

"It's time to  
take charge of our  
energy future"

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South Australian power for South Australians.



Government  
of South Australia

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# MESSAGE FROM JAY

The national energy market is failing South Australia and the nation.

Our country, with its abundance of solar, wind and gas resources, is now facing an energy crisis.

We also have a system that puts profits before people.

While coal-fired power stations across Australia are shutting down, an absence of coherent national energy policy and ideological attacks on the renewable-energy sector have led to under-investment in much-needed new energy sources.

The privatisation of our State's energy assets has placed an enormous amount of power in the hands of a few energy companies.

These factors, together, have led to too little competition in our national energy market. It is a market that benefits the owners of the privatised assets, rather than the people and businesses who depend on this essential service.

Today in South Australia, that all changes.

Today the State Government unveils a 21st Century energy plan that protects the people.

It is an energy plan that delivers more generating capacity, greater competition, increased public ownership of assets, more renewable energy with battery storage, more gas supplies and more job opportunities for South Australians.

It is a plan that gives the State Government the legislated power to direct companies to turn on their generators during extreme weather events.

South Australia is taking charge of its energy future. Our plan puts South Australians first.

Our plan will make our power supply more reliable, put downward pressure on prices and create jobs.

In the longer term, South Australia will become more self-reliant for its power supply.

As a state that has built its reputation on its clean green environment, this plan recognises that clean energy is our future. We will now lead Australia's transformation to the next generation of renewable storage technologies and create an international reputation for high-tech emerging industries.

South Australia will take charge to source, generate and control more of its power right here in South Australia.

Our work on delivering this plan starts today.



**Jay Weatherill**  
Premier of South Australia



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## **OUR VISION**

**TO SOURCE, GENERATE AND CONTROL  
MORE OF SOUTH AUSTRALIA'S POWER  
SUPPLY IN SOUTH AUSTRALIA SO WE  
CAN INCREASE SELF-RELIANCE AND  
PROVIDE RELIABLE, COMPETITIVE AND  
CLEAN POWER FOR ALL INTO THE FUTURE.**

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# WHAT ARE WE DOING?

South Australia's energy plan will give our state greater local control of our energy security.

We are incentivising local exploration for more gas supplies to feed new generation and the state will be at the forefront of next-generation renewable storage technology.

Implementation of this plan is already underway. Initial estimates put the cost of delivering this plan at \$550 million. Final costings will be outlined in the 2017-18 State Budget.

## SOUTH AUSTRALIA'S ENERGY PLAN WILL DELIVER:



### BATTERY STORAGE AND RENEWABLE TECHNOLOGY FUND

Australia's largest battery will be built in South Australia to store renewable energy and add stability to supply as part of a new \$150 million Renewable Technology Fund.



### NEW GENERATION MORE COMPETITION

The State Government will use its bulk-buying power to attract new electricity generation to increase competition and put downward pressure on prices.



### STATE-OWNED GAS POWER PLANT

The South Australian Government will build its own gas power plant to have government-owned stand-by power available in South Australia for emergencies.



### SOUTH AUSTRALIAN GAS INCENTIVES

The State Government will offer incentives to source more gas for use in South Australia, replacing coal-fired energy from Victoria.



### LOCAL POWERS OVER NATIONAL MARKET

The State Government will legislate to give the Energy Minister direction over the market so South Australia's best interests always come first if there is an electricity shortfall.



### ENERGY SECURITY TARGET

A new target will increase South Australia's energy self-reliance by requiring more locally generated, cleaner, secure energy to be used in South Australia.

# HOW WILL THIS PLAN WORK?



## BATTERY STORAGE AND RENEWABLE TECHNOLOGY FUND

**Goal:** Provide South Australia with large-scale storage for renewable energy so power is available when it is needed, beginning the transformation to next-generation renewable technology.

The State Government will establish a \$150 million fund to support projects that make renewable energy available 24 hours a day, seven days a week, to power the state when it is needed.

The first project to be funded will be a grid-connected battery – the largest in Australia – to provide the state with 100 megawatts of storage.

The battery will modernise South Australia's energy grid and begin the transformation to the next generation of renewable-energy storage technologies.

The Renewable Technology Fund will provide \$75 million in grants and \$75 million in loans, to eligible projects, to support private innovative companies and entrepreneurs.

There are a number of large-scale projects under consideration in South Australia, including solar thermal, biomass, hydrogen energy and pumped hydro.



## NEW GAS POWER PLANT

**Goal:** Provide South Australia with a government-owned source of emergency electricity generation.

The State Government will build its own gas-fired electricity generator.

Due to the lack of clear national policy settings, investment in new thermal generation has stalled.

The generator will provide up to 250 megawatts of generation, which can be switched on in times of emergency.

At all times, the generator will make South Australia's electricity supplies more secure by offering the inertia that is needed to stabilise local supplies.

This generator is a strategic future asset to unlock economic growth once the appropriate national energy policy settings are implemented.

The government will go to tender shortly to have the generator in place as soon as possible.

### *Temporary energy security measure*

In the intervening period, the State Government will work with South Australia's transmission and distribution companies to provide up to 200 megawatts of temporary generation.

This will provide generation for use over short periods in emergency situations where extreme peaks in demand create a shortfall that cannot be met in other ways.



## LOCAL POWERS OVER NATIONAL MARKET

**Goal:** Give South Australia greater local powers over national market operators and privately owned generators.

The State Government will legislate to ensure that South Australian energy users are not held hostage to unwarranted market behaviour.

The Minister for Energy will be given strong new powers to direct the national market in the case of an electricity supply shortfall.

Ministerial direction includes the ability to direct generators to operate and direct the Australian Energy Market Operator to control flow on the interconnector.

This will ensure every available option is activated to maintain the state's electricity supply in an emergency situation or when market forces fail.

Drafting of new legislation will begin immediately. The Minister's power will be used as a last-resort measure if the national market does not act in South Australia's best interests.

### *Local assessment of generation applications*

South Australia will require applicants for new electricity-generation projects to demonstrate how they add to local energy-system security.

The State Government will give powers to the Office of the Technical Regulator to assess applications for all generators above 5 megawatts.

The goal is to add stability to local power supplies by requiring developers to include power system security services as part of their projects in South Australia.

This move is part of the state's development of the next generation of renewable energy.

This will complement the Essential Services Commission of South Australia's decision to strengthen licence conditions for all new generators.



## ENERGY SECURITY TARGET

**Goal:** Create new investment in cleaner energy to increase competition, put downward pressure on prices and provide more energy-system stability.

A new target will require energy retailers to get more electricity from cleaner generators that produce their electricity using South Australia's abundant natural resources.

In a move to increase South Australia's energy self-sufficiency, retailers will be compelled to source a percentage of energy from local generators rather than from Victorian coal through the interconnector.

The energy security target is modelled by Frontier Economics. Similar schemes have worked around the country to lower energy prices and stimulate exploration investment.

South Australia is rich in energy-producing resources, including gas, solar, wind, biomass and graphite, which is used for batteries.

Analysis by Frontier Economics shows that new investment generated by the energy security target will create more competition and put downward pressure on prices.

South Australia has advocated for a national Emissions Intensity Scheme (EIS) to incentivise investment in cleaner generation. This scheme is not supported by the Federal Government, despite widespread industry and scientific support.

South Australia's energy security target will transition to an EIS or Lower Emissions Target (LET) if or when national policy changes in the future.



## SOUTH AUSTRALIAN GAS INCENTIVES

**Goal:** South Australia to source and use more South Australian gas to generate its own electricity, increasing the state's self-reliance.

A range of measures is being introduced to incentivise exploration for gas.

### *Sourcing more local gas*

To meet the increasing level of gas-fired generation, the State Government is investing to unlock more of South Australia's abundant gas resources.

South Australia has vast untapped gas resources. It is estimated the Cooper Basin alone could potentially supply Australia's energy needs for more than 200 years.

The Plan for Accelerating Exploration (PACE) grant-supported projects are estimated to generate \$198 million in prospective expenditure.

The State Government will immediately provide an extra \$24 million for a second round of funding to incentivise companies to extract even more gas and create more jobs. This new round will open immediately.

This will increase the supply of South Australian gas into the local energy market. South Australian energy generators, industry and households will have first offering.

### *Royalties for landowners*

A new PACE Royalties Return Scheme will provide 10 per cent of royalties to landowners whose property overlies a petroleum field which is brought into production, opening up new exploration across South Australia.

## CREATING JOBS AND SA SUCCESS STORIES

### AGL Hallett wind farms

The construction of wind farms at Brown Hill, Hallett Hill, North Brown Hill and Bluff Range created an average of 266 jobs during construction, with 36 permanent employees during operations.

# HOW WILL THIS PLAN WORK?



## NEW GENERATION FOR MORE COMPETITION

**Goal:** Create more electricity generation to increase competition and put downward pressure on prices.

Every year, the State Government pays millions of dollars to power hospitals, schools and government services.

The government is using its buying power to make the local energy market more competitive and stimulate investment in the right types of generation.

### *New generation*

New electricity generators will enter the South Australian market as a result of the State Government tendering 75 per cent of its electricity needs over the next 10 years.

It is anticipated this procurement will result in construction of a new privately owned generator in South Australia.

Increasing competition in the energy market is the best way to drive down power prices for South Australian households and businesses.

### *More dispatchable renewable energy*

Energy that can be dispatched as it is needed helps to provide energy security. Large-scale storage transforms renewable energy into dispatchable energy.

As part of South Australia's renewable energy transformation, the government is tendering the remaining 25 per cent of its electricity load to support dispatchable renewable energy initiatives.

The new contracts will commence on 1 January 2018.

## HOW WILL THIS PLAN CREATE JOBS?

The State Government is investing in energy initiatives that will create new jobs for South Australians.

Initial estimates predict

# 530

full-time equivalent jobs will be created through the construction of initiatives outlined in this plan.

# 100

full-time equivalent jobs will be created through increased gas exploration.

South Australia has had 17 months of continuous jobs growth and it created more jobs than any other state except Victoria in 2016. This is the result of long-term investment in infrastructure projects and job-creation measures.



# WHY ARE WE DOING THIS?

## South Australians rightly regard electricity as an essential service.

Local businesses and industries rely on power for their viability and householders for their daily lives, health and comfort.

As a state we should be aiming for the lowest cost of energy to support jobs and industry.

However, from Queensland to South Australia, significant change is occurring in the National Electricity Market.

In the past five years, nine coal-fired power stations have closed, including the Northern Power Station at Port Augusta. The 10th, Hazelwood in Victoria, closes from late March 2017.

Without clear national policy settings there has been little to no investment to replace the thermal generation that has exited the system.

The price of electricity has increased dramatically over a short period of time for a number of reasons, including an absence of policy leadership at a national level, gas shortages and a lack of competition.

These pressures are being acutely felt around the nation as energy prices increase to levels that are uncompetitive and unsustainable.

Industry and small businesses, in particular, are feeling the impact of these price hikes. These challenges have been further amplified by a recent AEMO report predicting a nationwide shortfall of gas supplies and, subsequently, electricity in the near future if no action is taken.

Renewable energy is growing, but investment is needed to build the next generation of technologies to store this energy to be able to dispatch it when it is needed.

On top of this, a year of extreme weather events in South Australia tested the system, as parts of the transmission and distribution networks were repeatedly and destructively damaged.

These factors are affecting the security and affordability of electricity supply across many states, including South Australia.

The national market is now widely considered to be failing and in need of urgent reform.

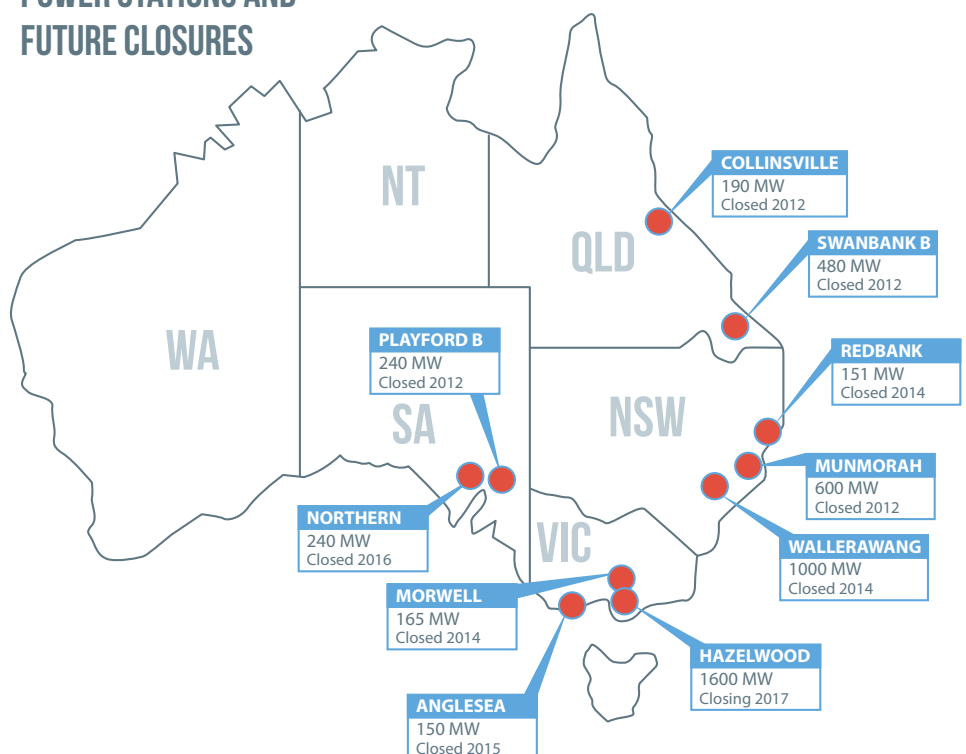
The ability of governments to influence the industry requires cooperation within and across state borders and at a Federal level – cooperation that needs to transcend politics and self-interest.

Recent events, however, have highlighted the need to fast-track South Australia's energy transformation to rebuild confidence in the reliability of supply.

South Australians have faced blackouts throughout our history and networks with above-ground transmission towers, poles and wires will always be vulnerable to weather and breakdowns. Consequently, no government can guarantee the power will never go out.

This plan responds to these challenges and ensures the energy requirements of the state can continue to be met into the future.

## CLOSURE OF COAL-FIRED POWER STATIONS AND FUTURE CLOSURES



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# WHAT DOES THIS PLAN MEAN FOR YOU?

**SOUTH AUSTRALIANS WILL HAVE  
MORE RELIABLE ELECTRICITY  
SUPPLIES INTO THE FUTURE.**

**MORE COMPETITION WILL  
PUT DOWNWARD PRESSURE ON  
ELECTRICITY PRICES IN  
SOUTH AUSTRALIA.**

**NEW JOBS WILL BE CREATED  
FOR SOUTH AUSTRALIANS.**

**OUR CHILDREN AND GRANDCHILDREN  
WILL INHERIT A CLEANER AND  
GREENER SOUTH AUSTRALIA.**

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# WHAT HAVE WE DONE SO FAR?

The State Government has been investing in programs that add to system security and support energy efficiency for householders and business owners.

## INVESTIGATION OF NEW REGULATED INTERCONNECTOR

The 2016-17 State Budget put \$500,000 towards a feasibility study to explore options for greater energy interconnection with the eastern states.

The study, being conducted by ElectraNet, is looking at how greater interconnection can ensure South Australia obtains more baseload power when required, and exports more wind and solar power.

This is in addition to the upgrade of the Heywood Interconnector, which sends electricity between South Australia and Victoria.

## ENERGY SECURITY ON THE EYRE PENINSULA

The State Government has asked the Essential Services Commission of South Australia (ESCOSA) to investigate how electricity companies can improve power reliability on the Eyre Peninsula.

The Eyre Peninsula experienced frequent and extended power outages during storms in 2016.

ESCOSA will investigate and make recommendations on measures to incentivise the private owners of transmission and distribution networks to upgrade current infrastructure and reconnect supply more quickly after storm events.

The Office of the Technical Regulator will provide advice on technical aspects of the investigation.

ESCOSA will also investigate and report on the costs associated with each potential reliability measure it recommends and who would be required to bear those costs.

## HELP FOR LARGE EMPLOYERS TO MANAGE POWER COSTS

The State Government is providing \$31 million over two years to help large South Australian businesses to manage their electricity costs.

Businesses that use more than 160 megawatt hours of electricity each year are eligible for funding to undertake energy audits to find ways to reduce their power bills. Audits will be completed by June 2017.

Grants are also available to support projects that promote efficiency, such as the installation of solar systems with battery storage units.

The funds will support:

- up to 500 South Australian businesses to undertake energy audits
- at least 110 businesses to implement audit recommendations
- at least six major energy-saving opportunities.

## MAKING OUR SCHOOLS MORE ENERGY EFFICIENT

Schools with high energy use will become more energy efficient, shaving an estimated \$2 million from power bills each year, through a \$15 million State Government investment.

The program will provide grants to support:

- 40 schools to install solar panels and LED lighting
- 200 schools to replace inefficient lighting, and install sensors and timers.

Thirty-eight full-time jobs will be created and installation will start in 2017.

## SOLAR POWER FOR HOUSING TRUST HOMES

Work has started to install 400 solar-panel installations in Housing Trust homes across 40 South Australian suburbs and regional towns.

The initiative will help residents save money on their power bills and will support more than 75 South Australians working for three local companies that are installing the panels.

## HOW THIS PLAN FITS WITH STATE GOVERNMENT PRIORITIES

Our state has 10 Economic Priorities to support South Australia as a place where people and business thrive.

Ensuring South Australia has a reliable and secure source of energy for the future is critical to each of these priorities.

# WHAT ARE THE CHALLENGES?

## PRIVATISATION OF THE ELECTRICITY NETWORK

All of South Australia's electricity network is currently in the hands of private operators. This means the State Government does not own or control the generation, transmission and distribution of electricity.

In 1946, the then State Government nationalised the Adelaide Electric Supply Company to become the Electricity Trust of South Australia (ETSA).

For the next half a century, the electricity supply system in South Australia was owned by and run for the people of the state.

ETSA played an important role in the development of the state, particularly by ensuring electricity supply for the development of manufacturing, mining and other heavy industries.

In 1999, the former State Government sold the generation, transmission, distribution and retail arms of ETSA to private sector companies under 100-year or 200-year leases.

Companies involved in South Australia's energy networks, many of which have international owners, now include:

- Transmission and interconnector assets – ElectraNet
- Distribution – SA Power Networks
- Large thermal generators – AGL (Torrens Island), Engie (Pelican Point), Origin Energy (Osborne and Quarantine) and EnergyAustralia (Hallett)

The recently closed Northern and Playford power stations were owned by Alinta Energy and are at an advanced stage of deconstruction.

## THE NEED TO MODERNISE THE NATIONAL MARKET

South Australia is connected to the National Electricity Market (NEM), along with Queensland, New South Wales (including the Australian Capital Territory), Victoria, South Australia and Tasmania.

The NEM incorporates about 40,000km of transmission lines and cables and it supplies about nine million customers, with a total generation capacity of 45,000 megawatts.

Within this national market, energy is sold and then dispatched to each region. The price of wholesale electricity is determined through this market, and \$7.7 billion was traded in 2014-15.

Australia's Chief Scientist, Dr Alan Finkel AO, is chairing an Independent Review into the Future Security of the National Electricity Market. The review's preliminary report has been released and states:

*"(The NEM) was designed for a world that was less complex than today, in which traditional generation (coal, gas and hydro) provided for all of our electricity needs. Since then, the parameters have changed.*

*"New technologies are emerging more rapidly than previously envisaged. Variable renewable electricity generation, particularly wind and solar photovoltaic, is increasing.*

*"Concurrently, demand for electricity from the NEM has declined, driven by increasing energy productivity, improving energy efficiency, increasingly distributed self-generation, and a decline in industrial consumption.*

*"Retail prices... have also increased substantially in the last decade.*

*"We now have a once-in-a-generation opportunity to reform the NEM, to make it more resilient to the challenges of change, and to enable the new and better services Australians want. Recent events in South Australia and the announced closure of Hazelwood Power Station in Victoria have underscored the urgency of this task."*

The preliminary report notes that the way the NEM works does not encourage the adoption of solutions that would support power-system security. The report states:

*"Emerging markets for ancillary services, required to maintain system security, have not kept pace with the transition. New and updated frameworks, technical standards and rules may be required."*

The "increasingly urgent" need for greater gas supplies for electricity generation, in light of a tightening in supply, is considered a critical component.

The final report is expected in the first half of 2017.

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## A NATIONAL EMISSIONS INTENSITY SCHEME

South Australia has advocated for an Emissions Intensity Scheme (EIS) as a way to incentivise more secure, cleaner power into the market and an orderly transition of existing coal-fired power stations out of the market.

There are growing calls nationally for an EIS, with the following groups and individuals voicing support:

- National Farmers' Federation
- CSIRO
- Chief Scientist Dr Alan Finkel AO
- BHP
- Australian Industry Group
- AGL
- Origin
- Australian Energy Market Commission
- Clean Energy Council
- Frontier Economics

An EIS works by establishing an emissions-intensity baseline for the generation sector. Power stations that generate above the baseline are required to purchase credits. Less emissions-intensive power stations receive credits which they can sell.

Coal-fired power stations would fall above the baseline, while gas and renewables would fall below, meaning as coal-fired power stations continue to exit the market they would help incentivise new investment in lower-emitting forms of energy.

An EIS has been backed in an assessment by the Australian Energy Market Commission and the Australian Energy Market Operator that looked at a range of potential emissions-reduction policies.

The Finkel review's preliminary report states the assessments found "an EIS best integrated with the electricity market's pricing and risk management framework, had the lowest economic costs and the lowest impact on electricity prices".

The South Australian Government will continue to advocate for a national EIS despite the Federal Government ruling out this measure.

## THE ROLE OF INTERCONNECTORS IN THE NATIONAL MARKET

Interconnectors are expected to play an increasing role in a national move to a renewable future by allowing more renewable energy to be moved between states.

South Australia is well positioned to play a leading role with its large amount of wind and solar generation, and investment through this plan in next-generation renewable technologies.

The State Government-supported study by ElectraNet will advise on the feasibility of a new regulated interconnector with the eastern states.

This measure remains on the table as the State Government implements South Australia's energy plan.

*"We now have a once-in-a-generation opportunity to reform the NEM, to make it more resilient to the challenges of change, and to enable the new and better services Australians want. Recent events in South Australia and the announced closure of Hazelwood Power Station in Victoria have underscored the urgency of this task."*

Dr Alan Finkel AO

# MOVING TO A RENEWABLE ENERGY FUTURE

**Around the world, trillions of dollars are being invested in renewable energy.**

This is because renewable energy is fast becoming the cheapest way to invest in new electricity generation, and it does not create pollution that causes global warming.

In Australia, the Federal Government, by agreeing to the international agreement on climate change, known as the Paris Agreement, has committed Australia to producing energy, in ways that do not cause pollution, by the middle of this century.

With its abundant natural resources, South Australia has been leading Australia's efforts to clean up the electricity sector.

The state's energy comes from a mix of renewable energy and gas, which produces much less pollution than electricity generated from coal.

Renewable energy is also good for jobs and the economy.

Investment in renewable energy has seen more than \$7.1 billion invested in the state, with more than 40 per cent being in regional areas. This

investment has been driven by the national Renewable Energy Target.

These investments have helped create new industries and jobs for South Australians.

As South Australia nears its target of generating 50 per cent of its electricity from renewable energy, the challenge will be to generate even more in a national market that is old and outdated.

This is where gas can play a role as a transitional fuel. Gas also has a role nationally, as coal-fired generators close.

In the past decade, nine coal-fired power stations have closed in Australia, including the Port Augusta plant in South Australia. Australia's most emissions-intensive power station, Hazelwood in Victoria, closes from late March 2017.

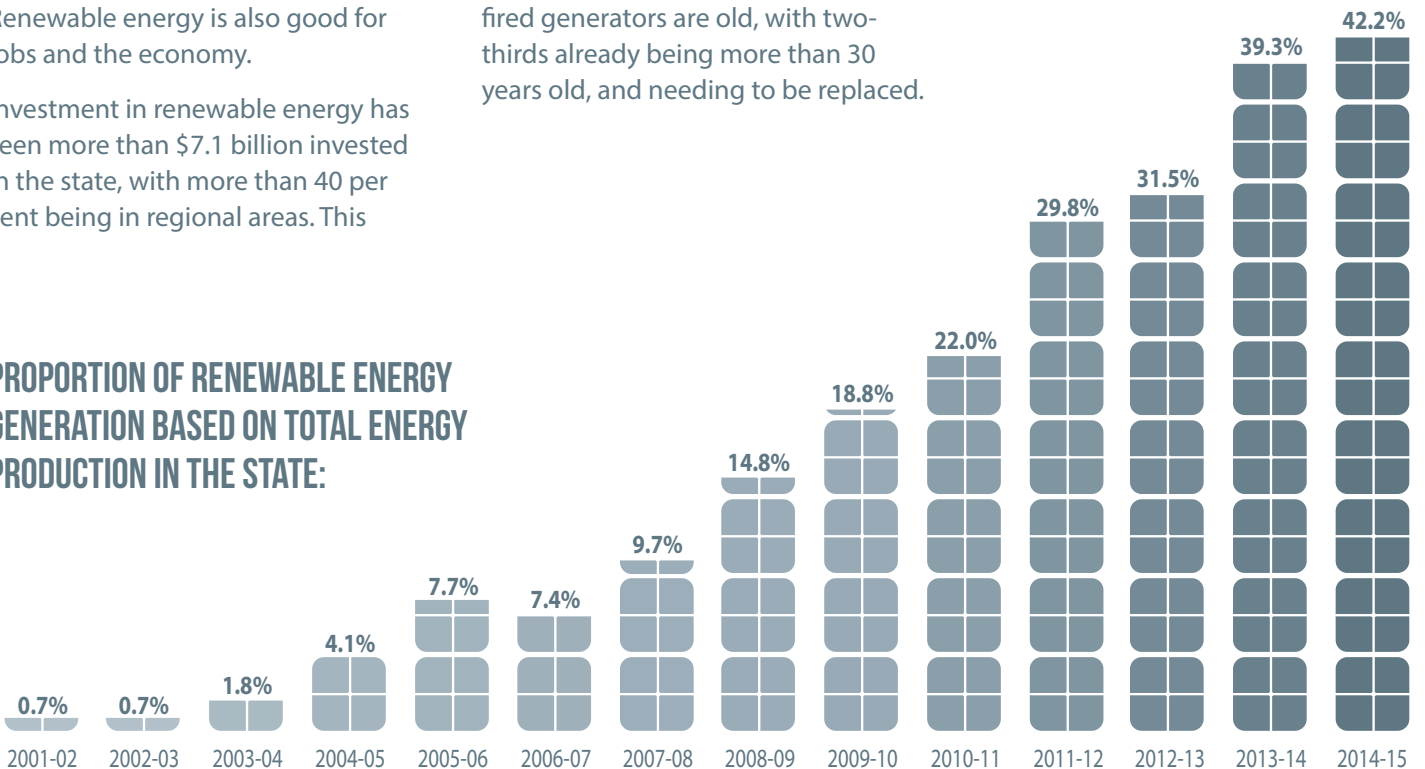
This is occurring because most coal-fired generators are old, with two-thirds already being more than 30 years old, and needing to be replaced.

As the preliminary report of a review into the National Electricity Market states: "Owner-investors are exiting emissions intensive power stations as these reach the end of their design lives. It has been clear from our consultations that no one is contemplating investing in new ones, nor would financial institutions provide finance."

Given this uncertainty, the only way for new transitional generation to be built in South Australia is for the government to invest in building its new gas-fired power plant.

South Australia will continue to lead the way in the transformation to the next generation of renewable technologies.

## PROPORTION OF RENEWABLE ENERGY GENERATION BASED ON TOTAL ENERGY PRODUCTION IN THE STATE:



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# SA FIRSTS

**IN 2015, THE STATE GOVERNMENT  
AND ADELAIDE CITY COUNCIL COMMITTED  
TO ADELAIDE BECOMING THE WORLD'S  
FIRST CARBON-NEUTRAL CITY.**

**SOUTH AUSTRALIA WAS THE FIRST  
AUSTRALIAN STATE TO SIGN  
AN INTERNATIONAL AGREEMENT  
TO LIMIT GLOBAL WARMING TO  
UNDER 2 DEGREES CELCIUS.**

**IN 2007, SOUTH AUSTRALIA WAS  
THE FIRST AUSTRALIAN STATE TO  
LEGISLATE A SPECIFIC TARGET TO  
REDUCE GREENHOUSE GAS EMISSIONS.**

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# TRANSITION OF ENERGY SUPPLY

A decade of policy uncertainty at a national level has led to under-investment in energy generation.

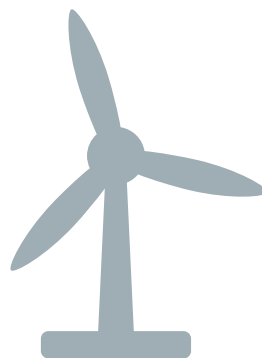
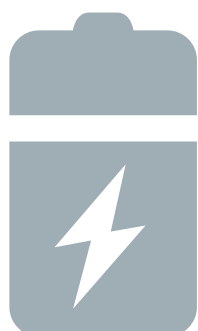
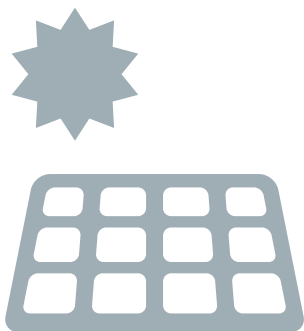
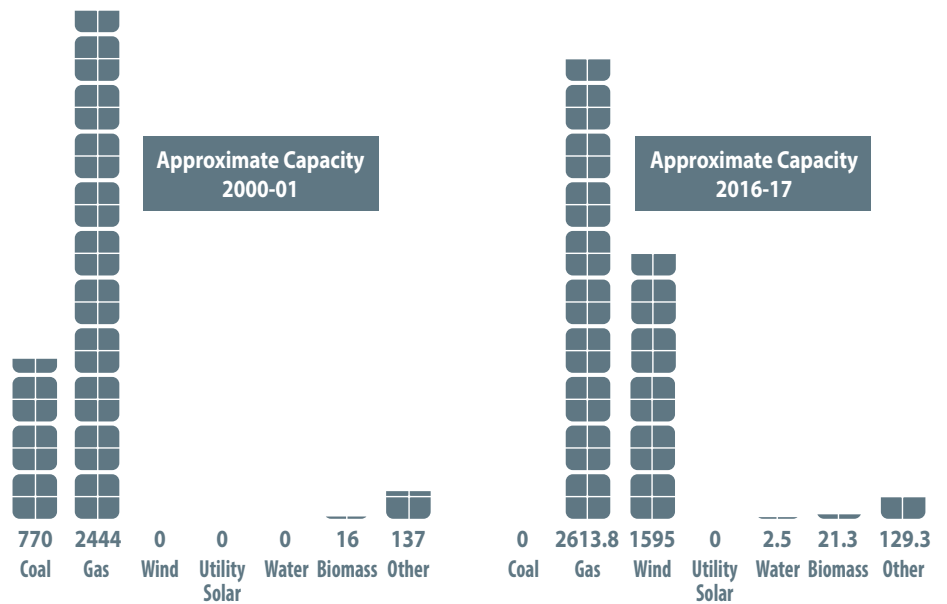
This followed the privatisation of South Australia's electricity assets in 1999, which was done in a way that stifled competition and prevented interconnection with New South Wales.

As a result, the South Australian part of the National Electricity Market is now dominated by a small number of power companies.

It has also led to greater instability in the South Australian market as more efficient local gas-fired generation has been excluded in favour of dirtier coal-fired generation in Victoria.

The combination of these factors has led to higher prices, less stability and a dirtier source of generation in South Australia than is necessary.

As outlined in this plan, the State Government will introduce additional measures to underpin the security of South Australia's electricity supply.





# IMPACT OF SEVERE WEATHER ON LOCAL SUPPLY

**With electricity delivered through a privately owned network of above-ground transmission towers, poles and wires, supply is vulnerable to weather conditions and breakdowns.**

Strong winds, lightning and other conditions can cause localised damage to equipment that needs to be repaired before electricity can be safely restored.

South Australia experienced an unprecedented period of extreme weather in 2016, with the State Emergency Service reporting a threefold increase in callouts compared with 2015.

These storms brought down trees which took out powerlines, blacking out homes and businesses. In some locations, homes were without power for days while systems were repaired.

South Australia is not alone in facing the challenges of weather. Other states have experienced similar severe events which have caused widespread damage and power outages.

While powerlines are placed underground in all new residential and industrial developments, about 90 per cent of powerlines remain above ground.

It has been estimated that the total cost to underground the thousands of kilometres of overhead powerlines in South Australia would be more than \$40 billion.

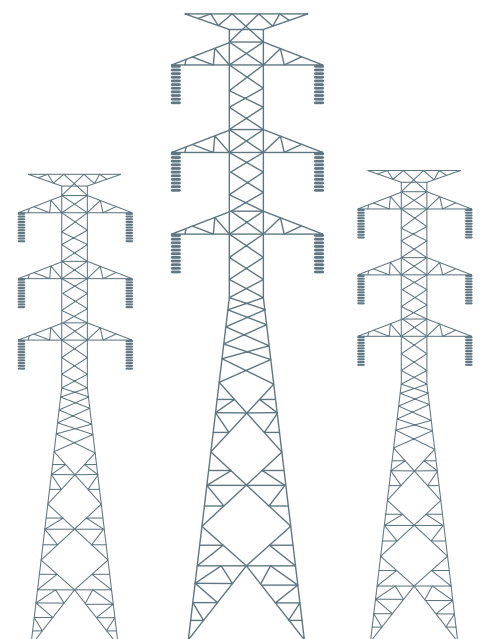
Programs are in place to underground powerlines. South Australia's Powerline Environment Committee (PLEC) assesses and recommends projects. Since PLEC's inception, \$188.6 million of projects have been delivered. In 2015-16, nine projects to underground 5.2km of powerlines were approved.

Trees and vegetation are also a risk to powerlines during severe weather. Legislation requires SA Power Networks to inspect and clear vegetation from around powerlines. This helps to minimise the risk of bushfires, as well as outages during storm events.

The State Government expects the private owners of electricity networks to minimise outages wherever possible and restore electricity as soon as possible in the event of a localised outage.

SA Power Networks is required to make Guaranteed Service Level payments when customers experience excessively long interruptions to supply, or more than 10 days in a financial year.

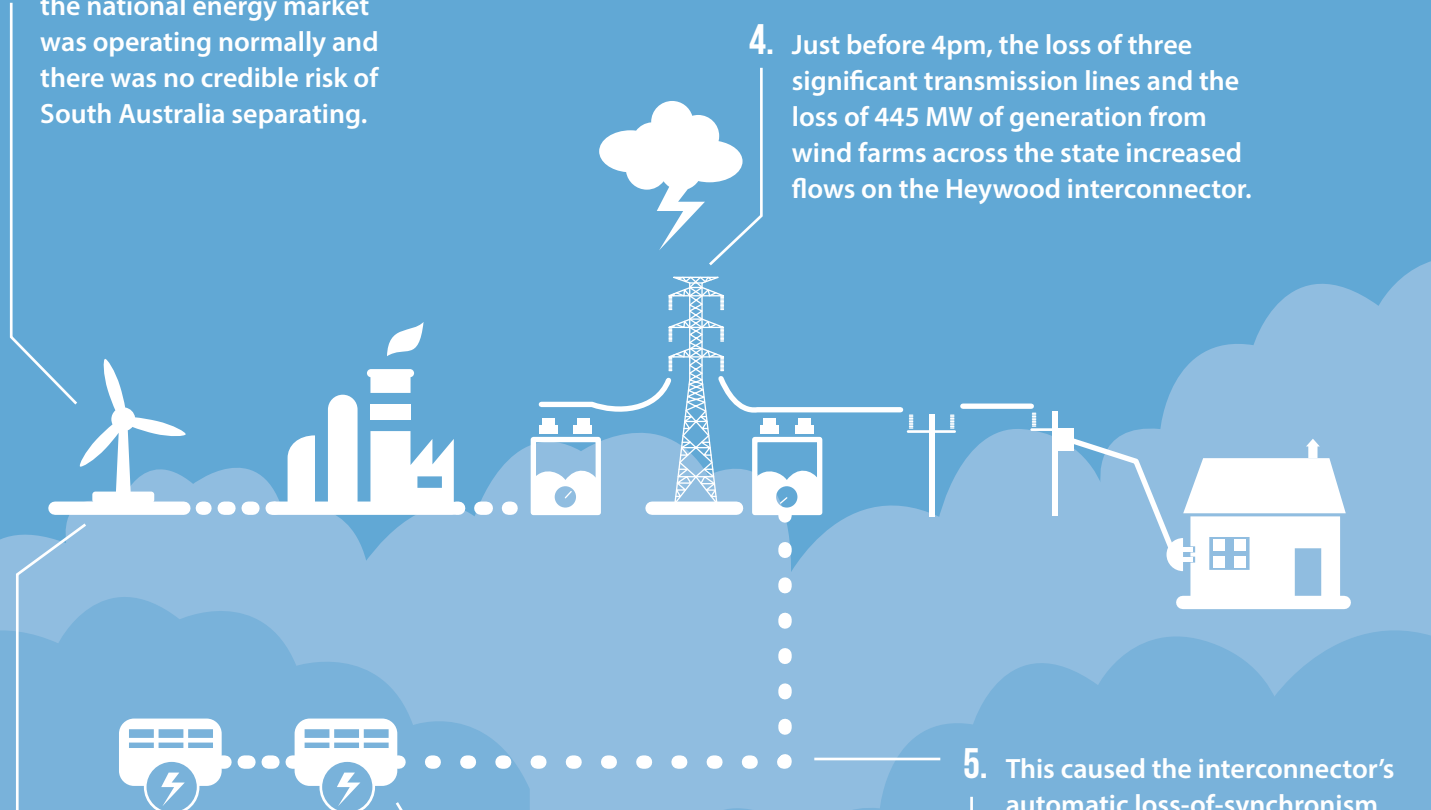
**ELECTRICITY FACTS >  
SA HAS ABOUT 71,000KM  
OF OVERHEAD POWERLINES**



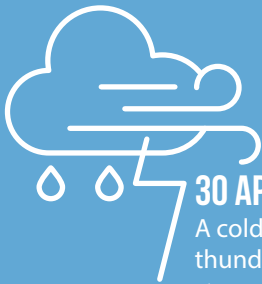
# AUSTRALIAN ENERGY MARKET (AEMO) REPORT

AEMO has released reports into the event of 28 September 2016.

## These reports found:

1. Prior to the blackout, the national energy market was operating normally and there was no credible risk of South Australia separating.
  2. Immediately before the power outage, the generation mix for South Australia consisted of 883 megawatts (MW) of wind, 330 MW of gas, and 613 MW of electricity imported via the Murraylink and Heywood interconnectors.
  3. This generation was serving 1,895 MW of electricity demand from the state's 850,000 customers.
  4. Just before 4pm, the loss of three significant transmission lines and the loss of 445 MW of generation from wind farms across the state increased flows on the Heywood interconnector.
  5. This caused the interconnector's automatic loss-of-synchronism protection to kick in, which disconnected it from South Australia, to prevent damage.
  6. This meant a loss of 900 MW of supply from the Heywood interconnector, which could not be met by the remaining operating generation in South Australia.
  7. The Murraylink interconnector remained connected up until the South Australian system disconnected.
  8. Frequency across the system dropped faster than the under frequency load shedding scheme could act, which resulted in a power blackout.
- 
- An infographic illustrating the power supply chain in South Australia. At the top, a wind turbine, a gas power plant, and a battery storage unit are connected to a high-voltage transmission tower. A lightning bolt icon is positioned above the tower, indicating a power outage event. Below the tower, a dashed line represents the transmission line leading to a house. At the bottom, two buses are shown, connected to the transmission line. The infographic is set against a background of stylized clouds.

# SIGNIFICANT STORM AND WIND EVENTS IN 2016-17



**30 APRIL - 03 MAY**

A cold front with thunderstorms and strong winds caused power outages to 5000 homes across Adelaide.



**21 JUNE**

A cold front moved through Adelaide's southern suburbs, with one storm spawning a tornado that toppled trees and caused roof damage to seven homes along a 3.5km path in Hallett Cove and Reynella.



**08 & 09 MAY**

A large, intense low-pressure system brought strong and damaging winds to the Eyre Peninsula and northern agricultural districts.



**09-13 JULY**

Strong winds from a low-pressure system and cold fronts caused widespread damage and power outages to 120,000 homes in South Australia.



**25 JULY**

A tornado caused tree and roof damage along a 2.7km long track through the Adelaide suburbs of Somerton Park and Glengowrie.



**AUGUST**

Two significant weather events brought strong and damaging winds to South Australia.



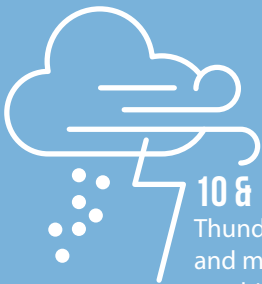
**28 SEPTEMBER**

An outbreak of severe thunderstorms in central Australia caused damaging to destructive winds across large areas, including tornadoes and large hailstones. Destruction of transmission towers contributed to a statewide power outage.



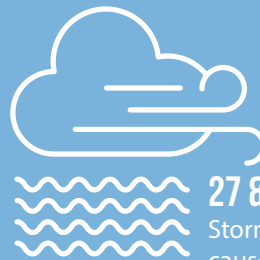
**28 & 30 OCTOBER**

A strong cold front brought strong winds, resulting in 100 calls for assistance to the State Emergency Service and 1200 properties losing power.



**10 & 11 NOVEMBER**

Thunderstorms developed in the Far North and moved across the Eyre Peninsula, reaching Adelaide about 4.30pm on 11 November. The severe storm caused golf ball-sized hail in the northern and eastern suburbs and damaging winds.



**27 & 28 DECEMBER**

Storms on the night of 27 December caused widespread power outages and damage to orchards in the Adelaide Hills as well as flash flooding. The SES received more than 1000 calls for assistance, mostly regarding fallen trees.



**19 JANUARY**

A cold front with thunderstorms and strong winds caused power outages to 58,000 homes across Adelaide.



**8 FEBRUARY**

Hot weather caused a shortfall in supply forcing the Australian Energy Market Operator to order load shedding. More than 90,000 homes were load shed which was three times the amount necessary.

# AFFORDABILITY FOR SOUTH AUSTRALIANS

## Electricity affordability is an important issue for South Australians.

The State Government is conscious of balancing reliability against affordability of electricity. Initiatives to get more competition into the market as soon as possible to help put downward pressure on prices are a priority.

The Australian Energy Market Commission looks at electricity price trends. Its 2016 report says an annual average increase of 2.4 per cent is expected in South Australia from 2016-17 to 2018-19. That is the third-lowest rise in Australia and compares with the highest of 9.3 per cent in the Australian Capital Territory.

The State Government has taken action to deregulate the retail energy market to increase competition and help push down prices. As a result, about 85 per cent of South Australians are now saving money through a market offer.

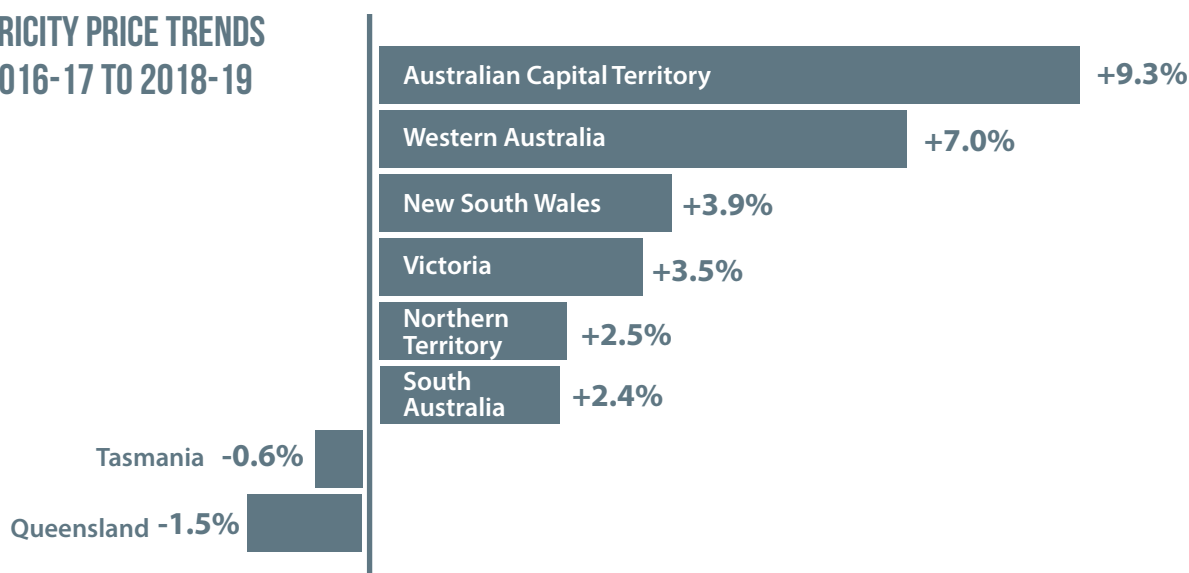
Modelling shows the average customer would have saved \$206 on their electricity bill in 2015-16 by switching from a standing offer to a market offer.

The State Government has also appealed against attempts by SA Power Networks to raise more revenue from South Australian customers.

## SOUTH AUSTRALIAN STANDING AND MARKET OFFERS FOR A REPRESENTATIVE CUSTOMER

South Australia	2015-16
Standing offer total annual bill	\$1693
Market offer total annual bill	\$1487
Saving by switching to a market offer	\$206 or 12%

## RESIDENTIAL ELECTRICITY PRICE TRENDS ANNUAL AVERAGE 2016-17 TO 2018-19



# ELECTRICITY IN SOUTH AUSTRALIA

In South Australia, a network of private companies provides South Australian homes, businesses and communities with power.

ElectraNet is responsible for the transmission lines, and SA Power Networks owns the poles and wires that distribute electricity to customers.

## HOW IS OUR ELECTRICITY GENERATED?

A significant proportion of South Australia's electricity is generated from gas.

Electricity is also generated from renewable sources – the sun through solar systems and wind through wind farms. More than 187,000 South Australian households – or 30 per cent – have solar systems.

A small amount of electricity supply comes from diesel-fired power stations, generally used for remote communities and during peak periods.

When there is high demand, electricity can be moved between states through interconnectors that link Queensland, New South Wales, Victoria, Tasmania and South Australia.

South Australia's two interconnectors are Murraylink (Riverland) and Heywood (Limestone Coast). Both connect the state to Victoria.

## HOW IS OUR ELECTRICITY DELIVERED TO HOMES AND BUSINESSES?

Electricity is transported over long distances from generators to homes, businesses and communities across South Australia.

This happens through a network of transmission towers, high-voltage wires and substations that reduce voltage so electricity can be safely delivered through powerlines to customers.

## HOW IS OUR ELECTRICITY SOLD TO CUSTOMERS?

Generated electricity is sold through the National Electricity Market to electricity retailers, which then sell it to households and businesses.

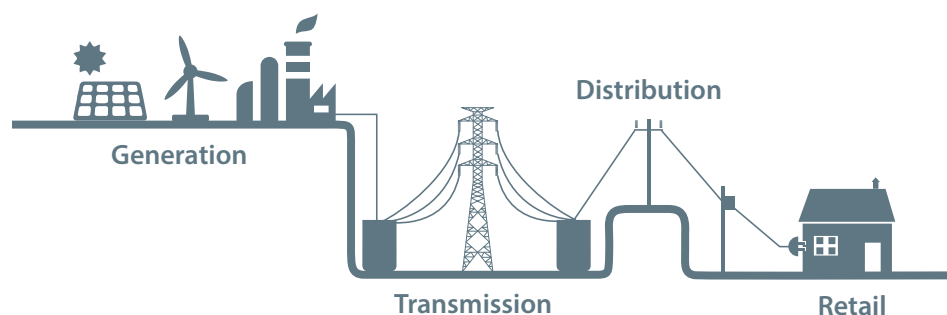
The Australian Energy Market Operator, a Federal body owned by the Federal Government and states and territories that make up the market, oversees the national market.

## WHAT COSTS ARE INCLUDED IN POWER BILLS?

Power bills cover the various costs of electricity:

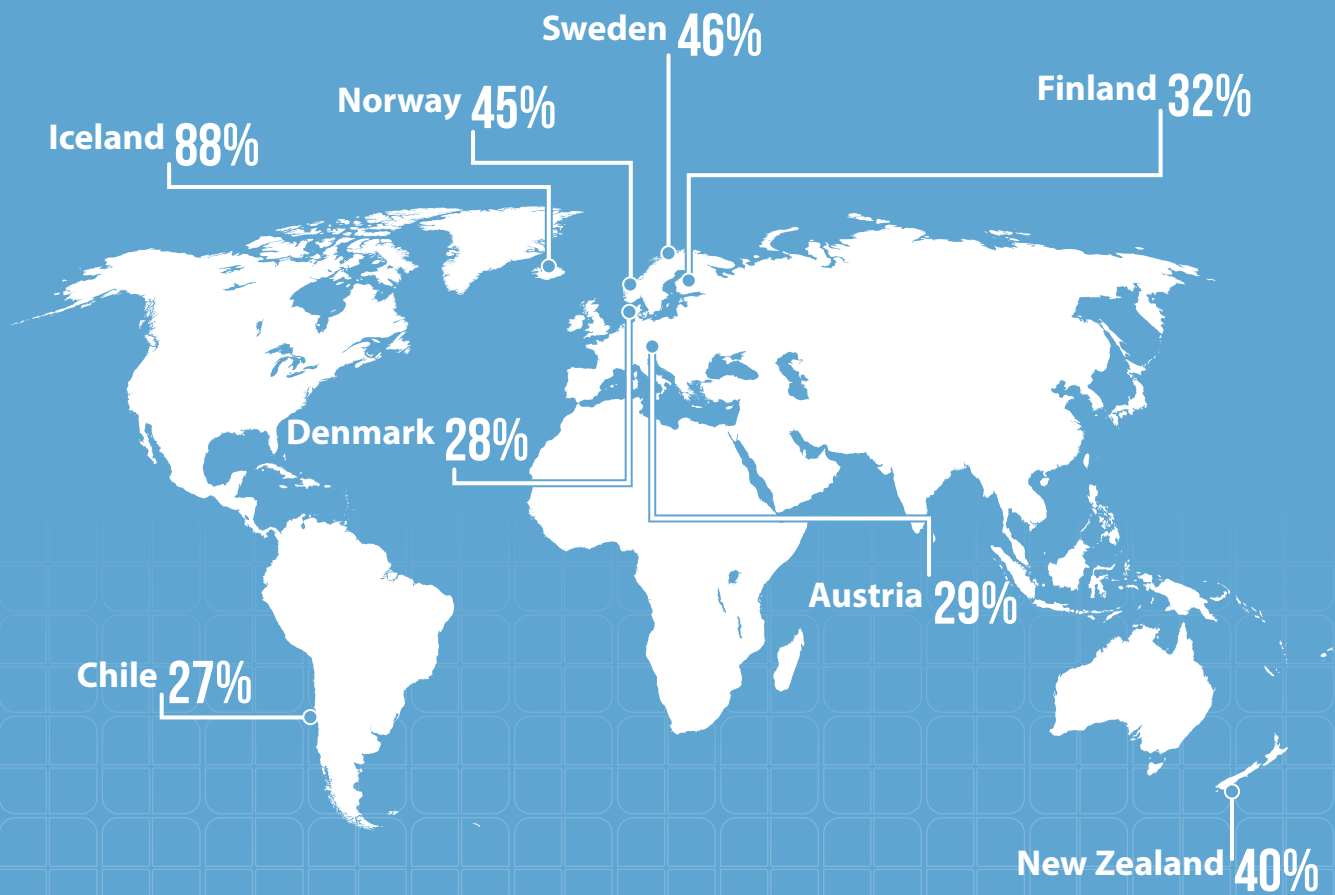
- wholesale costs – the cost to purchase from the national market
- network costs – the cost to transmit and distribute electricity (set every five years)
- retail costs – the cost associated with retailing electricity
- green costs – the cost associated with providing green energy

About 42 per cent of the average power bill was made up of transmission and distribution costs in 2016-17.



## RENEWABLE ENERGY AROUND THE WORLD

Percentage of primary energy supply derived from renewable energy sources in 2015.



## RENEWABLES IN SOUTH AUSTRALIA

### WIND

South Australia currently hosts 35 per cent of the nation's installed wind capacity, with wind farms dotted across the state.

### SOLAR

South Australia was the first place in Australia to introduce solar feed-in legislation. This led to the highest per capita take up of household solar power in Australia. The scheme closed in 2013.

### GEOTHERMAL

Geothermal generation – energy from heat stored in the earth – is attracting significant interest and could contribute significantly to the state's energy requirements in the future.

### HYDROGEN

Hydrogen can be produced from renewable energy resources and is considered a clean energy storage technology. The State Government is developing a road map in this area.

## RENEWABLE STORAGE TECHNOLOGY EXPLAINED

Renewable storage is cutting-edge technology that helps to provide stable and secure energy supplies.

Storage allows electricity to be captured and provided at peak times when demand exceeds production, such as when the wind is not blowing or a hot day creates a huge peak in demand.

This is particularly useful in a place like South Australia, which has significant generation from the wind and sun.

Large-scale batteries add significant benefits to the grid through fast-frequency system response.

## BATTERY STORAGE

Grid-scale batteries are being used in other countries to store power for use at times it is needed. The batteries capture energy generated by the sun or wind on a large scale.

## PUMPED HYDRO

This type of hydropower works like a battery. Water is pumped from a lower to an upper reservoir for storage and then released back down to generate power when it is needed.

## BIOMASS

Biomass fuel is developed from renewable organic waste such as scrap lumber, forest debris, certain crops, manure and some types of waste residues. This material is burned to produce steam that runs a turbine to make electricity.

## SOLAR THERMAL

Solar thermal technology captures energy from the sun to generate heat. This can be stored and converted to electricity.

## OUR GREEN ENERGY TARGETS

**50%**  
OF ELECTRICITY  
FROM RENEWABLE  
SOURCES  
BY **2025**

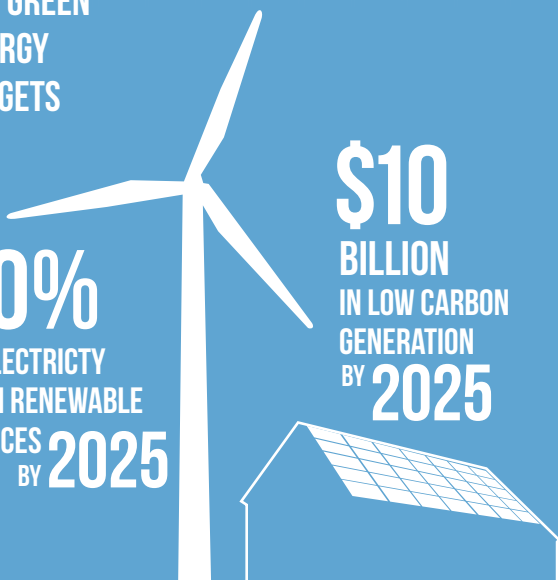
**\$10**  
BILLION  
IN LOW CARBON  
GENERATION  
BY **2025**

ACHIEVE NET  
**ZERO**  
EMISSIONS BY  
**2050**

ESTABLISH ADELAIDE  
AS THE WORLD'S

**FIRST**

CARBON NEUTRAL CITY



# STATE GOVERNMENT PROGRAMS

South Australians have a proud history of self-reliance when it comes to running their households.

The state has the highest proportion of households with rainwater tanks in the nation. It also has one of the highest proportions of households with solar panels, at about 30 per cent, to supplement electricity supply.

Various concessions and programs are supporting tens of thousands of South Australians each year with their energy needs. Find out more about concessions at [www.sa.gov.au](http://www.sa.gov.au).

## ENERGY BILL CONCESSIONS — HELPED 192,000 SOUTH AUSTRALIANS IN 2015-16

The State Government provides concessions of up to \$215 a year to people who are eligible for assistance with electricity and gas bills.

## COST-OF-LIVING CONCESSIONS — HELPED 183,000 SOUTH AUSTRALIANS IN 2015-16

Concessions of up to \$200 per household are available to pensioners, low-income earners and self-funded retirees with a Commonwealth Seniors Health Card who either rent or own and live in their home.

## MEDICAL HEATING AND COOLING CONCESSION — HELPED 2600 SOUTH AUSTRALIANS IN 2015-16

South Australian adults or children who have a qualifying medical condition that requires heating or cooling to manage may qualify for an extra concession of \$215 per year.

Concessions card holders and those on a Commonwealth allowance or benefit are eligible.

## EMERGENCY ELECTRICITY PAYMENT SCHEME

Households that have had their electricity disconnected and are at risk, or are having extreme trouble paying their bill, may be eligible for a payment of \$400 every three years. The assistance is available only through financial counsellors.

## ENERGY EFFICIENCY AUDITS

People can do their own audit of energy efficiency, with information available at [www.sa.gov.au](http://www.sa.gov.au). Those on low incomes may be eligible for a free energy audit through their energy retailer.

The Retailer Energy Efficiency Scheme is an initiative of the State Government to help households and businesses save on energy use and costs, and lower their emissions.

Retailers are also required by law to help customers experiencing payment difficulties to better manage their energy bills.

## SWITCH AND SAVE

Private companies are responsible for the price of electricity. Customers can compare offers from electricity retailers.

South Australians on a market offer rather than a standing offer could be saving about \$200 a year on their electricity bills.

People keen to find the best electricity deal or tips to reduce their electricity bill can go to [www.energymadeeasy.gov.au](http://www.energymadeeasy.gov.au).

## CREATING JOBS AND SA SUCCESS STORIES

### Tindo Solar

Tindo Solar was founded in 2011. Based in Mawson Lakes, Tindo is Australia's only solar panel manufacturer and is focused on creating Australian jobs in the advanced manufacturing sector.





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# ENERGY - THE FACTS

**MYTH: THE STATE GOVERNMENT  
CLOSED THE NORTHERN POWER STATION  
AT PORT AUGUSTA.**

**FACT: ALINTA ENERGY, A PRIVATE  
COMPANY, MADE A BUSINESS DECISION TO  
CLOSE THE POWER STATION.**

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**MYTH: RENEWABLE ENERGY CAUSED  
THE STATEWIDE POWER OUTAGE  
IN SEPTEMBER 2016.**

**FACT: THE OUTAGE WAS TRIGGERED BY  
TORNADOES TAKING OUT HIGH-VOLTAGE  
TRANSMISSION TOWERS. THE SYSTEM  
SHUT DOWN TO PROTECT EQUIPMENT  
FROM DAMAGE.**

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**MYTH: CLEAN COAL IS A  
SUITABLE ALTERNATIVE TO GAS AND  
RENEWABLE ENERGY.**

**FACT: GAS AND RENEWABLE ENERGY IS  
FAR CHEAPER AND CLEANER THAN  
CLEAN-COAL TECHNOLOGY.**

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# WHAT INDUSTRY LEADERS AND EXPERTS ARE SAYING

## Industry has been particularly affected by higher prices and a lack of contracts in the network.

There is a consensus that wide-ranging reforms are urgently needed at a national level.

*"A failure to advance reform of the NEM, to improve the resilience of the system and better integrate renewables, will heighten the risk of repeated events like the blackout in South Australia, to the detriment of energy consumers and the economy as a whole."*

Preliminary Report of the Independent Review into the Future Security of the National Electricity Market.

*"These events provide a preview of the future if decisive action is not taken to manage the transition effectively. Some regions of the NEM, like South Australia, are already exposed to challenges associated with the transition. If we do not act soon the rest of the NEM will also face security issues related to declining coal generation and*

*limited gas supply. Nothing less than a national commitment to these system integration challenges is required."*

Preliminary Report of the Independent Review into the Future Security of the National Electricity Market.

*"The problem with coal comes down to its affordability, the emissions it puts out, its flexibility and its bankability. And you cannot find any serious investor who is looking to invest in coal at the moment given the economics behind it."*

Innes Willox, Chief Executive Officer of the Australian Industry Group.

*"The decarbonisation and modernisation of the electricity sector will span several decades and a long-term vision and trajectory for this transition is essential to ensuring continued investment in low or zero-emissions energy sources and the orderly phase-out of existing emissions-intensive power stations."*

AGL chief economist Tim Nelson, said in AGL's submission to the Finkel review.

*"Whether we're talking about an investor backing new, cleaner generation to replace coal or a business entering a long-term energy contract, it comes down to one thing - confidence. The energy industry doesn't have it and our energy system is on life support without it."*

Catherine Tanna, Managing Director, Energy Australia.

## Assessment of SA energy reform package by Frontier Economics:

*"The government's suite of policy measures provides a technically and cost effective response to the immediate and long term needs in terms of power system security and reliability. Moreover, the suite of measures have been designed to be as consistent as possible with the operation of the market and the competitive tender processes associated with the acquisition of new plant will ensure the government receives value for money. Finally, the suite of measures will ensure greater competition and will, once the competitiveness of the market improves through the effects of the policies, lower prices to consumers than otherwise and absolutely."*



FOR MORE INFORMATION VISIT

**ourenergyplan.sa.gov.au**

"South Australian power  
for South Australians"



Government  
of South Australia

[ourenergyplan.sa.gov.au](http://ourenergyplan.sa.gov.au)