY 2.0, TO PREPARE FOR A RENEWABLES FUTURE"

Australia needs a wide range of distributed storage technologies to ensure our future electricity grid is fit for purpose.

The electricity grid would be made more resilient with a number of small storage facilities – such as small-scale pumped hydro and batteries – than with a handful of very large energy storage facilities, like Snowy 2.0. Distributed storage improves the flexibility and resilience of the power system by ensuring that there is a variety of energy storage facilities that can be drawn upon in the event of a disturbance.

This will become increasingly important in the future as climate change worsens extreme weather events, particularly drought periods, making the electricity grid more vulnerable to damaging heatwaves, bushfires and storms.

Snowy 2.0 would be very vulnerable to extreme weather events and reliant on long transmission lines to transport electricity. It may also increase pollution in the absence of a big increase in renewable energy.

The vast majority of battery components and metals can be recycled when batteries reach the end of their life.

"BATTERIES ARE NOT SUSTAINABLE BECAUSE THEY CREATE WASTE AT THE END OF THEIR LIVES"

The vast majority of battery components and metals can be recycled when batteries reach the end of their life. They can be reused in another application or even in new batteries.

Historically lithium ion battery recycling rates have been low. It is important that governments start planning now to prepare pathways for battery recycling, to ensure that battery components are reused and do not end up in landfill.

"BATTERY MINING AND PRODUCTION IS NOT SUSTAINABLE"

Battery production often requires the extraction of metals, such as lithium and nickel. Proper regulations should be in place to ensure that these metals are extracted in a way that minimises environmental impacts. A number of these metals can also be sourced from recycled batteries and re-used.

"BATTERIES ARE TOO SMALL AND EXPENSIVE"

Battery costs vary significantly depending on the size and power of the battery. A home battery system to add to your rooftop solar can cost anywhere from $3,000 to $25,000, depending on the size and power of the battery. These costs are falling rapidly.

Many studies by analysts (such as RepuTex, SunWiz and BNEF) have found that battery storage costs have fallen significantly and are likely to continue to do so. The cost of lithium ion batteries has fallen 80% in just 8 years (BNEF 2017). Batteries are fast becoming cost competitive with peaking gas power stations, which provide power during times of very high electricity demand.

6. Communicating on Coal & Gas

Fossil fuels such as coal and gas served Australia well in its infancy as it progressed and developed into the nation it is today. As Australia continues to evolve, so must our electricity generation. With clean, affordable and reliable renewable energy and storage ready and available now, it's a no brainer that the transition away from ageing, inefficient and unreliable fossil fuels, through the planned retirement of power stations must continue.

Figure 15: Inside New South Wales' ageing Liddell coal fired power station.

Fossil Fuels & Climate Change

For a 75% chance of limiting global temperature rise to less than 2°C, more than two-thirds of known global gas reserves cannot be burned. Based on an economic analysis of how much coal, oil and gas can be burned for the world to have a 50% probability of keeping global temperature rise to 2 degrees Celcius (°C) and meeting our commitments under the Paris Agreement, 95% of Australia's coal reserves and 51% of our gas reserves must be left in the ground (McGlade and Ekins 2015; Climate Council 2017e). These reserves are unburnable. This means that in order to be consistent with our pledge to join the global effort to limit global temperature rise to less than 2°C, exploration of new reserves of conventional gas should end and there should be no development of unconventional gas. In order to tackle climate change, Australia also cannot bring online any new coal (Climate Council 2015).

Methane is a powerful greenhouse gas that creates 20 times the warming effects of carbon dioxide. The methane emissions from unconventional gas means that gas can be as polluting as coal.

Although the industry likes to make much of the shorter atmospheric lifespan of methane emitted when gas is burnt, this potent greenhouse gas does not magically disappear after a decade – it converts to carbon dioxide and worsens the overall concentration of carbon in the atmosphere (Climate Council 2017c).

The Facts on Coal

COAL IS AGEING, INEFFICIENT AND UNRELIABLE

The Australian Energy Market Operator (AEMO) has identified ageing coal power stations as a risk to reliable electricity supply (AEMO 2017). By 2030, most of Australia's coal fired power stations will be over 40 years old. Once the coal fleet reaches this age, they become increasingly expensive to run, and increasingly unreliable particularly during heat waves.

Maintaining a reliable supply of electricity into the future requires forward planning to replace ageing, inefficient and inflexible coal and gas power stations with distributed renewable energy and storage. Old fossil fuel power stations are a key threat to a reliable electricity supply. These power stations struggle to operate in extreme weather conditions, including extended heatwaves. In fact, these power stations tripped over 40 times during the 2017-18 summer (The Australia Institute 2018).

By 2030, most of Australia's coal fired power stations will be over 40 years old.

Table 1: Coal and gas unavailable in heatwaves 8-12 February 2017.

Date	State	Coal and gas fired power stations unavailable (MW)
8 February	South Australia	453
10 February	New South Wales	3,050
12 February	Queensland	787

Source: Climate Council 2017b.

Table 2: Coal fired power generation in New South Wales at 5pm 10 February 2017.

Power station	Registered capacity (MW)	Output at 5pm (MW)	Deficit (MW)
Bayswater	2,640	2,638	2
Eraring	2,880	2,438	442
Liddell	2,000	868	1,132
Mount Piper	1,400	1,292	108
Vales Point	1,320	1,230	90
Total	**10,240**	**8,466**	**1,774**

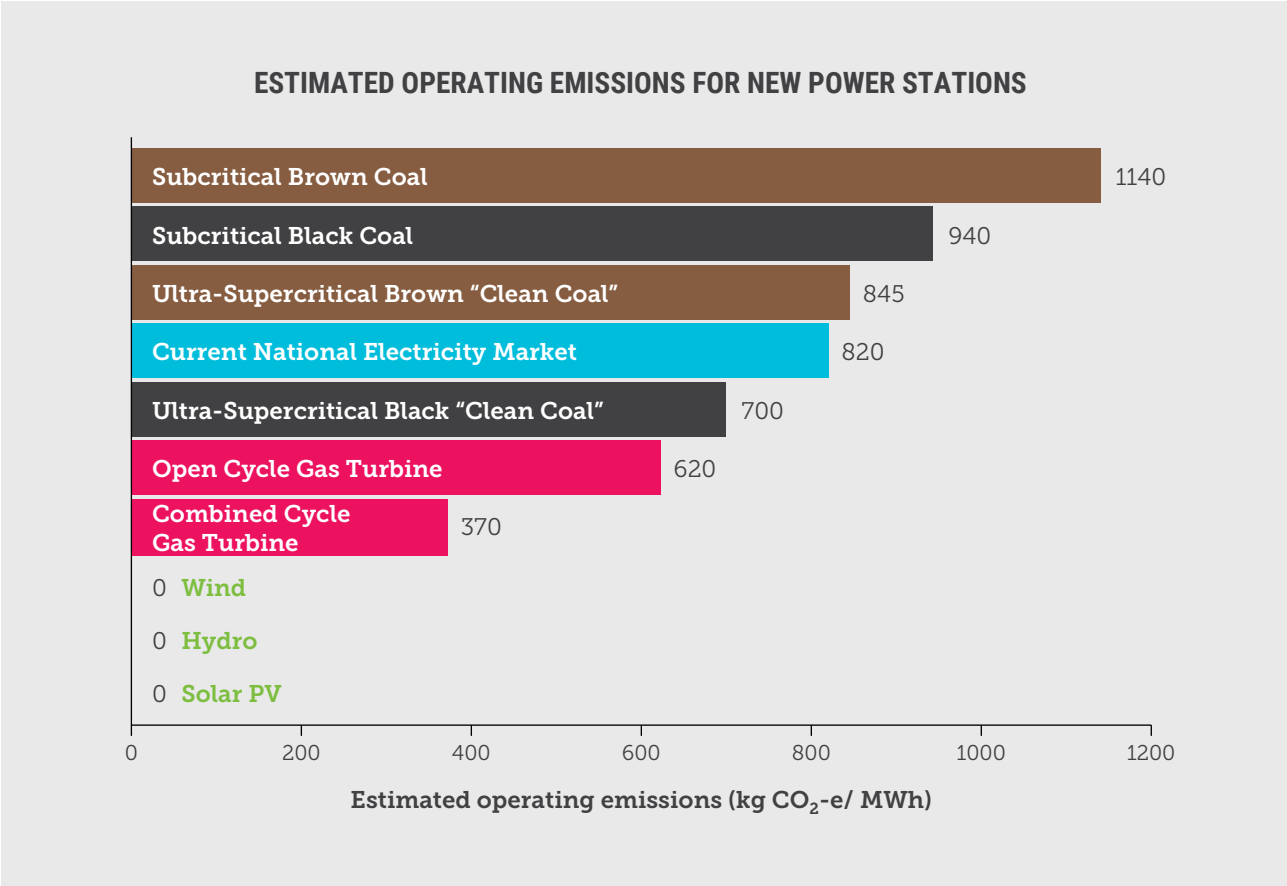
Source: Climate Council 2017b.

THERE IS NO SUCH THING AS "CLEAN" COAL

Coal is always polluting. When dug up and burned, coal pollutes the environment and damages our health. Burning coal for electricity emits toxic and carcinogenic substances into our air, water and land, severely impacting on the health of miners, workers and communities.

The Australian Academy of Technological Sciences and Engineering (2009) estimated coal's health impacts cost taxpayers $2.6 billion every year. Coal, and new coal mines such as the proposed Carmichael Mine, pose a serious risk to the environment, public health and the economy.

Figure 16: Estimated operating emissions for new power stations.



Source: Climate Council 2017c.

Coal's health impacts cost taxpayers $2.6 billion every year.

'ULTRA SUPERCRITICAL', 'HELE COAL' OR 'CARBON CAPTURE STORAGE' (CCS) ARE NOTHING MORE THAN BUZZWORDS

Coal power stations labelled "ultra supercritical" or "high efficiency low emissions", or HELE coal (what the Federal Government calls "clean coal") are very polluting, while coal power stations with carbon capture and storage (CCS) are prohibitively expensive and actually increase pollution.

CCS is a technique to capture, transport and store carbon emissions from fossil fuel power stations and energy intensive industries (eg. cement, steel and chemical production). There are only two operating coal CCS power stations in the world and they have both had significant cost over-runs or technical problems that have meant made storing carbon dioxide difficult. The two operating CCS coal power stations have actually resulted in increased greenhouse gas pollution due to the process being used to extract more oil. Over a billion dollars has been spent on CCS in Australia over the past 15 years, yet there has been no commercial development of a CCS power station (The Australia Institute 2017).

A new HELE coal power station run on black coal would produce about 75% of the greenhouse gas pollution of an existing coal power station of the same size. This is in comparison to clean renewable energy (eg. wind and solar) that emits zero emissions and is a far cheaper source of new power (Climate Council 2017d).

Figure 17: An open cut coal mine in New South Wales' Hunter Valley.

NEW COAL IS EXPENSIVE. RENEWABLES ARE THE CHEAPEST FORM OF NEW ENERGY GENERATION

Building new coal power stations are a very expensive option for replacing Australia's ageing, polluting and inefficient coal fleet. New wind and solar plants both in Australia and overseas are cheaper than new coal, gas and nuclear power stations.

For example, the Stockyard Hill Wind Farm will deliver power to the grid at a price of $55 per MWh (RenewEconomy 2017a) compared to a new coal power station that may cost up to $203 per MWh.

DEVELOPING ANY NEW FOSSIL FUEL PROJECTS MEANS AUSTRALIA WILL FAIL TO EFFECTIVELY TACKLE CLIMATE CHANGE

The burning of fossil fuels such as coal, oil and gas creates greenhouse gas pollution that intensifies climate change. Impacts include worsening many extreme weather events such as catastrophic bushfires, severe storms and deadly heatwaves.

Climate change endangers human health, our homes, our businesses, communities and our economies. Increasing awareness of the growing climate impacts and risks has spurred on global momentum away from coal. Many countries are shutting down or making plans to phase out existing coal-fired power stations while embracing renewable energy.

New wind and solar plants both in Australia and overseas are cheaper than new coal, gas and nuclear power stations.

The Facts on Gas

GAS POWER STATIONS ARE POLLUTING

While gas in specific instances can be less polluting than coal, gas is still a fossil fuel producing significant greenhouse gas pollution when burnt. From a climate perspective, new gas infrastructure would lock in continuing fossil fuel pollution for many decades (Climate Council 2017c).

Gas can only reduce greenhouse gas pollution levels under specific and limited circumstances. For example, gas can only reduce emissions when directly replacing the burning of coal as a source of electricity, and only in the event that the savings outweigh the fugitive emissions. (Fugitive emissions are the gases that leak or are vented during the extraction, production, processing, storage, transmission and distribution of fossil fuels such as coal, crude oil and natural gas). On average, gas power stations emit around half the carbon dioxide of coal power stations. However, some gas stations (e.g. Torrens Island, SA) are almost as polluting as black coal power stations.

Gas power stations rely on ageing infrastructure (storage wells, processing plants and pipelines), posing a risk of failure and potentially releasing significant amounts of methane (e.g. Montara oil platform fire). Emissions of methane (a potent greenhouse gas) from unconventional gas production may also cancel out any climate benefit of using gas over coal.

Figure 18: Inside South Australia's Torrens Island gas power station.

GAS IS A VERY EXPENSIVE FORM OF ENERGY GENERATION

Gas power is expensive, especially in Australia. This is the result of gas companies signing contracts to send the majority of Australia's gas supply offshore as liquefied natural gas (LNG), as well as a lack of competition amongst gas power companies.

With Australia's gas exports locked in under contracts, the LNG industry is pushing up domestic gas prices, in part because domestic gas prices are now directly linked to global oil prices. Australia's increased reliance on more expensive unconventional gas to fulfill these export contracts and meet domestic demand is also pushing up prices.

From a climate perspective, new gas infrastructure would lock in continuing fossil fuel pollution for many decades.

THERE'S NO ROOM FOR GAS IN AUSTRALIA'S ENERGY MIX

In order to tackle climate change, Australia cannot afford to build new infrastructure that locks in gas use for decades into the future, or allow more gas exploration.

This mean there is absolutely no room for gas expansion and, in fact, the industry will have to rapidly phase out before current reserves are fully exploited. Existing gas can help Australia transition quickly to renewables but we cannot afford to build in more gas-reliant infrastructure or to explore for more gas.

MOVING AWAY FROM GAS MAKES ECONOMIC SENSE

Burning gas is still a polluting source of electricity generation. Investing in natural gas in Australia will only delay the nation's inevitable transition to clean, affordable and reliable renewable energy.

Renewable energy is the cheapest form of new generation. Investing in gas production or power stations will lock in our reliance on an expensive and polluting fuel and delay the inevitable transition to renewable energy.

7. Communicating on Reliability

One of the most misleading arguments made by those opposing the transition to renewable energy are false arguments which relate to reliability. Renewable energy and storage technologies, like batteries, solar thermal and pumped hydro, can be used to build greater reliability and flexibility into Australia's electricity grid.

Figure 19: Renewable technologies, like rooftop solar combined with batteries, can provide households and businesses with a reliable and affordable supply of electricity.

Renewable Energy & Reliability

Renewable energy and storage technology is a winning combination, with the ability to provide a secure and dependable electricity system that is resilient in the face of extreme weather events due to intensifying climate change.

A range of renewable energy technologies such as wind, solar, biomass, hydro and energy storage are cost competitive with new fossil fuel power stations and can meet the technical requirements needed for a stable grid.

Technologies such as batteries, solar thermal and pumped hydro can meet demand for electricity at all times of the day as well as meeting technical requirements for grid stability. Combining these technologies with wind, solar and energy efficiency, electricity demand can be met around-the-clock, without locking in future greenhouse gas pollution or creating stranded fossil fuel assets.

Coal, Gas & Reliability

Unfortunately, Australia is home to one of the oldest, most inefficient and polluting coal fleets in the world. Many coal power stations are reaching or will soon be approaching retirement age and will need to be replaced. Ageing coal power stations are increasingly expensive to run and increasingly unreliable, particularly during heat waves.

The Australian Energy Market Operator (AEMO) has identified ageing coal power stations as a risk to a reliable electricity supply (AEMO 2017). Guaranteeing the reliability of the electricity grid into the future requires forward planning to replace ageing, inflexible coal and gas power stations with distributed renewable energy and storage.

Ageing and inefficient fossil fuel power stations are the key threat to reliability of electricity supply. These power stations struggle to operate in extreme weather conditions, including extended heatwaves. In fact, these power stations tripped over 40 times during the 2017-18 summer (The Australia Institute 2018). This includes several gas power stations that are barely ten years old.

Most of Australia's electricity generation is privately owned so decisions on the closure of coal power stations are made by private companies. Closure decisions may be considered or politically debated for a long time but then happen very quickly, such as the case of Hazelwood in Victoria's Latrobe Valley (ABC 2016). These quick withdrawals of generation can threaten the reliable supply of electricity if there is not enough notice and insufficient planning.

Many organisations, unions and environmental groups are in agreement about the need for a structured coal closure plan in Australia. Rapidly scaling up renewable energy and storage technologies needs to happen now to maintain a reliable power supply as coal power stations retire.

Figure 20: The Hazelwood coal power station , whose owners provided just six months notice before closing the power station in March 2017.

8. Communicating on Affordability

Communicating on the price of renewable energy for households can be challenging because it is both complex and contentious. Arguments on price are generally used to attack renewable energy, with opposition messaging vastly exaggerating the costs. It can be more effective to stick to many other benefits that are intuitive and less contentious.

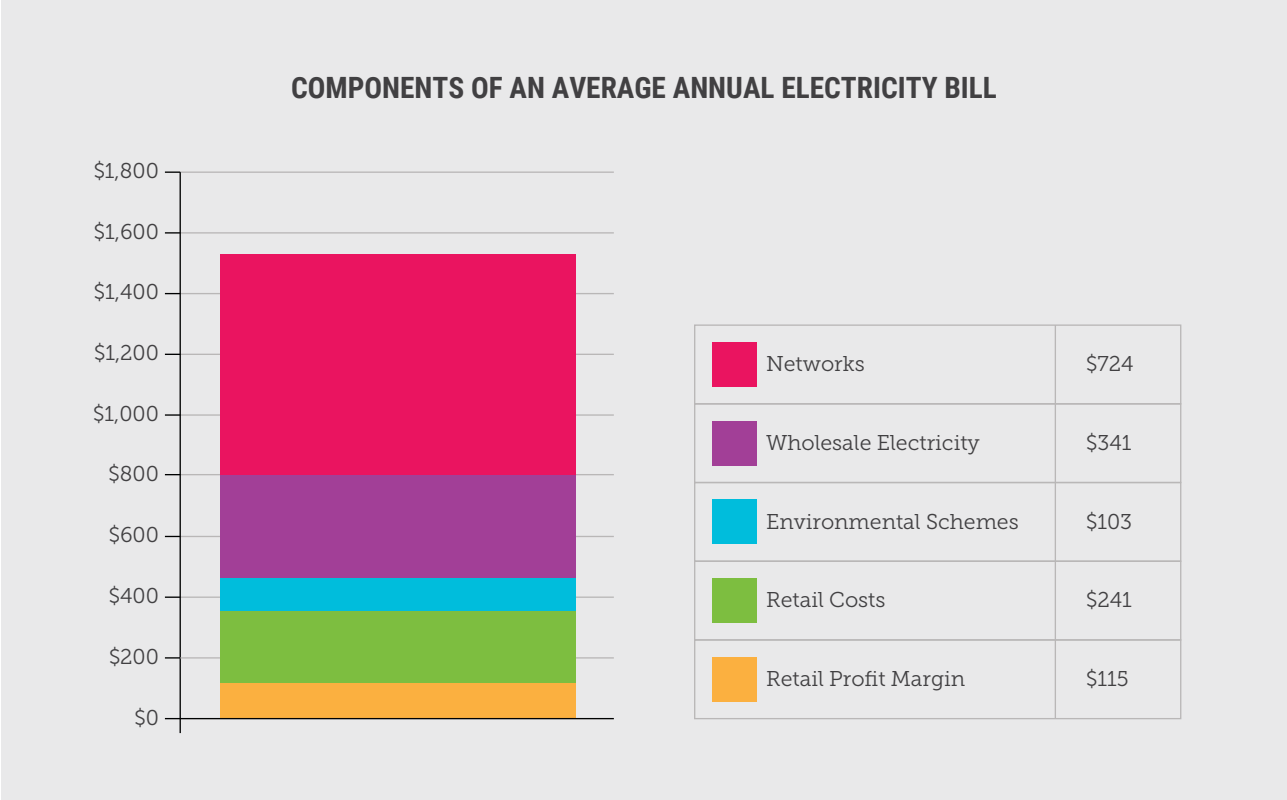
Figure 21: Australian households and businesses are installing rooftop solar in record numbers in order to reduce their power bills.

Australian households and businesses have put solar panels on their roofs to take control of their rising energy bills, and in a bid to have independence from the big energy companies and the national grid. Australia is now a world leader in household solar with more than 1.6 million Australian households installing the technology on their rooftops (Saddler 2018).

It is important to be aware that there are a number of important factors that go into communicating on consumer or household electricity bills. These include: network charges, retail charges and wholesale charges. Network charges cover the cost of the distribution and transmission network that transport electricity from power stations to the consumer. Retail charges are charged by the companies who sell electricity to consumers. Wholesale charges are the cost of generating electricity at power stations.

Australia is now a world leader in household solar with more than 1.6 million Australian households installing the technology on their rooftops.

Figure 22: Components of an average annual electricity bill.



Source: Adapted from: ACCC 2017.

Renewables, Storage & Affordability

NEW RENEWABLE ENERGY PROJECTS ARE NOW INCREASINGLY THE LOWEST COST OPTION FOR NEW ELECTRICITY GENERATION

Renewable energy such as wind and solar are the cheapest forms of new power generation (Climate Council 2018b; PV Magazine 2018).

The best prices for onshore wind and large scale solar are now well below the cost of new build coal-fired power generation (IEA 2015). As costs have fallen dramatically for renewable energy in the last five years, the median price of non-renewable power stations such as gas, coal and nuclear has increased (IEA 2015).

Table 3: The cost of building a new power station.

Power Technology	Levelised Cost of Energy (LCOE)$ (aus)/MWh
SA Solar Thermal Plant	$78[1]
Wind	$60 - 118[2]
Solar	$78 - 140[2]
Gas Combined cycle	$74 - 90[3]
Coal	$134 - 203
Coal with CCS	$352

Source: Climate Council 2017b.

[1.] Government of South Australia 2017

[2.] Note recent prices for wind are "well below" $60/MWh and large scale solar projects are reaching $60-70/MWh (PV Magazine 2018).

[3.] Based on gas prices of $8/GJ. Current gas prices are much higher than this, and at peak times can be up to 2-3 times higher.

WIND AND SOLAR PRICES HAVE FALLEN SIGNIFICANTLY IN THE LAST DECADE

Wind and solar prices have fallen significantly in the past decade and they are now the cheapest type of new-build generation – far cheaper than a new coal power station.

The cost of energy storage technologies is rapidly falling and becoming competitive with peaking gas power stations, particularly in light of the trebling of the domestic gas price over the last five years. In fact, the cost of lithium-ion batteries has fallen by 80% since 2010. Costs are expected to halve again by 2025 (Climate Council 2018b).

Combined with rooftop solar, battery storage is helping Australian households and businesses take control of their rising electricity bills. The number of household batteries installed in Australia tripled during 2017.

Globally, for every doubling in capacity, the cost of onshore wind has fallen by 21% every year since 2010, while the cost of solar PV has fallen by 35% every year (IRENA 2018). The levelised cost of energy of utility scale solar modules fell by 73% between 2010 and 2017 (IRENA 2018). Solar and wind power is now directly cost competitive with new fossil fuel power stations in many parts of the world.

AUSTRALIAN BUSINESSES ARE TURNING TO RENEWABLES AND STORAGE TO TAKE CONTROL OF THEIR POWER BILLS

Australian businesses are turning to solar installation in a bid to slash rising electricity costs, with a jump of 60% in installations over 2016 and 2017, with over 40,000 commercial systems now operating in Australia (ABC News 2017d). Research also shows that almost half (46%) of major companies are actively procuring renewable energy (ARENA 2017).

The number of household batteries installed in Australia tripled during 2017.

Coal, Gas & Affordability

Australia's electricity prices have been driven up primarily by overinvestment in the poles and wires of the electricity network. High gas prices, a lack of competition and policy uncertainty have also played a role in Australia's high electricity prices.

Wholesale energy prices have risen over the past few years due to rising gas prices and on going national policy uncertainty which has deterred investment in new renewable energy supply as coal power stations close (Climate Council 2018c). In Australia, renewable energy is the cheapest form of new power generation and can help reduce prices by increasing supply and providing low cost electricity.

High gas prices, a lack of competition and policy uncertainty have also played a role in Australia's high electricity prices.

Figure 23: The interior of the ageing Liddell coal fired power station.

EXTENDING THE LIFE OF AGEING, POLLUTING AND INEFFICIENT COAL POWER STATIONS IS HUGELY EXPENSIVE

The average age of Australia's coal power stations is 33 years old (Australian Energy Council 2017). By 2030, 55% of all coal fired power stations will be over 40 years old. Once power stations reach 40 to 50 years old, they become increasingly costly to maintain and are more prone to breakdowns and outages.

Extending the life of old, inefficient coal power stations, even for a short period, beyond their technical life is hugely expensive. For example, the cost of extending the life of the Liddell Power Station for ten years beyond its planned closure date (2022) is estimated to be at least $900 million (SMH 2017). The costs of refurbishment will likely be passed onto consumers through increased power bills. Keeping these power stations open beyond their technical life without refurbishing them will lead to an ongoing and increasing risk of a major outages.

Persisting with existing coal power stations beyond their technical design lives will lead to a less reliable power supply, higher electricity prices and continued high levels of pollution from Australia's electricity sector.

New solar and wind farms in Australia can provide electricity at a lower cost than new coal and gas plants. Renewables are the cheapest form of new generation and falling capital costs mean they are becoming cost competitive with existing power stations (comparing the cost of energy).

AUSTRALIA'S LIQUEFIED NATURAL GAS (LNG) EXPORTS ARE PUSHING UP DOMESTIC GAS PRICES

The LNG industry is pushing up domestic gas prices, in part because domestic gas prices are now linked to global oil markets. There is now an increased reliance on more expensive unconventional gas to fulfill export contracts and meet domestic demand which is also adding to increasing prices. This will continue into the foreseeable future.

The most economic and accessible reserves are now being exported. Further gas expansion will drive increased reliance on less accessible unconventional gas, which will be expensive.

Reliance on gas power stations for electricity generation is also driving power price spikes particularly in South Australia, due to a lack of competition among gas power companies (Climate Council 2017c).

INVESTMENT IN NEW GAS POWER STATIONS IS FINANCIALLY RISKY

Predicted large increases in future gas prices and volatility resulting from LNG exports together with domestic gas prices controlled by relatively few producers, make investments in new gas power stations very risky. New gas power stations would rely on ageing gas infrastructure (e.g. processing plants and high pressure pipelines) that is increasingly vulnerable to failure. The costs of updating this infrastructure and accounting for methane leakage must also be factored into policy and investment decisions. In addition, new gas infrastructure locks in carbon pollution for decades, when future regulations may impose higher costs or stricter limits on emissions in the future, impacting on the economic viability of gas production and electricity generation, leading to stranded investments (Climate Council 2017c). The falling cost of energy storage - which can provide many services more efficiently than gas power stations - may also outcompete gas, reducing their profitability.

AUSTRALIAN BUSINESSES AND HOUSEHOLDS HAVE BEEN HIT HARD BY RISING GAS AND ELECTRICITY PRICES

Australian businesses are experiencing high and rising gas and electricity prices, with gas prices tripling over the past five years and electricity prices for residential and small business users increasing by 80% to 90% in just one decade (Australian Industry Group 2017; ACCC 2017).

9. Global Energy Progress

AROUND THE WORLD, RENEWABLE ENERGY TARGETS (RETS) ARE THE MOST COMMONLY IMPLEMENTED CLIMATE CHANGE SOLUTION

In 2017, 179 countries had renewable energy targets. For example, India has committed to 40% renewable electricity by 2030 (which it will likely surpass), and New Zealand to 90% renewable electricity by 2025 and 100% by 2035 (The Conversation 2017a; 2017b).

Major economies like Germany and the United Kingdom are already actively transitioning to more flexible, modern grids powered by renewable energy. Sub-national governments or state governments around the world are also setting targets with leaders such as California on track to reach their 50% renewable energy target ten years ahead of schedule (CleanTechnica 2017a). More than 250 mayors in the United States have committed to have their cities powered by 100% renewable energy by 2035 (CleanTechnica 2017b).

GLOBAL COMPANIES ARE ALSO BECOMING MORE CLIMATE SOLUTIONS FOCUSED

Over 130 of the world's largest companies are committed to being powered by 100% renewable energy, while around two thirds of Fortune 100 and nearly half of Fortune 500 companies have also set ambitious renewable energy or sustainability targets (Climate Council 2018c).

RENEWABLES ARE ALREADY PROVIDING ALMOST ONE QUARTER OF THE WORLD'S ELECTRICITY SUPPLY

25% of global electricity came from renewables in 2017 (REN21 2018).

THE WORLD IS NOW BUILDING AND INVESTING MORE IN RENEWABLE ENERGY THAN FOSSIL FUELS

In 2016, renewables surpassed coal and gas to become the largest source of new global electricity capacity (IEA 2018). In 2015, around half a million solar panels were installed every day around the world (IEA 2016).

Over two-thirds of new capacity additions in 2016 were renewables and by 2022, renewables are expected to generate 30% of the world's electricity (IEA 2018). Investment in renewable energy like wind and solar now consistently beats coal.

Figure 24: In 2016, renewables such as wind, solar and hydro surpassed coal and gas to become the largest source of new global electricity capacity.

10. Communicating Australian Energy Policy

The NEG proposal could result in less renewable energy in 2030 than if the Federal Government were to do nothing.

Figure 25: The federal, state and territory energy ministers meet with the Energy Security Board.

What is the National Energy Guarantee (NEG)?

In October 2017, the Federal Government announced its proposed "National Energy Guarantee" (NEG) as Australia's climate and energy policy with the aim of addressing skyrocketing electricity prices and perceived weaknesses in supply in the National Electricity Market (NEM). The NEG comprises a reliability component called the "Reliability Guarantee" and an emissions component labelled the "Emissions Guarantee".

The proposed National Energy Guarantee features a 26% emissions reduction target by 2030 (on 2005 levels) as part of its response to climate change. The Federal Government's NEG announcement was based on an eight page letter from the newly appointed Energy Security Board (ESB), an energy panel tasked with creating the final sophisticated design of the policy.

According to the Energy Security Board's initial advice and subsequent documents, the NEG proposal could result in less renewable energy in 2030 than if the Federal Government were to do nothing. The NEG is expected to result in 28% to 36% renewable energy in 2030, limiting the overall share of wind and solar PV to 18% to 24% (Energy Security Board 2017).

Furthermore, the national emissions target under the NEG would be set in place through to 2030, and require five years notice for any future changes beyond 2030. This goal is completely inadequate in terms of the greenhouse gas pollution cuts required to tackle climate change, and limits the ability to ratchet up pollution cuts.

The proposed NEG may also restrict renewable energy policies by state and territory governments, with the Commonwealth Government stating these policies would be able to contribute to the NEG's emissions target.

The NEG also layers additional reliability requirements on electricity retailers, despite numerous Finkel Review recommendations on reliability already approved by the COAG Energy Council for implementation. The NEG is expected to lead to between 28% and 36% renewable energy by 2030. At the lower end of this range the NEG would result in a lower level of renewable energy than the Finkel Review projected under "business as usual conditions" (35% in 2030) (Finkel 2017).

For more information on the NEG, read the Climate Council's report:

'Clean & Reliable Power: Roadmap to a Renewable Future' (2018d).

The Facts on the National Energy Guarantee

THE NEG EMISSIONS TARGET IS WOEFULLY INADEQUATE

In order for Australia to do its part to tackle climate change, the electricity sector should reduce greenhouse gas pollution by at least 60% by 2030 (on 2005 levels). Under the NEG, the Federal Government proposes an emissions reduction target for the electricity sector of just 26% by 2030 (on 2005 levels). No further emissions reduction targets are then set beyond 2030.

The NEG also limits the ability to ratchet up greenhouse gas pollution cuts over the next ten years. As the biggest polluting sector with cost effective solutions readily available, the electricity sector should be responsible for a higher proportion of Australia's greenhouse gas pollution reductions.

THE NEG COULD SLAM THE BRAKES ON RENEWABLE ENERGY INVESTMENT IN AUSTRALIA

Under its proposed emissions reduction target of 26%, the NEG could actually result in less renewable energy than if the Federal Government were to do nothing, under "business as usual".

THE NEG COULD LIMIT STATE AND TERRITORY ACTION ON CLIMATE CHANGE

The proposed NEG may effectively set an 'upper limit' or block ambitious state and territory government policies that rollout clean, affordable and reliable renewable energy and storage technology.

As currently proposed, the NEG would effectively set an upper limit on state and territory government action on renewable energy, with the Commonwealth Government stating these policies would be able to contribute to the NEG's emissions target.

The majority of states and territories in the NEM (the electricity grid covering all states and territories except the Northern Territory and Western Australia) have adopted policies broadly in line with a goal of reaching 50% renewable energy by 2030.

All states and territories in the NEM have committed to net zero emissions in the electricity sector (and economy wide) by 2050. The current design of the proposed NEG will hamper states and territories in being able to achieve their targets.

The proposed NEG is inconsistent with these commitments as no further emissions reduction targets are set beyond 2030. Furthermore, the NEG's emissions reduction target is so mediocre that it may not achieve anything beyond existing state and territory policies.

RENEWABLE ENERGY IS REDUCING RISING ELECTRICITY PRICES - NOT THE NEG

The ESB, tasked with creating the high level design of the NEG has also produced modelling that concludes renewables are driving down electricity prices. Its modelling found that the major driver of falls in electricity prices over the next few years is thanks to new wind and solar being built under the existing Renewable Energy Target.

Without driving more investment in renewables, it is unclear how the NEG will reduce power bills as ageing coal power stations continue to retire.

THE NEG HAS MISDIAGNOSED A RELIABILITY PROBLEM FOR THE NATIONAL ENERGY GRID - AUSTRALIA'S POWER SUPPLY IS HIGHLY RELIABLE

Australia's electricity supply is highly reliable. When problems do occur, the vast majority of power interruptions are the result of transmission and distribution issues (AEMC 2018).

The Australian Energy Market Operator already has measures in place to ensure there is sufficient electricity supply to meet demand, and more reliability measures are on the way as adopted from the Finkel Review.

AGEING AND INEFFICIENT COAL AND GAS POWER STATIONS ARE UNRELIABLE

On the rare occasions where there is an insufficient supply of electricity generation, this is often the result of unplanned outages at coal and gas power stations. In summer 2017/18, these ageing and polluting fossil fuel generators faulted more than 40 times (The Australia Institute 2018).

Continued reliance on these old and inefficient power stations under the NEG will increase the vulnerability of all consumers who use electricity, especially during extreme weather events such as heatwaves.

THE NEG MAY ENTRENCH THE POWER OF THE BIG ENERGY COMPANIES

The NEM is already dominated by a few large energy companies, particularly in states like South Australia. The proposed design of the NEG risks further entrenching the market power of large energy companies owning both retail and generation assets like AGL, Origin and EnergyAustralia.

Combating Negative NEG Narratives

"THE NEG MAY NOT BE PERFECT BUT IT IS BETTER THAN NOTHING"

The NEG in its current form could actually result in less renewable energy than if the Federal Government were to do nothing at all ("business as usual"). The proposed NEG may effectively set an upper limit on state and territory government action on renewable energy, with the Federal Government stating these policies would contribute to the NEG emissions target.

As Australia's biggest polluter with cost-effective solutions readily available, the electricity sector can shoulder a higher proportion of Australia's greenhouse gas pollution reductions.

The lack of ambition in the NEG places Australia's renewables and storage boom at risk of grinding to a halt, while failing to adequately cut rising pollution levels and tackle climate change.

"AUSTRALIA'S ELECTRICITY SUPPLY IS NOT RELIABLE"

Australia's electricity supply is highly reliable.

The Australian Energy Market Operator already has measures in place to ensure there is sufficient electricity supply to meet demand, and more reliability measures are on the way as adopted from the Finkel Review.

Future reliability of supply requires forward planning to replace ageing, inflexible coal and gas power stations with distributed renewable energy and storage.

Combining low cost wind and solar PV with other renewable energy technologies such as solar thermal, hydro and biomass plants can provide round-the-clock, or on-demand power as well as meeting technical requirements for grid stability.

The lack of ambition in the NEG places Australia's renewables and storage boom at risk of grinding to a halt.

"WE NEED TO LIMIT RENEWABLES TO IMPROVE RELIABILITY"

On the rare occasions where there are issues with the reliability of electricity supply, this is often the result of unplanned outages at coal and gas power stations.

The NEG's proposed solution is to continue depending on centralised coal and gas power stations, when the recent track record of these fossil fuel power stations is anything but reliable.

In summer 2017/18, these ageing fossil fuel generators faulted over 40 times. Moving away from coal and gas and towards renewable energy and storage will improve reliability.

"WE NEED A BIPARTISAN ENERGY POLICY TO PROVIDE CERTAINTY AND REDUCE ELECTRICITY PRICES"

The strongest test of good climate and energy policy is whether it cuts Australia's rising pollution levels and tackles intensifying climate change, through supporting the rollout of renewable energy and storage technologies, along with the retirement of ageing, polluting and inefficient coal fired power stations.

A policy that fails to adequately respond to climate change (i.e. with insufficient greenhouse gas pollution cuts over the short and longer term) will not provide certainty because investors are already taking climate change into account when making investment decisions.

The transition to renewable energy and storage is inevitable and is happening now. The only thing putting this at risk is the Federal Government's lack of credible climate and energy policy.

11. Roadmap to a Renewables Powered Future

Australia needs a fresh approach to cutting greenhouse gas pollution from the electricity sector. The Climate Council has created a climate and energy policy roadmap outlining how Australia can cut its rising greenhouse gas pollution levels, while continuing to transition to clean, affordable and reliable renewable energy and storage technology.

The *'Clean & Reliable Power: Roadmap to a Renewable Future'* features 12 key policy principles for any national energy and climate policy framework, including the rollout of a minimum range of 50-70% renewable energy across Australia by 2030.

The *'Roadmap To A Renewable Future'* framework recommends Australia continues to transition away from its ageing, polluting and inefficient coal and gas fleet and encourage investment in a new clean power supply. The report calls for pollution targets which can be ratcheted up along with transparent tracking and reporting of greenhouse gas pollution levels.

In summary, the key requirements for building a robust energy system to meet Australia's needs into the future are:

1. Clean: Tackling climate change requires a rapid transition away from polluting sources of energy to clean sources.

2. Reliable: Balancing demand for electricity (from households, business and industry) with supply from power stations, energy storage and demand flexibility (via demand management).

3. Secure: Meeting technical requirements for grid stability (described by terms such as "frequency control" and "inertia"), ensuring the power grid can overcome disturbances.

4. Resilient: Delivering reliable power in the face of increasingly severe weather events influenced by climate change.

5. Affordable: Lowering electricity costs for households and businesses.

All of these elements must be met for Australia to effectively meet its energy needs into the future.

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