

INVESTING IN REGIONAL AUSTRALIA

The Australian Renewable Energy Agency (ARENA) has worked hard to support more than 500 projects – including renewable energy research, technologies and businesses – since it was first set up in 2012.

We continue to fund projects along the innovation chain from R&D to pre-commercial deployment. These investments include cutting edge research to improve the efficiency of solar cells, feasibility studies for major projects like Snowy 2.0 and Tasmania's second interconnector, through to the roll-out of grid-scale batteries and innovative bioenergy plants.

ARENA works to ensure public funds are leveraged to achieve the best project outcome and also helps grant recipients attract private and public sector investment.

As these projects are often cutting edge, any insights gained (whether the project is successful or not) are shared to ensure the industry learns and advances together.

When making funding decisions we ask:

- is the project innovative?
- is there a pathway to making it commercial?
- will it help unlock future investment across the sector?

While ARENA's focus is providing a pathway for emerging renewable energy technologies to be commercialised, other benefits include direct employment opportunities and increased economic activity.

In total, about 8200 direct and indirect jobs have been created by regionally-funded ARENA projects, as well as long-lasting impacts in terms of upskilling local workers and helping to create local supply chain opportunities.

ARENA was instrumental in establishing large scale solar in Australia and now our investment focus is on:

- helping manufacturing, the resources sector and other industries save money and reduce emissions
- supporting the fledging hydrogen sector (in line with the National Hydrogen Strategy) that could see Australia emerge as a major renewable energy exporter
- continuing to improve grid stability and reliability by investing in ways to use, store, manage and share renewable energy more effectively.

ARENA's investment in renewable energy isn't just for businesses. We are keeping consumer interests front and centre by looking at how the rooftop solar boom (coupled with an expected uptake in home batteries and electric vehicles) will benefit everyone.

Reducing electricity bills and ensuring consumer energy assets can be coordinated to work together in a transparent way is a key driver.

Advances in these areas means ARENA can help the sector avoid the need for expensive infrastructure upgrades and ensure renewable power is available when and where it's needed.

ARENA plays a unique role in supporting relatively higher risk, pre-commercial technologies. Our grant funding allows these projects to proceed by bridging the gap between the project return and the hurdle rate of commercial investors (including the Clean Energy Finance Corporation).

Our impact is demonstrated in how we are ensuring Australian businesses and consumers have the right tools, knowledge, technology options and business models to deliver secure and reliable renewable energy in the long-term.

We've made a good start but there's plenty more to do!



A SNAPSHOT OF OUR WORK

MSM MILLING New South Wales



Australia's first large-scale food manufacturers to use biomass for thermal energy saving an estimated 70 per cent on their energy costs

Founded by two brothers in 1991, the company has grown to supply markets all around the world. Their canola oil is used in popular biscuits, cereals, snack bars, and even Australian KFC stores.

Employing 70 people and located 300 kilometres west of Sydney, the Manildra plant is not connected to the gas grid. Historically they have been forced to truck in LPG, but faced with rising transport costs and variable gas prices they began exploring alternative fuel sources.

ARENA's support has helped MSM Milling become one of Australia's first large-scale food manufacturers to use biomass for thermal energy-saving an estimated 70 per cent on their thermal energy costs.

BUNDABERG REGIONAL IRRIGATORS GROUP Queensland



Pumping costs on the trial farm are down from \$116 per megalitre before the project began, to just \$23.14 per megalitre with the hybrid solar system

In the search for a cost-effective, reliable solution to increasing power bills, the Bundaberg Regional Irrigators Group (BRIG) has worked with ARENA to trial a new hybrid system powered by energy from solar panels installed at a local family's sugarcane farm, which is delivering promising early results.

Describing the switch as the "next step", BRIG members embraced solar after installing a range of other technologies to monitor weather and environmental factors, including probes to monitor soil moisture in real time across the district.

Pairing an 82.5 kW solar array with a new 45 kW motor and pump unit, the trial has reduced demand for grid power by 78 per cent. Early results show pumping costs on the trial farm are down from \$116 per megalitre before the project began, to just \$23.14 per megalitre with the hybrid solar system.

NORTHERN OIL ADVANCED BIOFUELS Queensland



Opening up the potential for sewage sludge across the country to be converted into oil that can in turn be refined into diesel

The masses of sludge left over from sewerage and wastewater processing could be refined into renewable diesel and aviation fuel as part of an ambitious plan being undertaken at Southern Oil's Northern Oil Advanced Biofuels Pilot Plant in Yarwun (outside of Gladstone).

A biofuel and biocrude laboratory was constructed at the site in 2015 with funding from ARENA and the Queensland Government. Southern Oil Refining have used the laboratory to determine the best ways to make useable biofuel from biocrudes, as well as undertake research to inform their entrance into the commercial fuels markets.

ARENA is providing funding for the two-year pilot that could be ratcheted up to a commercial scale, if the demonstration project goes well – opening up the potential for sewage sludge across the country to be converted into oil that can in turn be refined into diesel.

LATROBE VALLEY VIRTUAL MICROGRID Victoria



A trial designed to test the feasibility of a local energy marketplace that hopes to save money for farmers and increase generation from renewable energy sources in the Latrobe Valley

ARENA provided funding for the Latrobe Valley Microgrid, a trial designed to test the feasibility of a local energy marketplace that hopes to save money for participants and increase generation from renewable energy sources in the Latrobe Valley.

The drop in energy consumption between milkings in the middle of the day is an opportunity for farmers to sell excess power back to the grid, potentially reducing their energy costs and creating a valuable new revenue stream for farmers.

The local energy marketplace is using a blockchain-based transactive platform developed by LO3 Energy to provide visibility over the microgrid's location and capacity and quickly identify any potential security risks.

SETUP Northern Territory



This four-year Solar Energy Transformation Program (SETuP) is bringing solar energy to 26 remote off-grid communities across the Territory

With funding from ARENA and the NT Government, the four-year Solar Energy Transformation Program (SETuP) project is bringing solar energy to 26 remote off-grid communities across the Territory.

The SETuP program builds a platform for renewables to launch from, growing the local industry and providing an evidence base to inform future rollouts.

Daly River's new PV setup for example has allowed the community to switch off generators during the day, saving 400,000 litres of diesel per year.



**SANTOS
INTEGRATING
RENEWABLES**
South Australia
& Queensland



Santos' trial project will convert 56 crude oil beam pumps, (which are engine powered) to 100 per cent renewable solar photovoltaic (PV) and battery storage systems

ARENA's first off-grid project with the oil and gas industry is helping reduce SANTOS' reliance on diesel and oil through the conversion of 56 remote crude oil beam pumps to solar and batteries in remote South Australia and Queensland.

Aiming to prove the reliability of renewables for this type of operation, the project could provide a blueprint for other resources companies to follow.

The company's own fuel consumption in the Cooper Basin is equivalent to about five per cent of east coast domestic gas demand. If they can extend the use of renewables across their operations, they will also free up more natural gas for sale helping to drive down prices.

**VICTORIAN
LARGE-SCALE
BATTERIES**
Victoria



The Ballarat Energy Storage System (BESS) is capable of powering more than 20,000 homes for an hour of critical peak demand before being recharged

In March 2018, ARENA committed \$25 million to two grid-connected, utility-scale batteries, matching the \$25 million committed by the Victorian Government. The 30 MW / 30 MWh Ballarat Battery Energy Storage System (BESS) has been built at AusNet Services' Ballarat terminal substation, where it is helping deliver critical supply and grid stability and security in a constrained and congestion area of the network – avoiding the need for further network investment.

The battery is capable of powering more than 20,000 homes for an hour of critical peak demand before being recharged.

Under the joint initiative, ARENA has also funded a second large-scale battery in Gannawarra near Kerang.

**PARKES SOLAR
FARM**
New South Wales



Operating at peak output, the Parkes facility generates enough energy to power around 15,000 homes, while increasing the nation's experience in planning and building large scale solar PV

The project is one of 12 large-scale solar PV projects supported by ARENA to increase the nation's experience in planning and building large scale solar PV and making it more competitive by increasing confidence and building supply chains.

By supporting Parkes Solar Farm and other large-scale solar projects (through a \$92 million funding round) ARENA has made the benefits of solar available to more Australian energy consumers.

Operating at peak output, the Parkes facility generates enough energy to power around 15,000 average Australian homes.

**GOULBURN
ABATTOIR
BIOGAS FACILITY**
New South Wales



Abattoir effluent is treated to produce biogas then transferred to two 800 kW dual fuel generators to produce approximately 3800 MWh of electricity per year for use during the manufacturing process to reduce peak electricity consumption

ARENA provided grant funding to ReNu Energy to design, construct, own and operate a biogas facility at Southern Meats' existing abattoir facility. The Goulburn abattoir processes sheep and lambs, using around 20,000 KWh of electricity every day.

The project consists of an anaerobic digestion process, where the abattoir waste is treated in a covered lagoon to biologically break down the effluent to produce biogas.

Biogas is treated and transferred to two 800 kW dual fuel generators to produce approximately 3800 MWh of electricity per year for use during the manufacturing process to reduce peak electricity consumption.

**AGNEW GOLD
MINE**
Western Australia

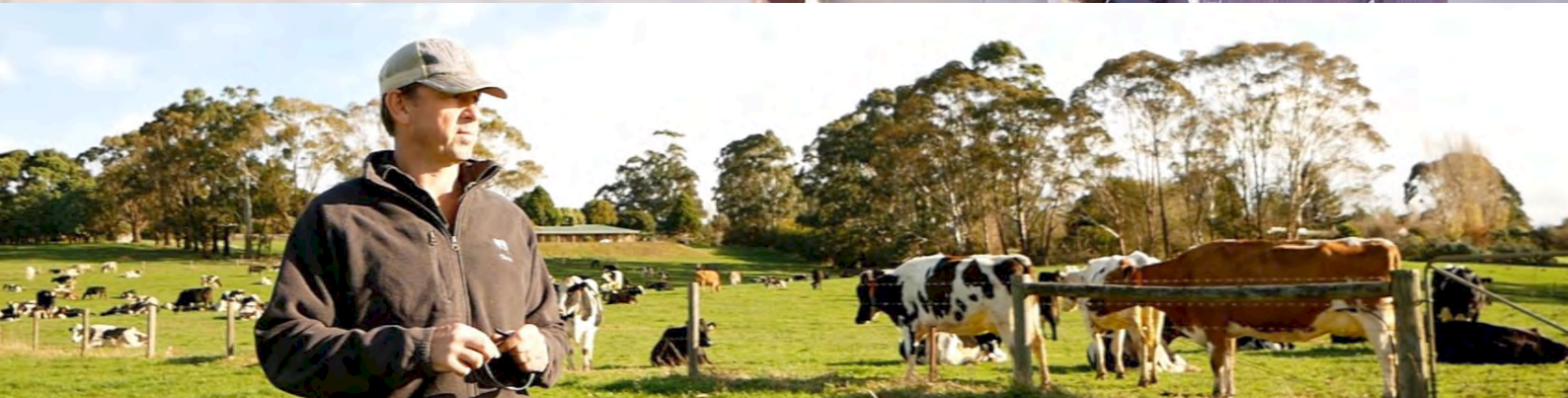


Construction of a wind, solar, battery and gas hybrid microgrid facility at the mine is expected to provide nearly 60 per cent of the mine's total energy requirements, with the potential to meet almost all its energy requirements at certain times.

Gold Fields' Agnew gold mine is already busy constructing the wind, solar, battery and gas hybrid facility at their site 1000 kilometres north east of Perth, which has received \$13.5 million in funding from ARENA.

The microgrid is expected to provide nearly 60 per cent of the mine's total energy requirements, with the potential to meet almost 100 per cent at certain times.

Fringe-of-grid communities in mid-west Western Australia suffer from network outages, so this is a great step forward in creating a template for other electricity users in similar conditions, to replicate and reduce electricity costs and improve reliability and stability.



Images top to bottom:
Southern Oil biofuels | Solar SETuP |
La Trobe Valley Microgrid abattoir biogas facility |
MSM Milling
Cover Image:
Bundaberg Regional Irrigators Group

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