

NSW RENEWABLE ENERGY ACTION PLAN

Annual Report 2016



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Cover image: Moree Solar Farm. (Photo: Fotowatio Renewable Ventures)

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Infographics references:

1. NSW Department of Industry, Skills & Regional Development, as at December 2015.
2. Australian Bureau of Statistics, 4631.0, Employment in Renewable Energy Activities, Australia, 2014-15.
3. NSW Department of Industry, Skills & Regional Development, calendar year 2015.
4. Capacity and investment figures are sourced from the NSW Department of Planning & Environment's major project register and Joint Regional Planning Panels' development and planning register, and compiled by the NSW Department of Industry, Skills & Regional Development, as at November 2016. Due to the process of energy projects progressing through the development phases and planning assessments, the respective totals are subject to change on a regular basis.
5. NSW Department of Industry, Skills & Regional Development, July 2013 - June 2016.
6. Public information from project proponents AGL (Nyngan and Broken Hill Solar Plants) and Fotowatio Renewable Ventures (Moree Solar Farm).
7. Provided by the Australian Photovoltaic Institute using Clean Energy Regulator REC Registry for NSW inclusive of ACT, as at June 2016.
8. Australian Renewable Energy Agency (ARENA), Annual Report 2015-16
9. Clean Energy Finance Corporation (CEFC), Annual Report 2015-16
10. Office Environment & Heritage NSW, Community Attitudes to Renewable Energy in NSW, November 2015 (commissioned research by Newspoll).
11. Australian Energy Market Operator, National Electricity Forecasting Report, June 2016.

Foreword

The Hon. Don Harwin MLC
Minister for Resources, Minister for Energy and Utilities

Ensuring the security of our energy supply is at the core of the NSW Government's energy policy, and increasing the diversity of supply through renewable energy sources is key to our strategy.

Now in its third year, the NSW Renewable Energy Action Plan continues to direct and shape our work to strengthen the state's renewable energy industry, increasing the use of energy from renewable sources at least cost to the energy customer and with maximum benefits to NSW.

The plan positions NSW to be open for business in renewable energy, and ensures this state continues its sustainable transition to a reliable, affordable and clean energy future, in line with our aspirational target of net-zero emissions by 2050.

I am delighted to report that 17 of the plan's 24 actions have now been successfully completed and the remaining seven have progressed substantively.

Over the past six years the percentage of renewable energy in the state's electricity mix has more than doubled. I am proud of our national leadership in large-scale solar, with the country's three largest solar plants now up and running at Nyngan, Broken Hill and Moree. Remarkably, another five solar farms are now expected to be built across regional NSW after receiving funding from the Australian Renewable Energy Agency (ARENA).

Through these actions NSW continues to lead the way in attracting renewable energy jobs, investment and skills while fuelling our economy, supporting our regional areas, and positioning ourselves as an Asia-Pacific hub for clean and renewable technologies.

The government understands that the transition to renewable energy is key to our economic prosperity, environmental sustainability and energy security. In fact, when NSW experienced near record energy demand due to extreme weather on 10 February 2017, renewables provided a critical 27% of generation at the peak.



We now benefit from the highest proportion of direct renewable jobs across the country. The NSW renewable energy industry is picking up speed and I expect further jobs from our substantial project pipeline worth over 8,000 megawatts in capacity and billions in investment.

Our support for a single, national renewable energy target continues, and our efforts to streamline the planning process means we are ideally positioned to attract investment in new projects required to meet our share of the target. Recently, we consulted on additional complementary policy to help achieve and maximise the benefits from the Renewable Energy Target.

We are excited by a number of significant projects underway near Glen Innes. These projects will bring jobs, investment and business activity to the New England region.

The increasing deployment of smart grid technologies, including smart meters and battery storage options, gives customers greater control over their energy usage and offers the potential to increase the reliability of the network.

As we increasingly transition to a more advanced energy system, the NSW Government continues to work with the Council of Australian Governments to ensure we are able to integrate advanced technologies and services that empower customers and reduce electricity prices.

Renewable energy is integral to our future energy mix, and I'm proud NSW is setting the standard for responsibly and sustainably managing the transition of our energy supply.



WIND TURBINE BLADE SHIPMENT ARRIVES AT PORT OF NEWCASTLE DESTINED FOR WHITE ROCK WIND FARM IN NEW ENGLAND, NSW. (PHOTO: GOLDWIND AUSTRALIA)

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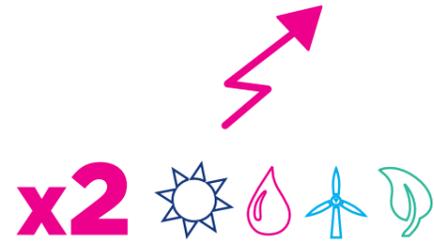
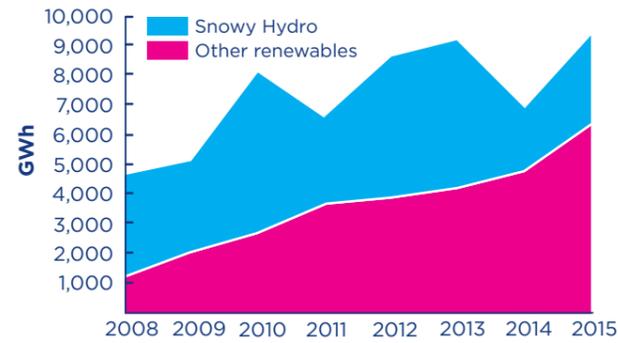
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UNSW ACHIEVED THE WORLD'S HIGHEST EFFICIENCY IN THIN-FILM SOLAR CELLS THIS YEAR WITH A NON-TOXIC AND CHEAP TO MAKE TECHNOLOGY CALLED CZTS CELLS. (PHOTO: UNSW)

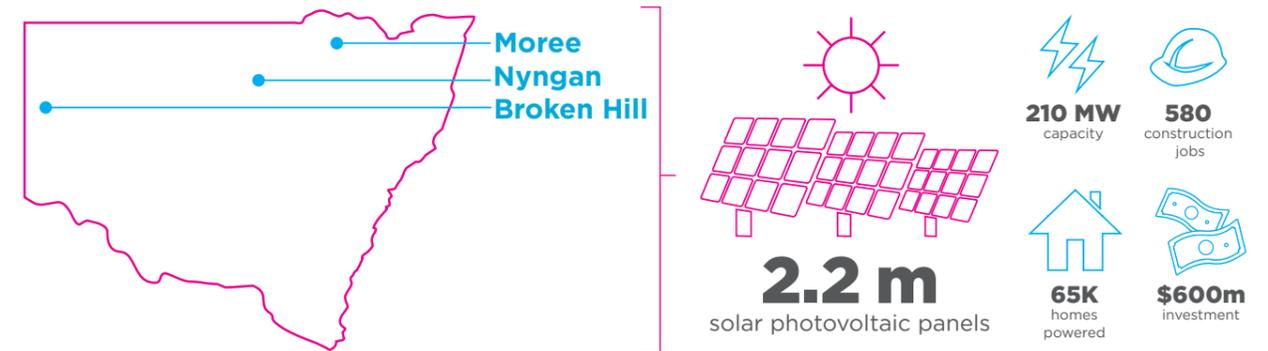
Renewable energy is taking off in NSW

Historical trends in renewable energy generation in NSW¹



Over the past six years, the share of renewables in the NSW electricity mix has more than **doubled**.

NSW leads Australia in large-scale solar



Renewable energy supports jobs in NSW

NSW had the highest proportion of direct renewable energy jobs in Australia in 2014-15²



Wind farm milestones in NSW



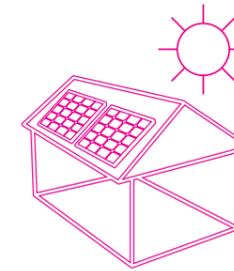
NSW customers recognise the benefits of solar⁷

350K

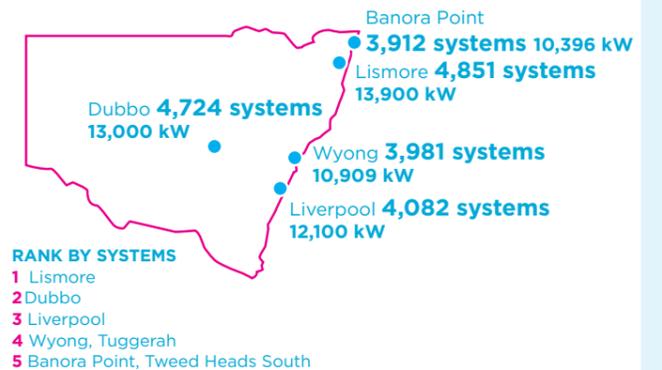
rooftop solar systems on homes in NSW

15%

percentage of NSW homes that have adopted rooftop solar



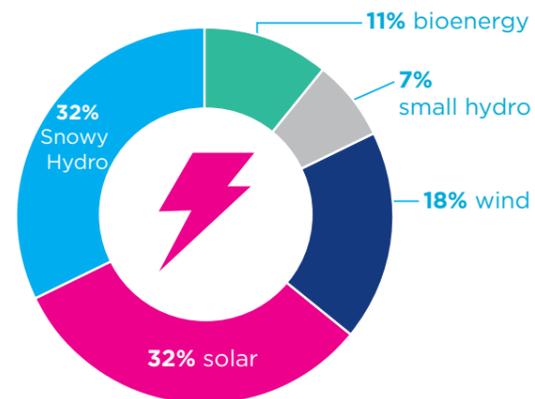
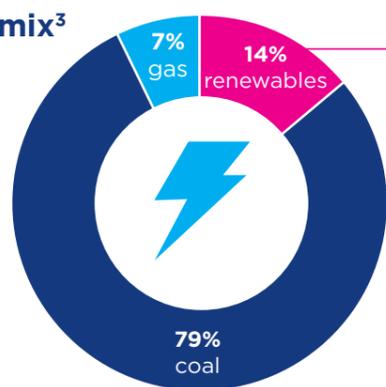
Rooftop solar is popular in regional NSW and Western Sydney⁷



NSW electricity mix³

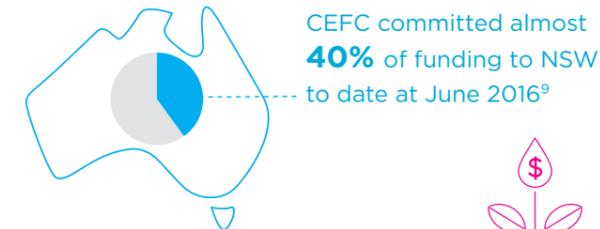
Renewable energy made a record-breaking contribution to the mix in 2015 at

14%



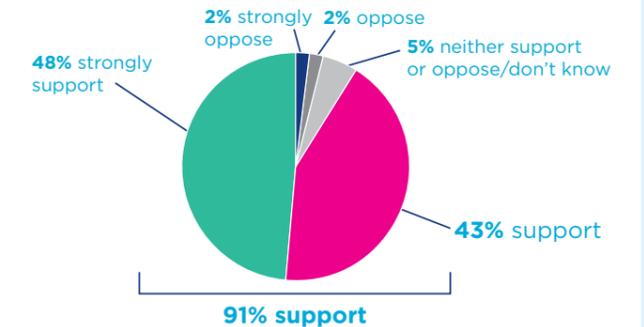
Diversity in the mix promotes energy security

NSW has attracted significant Commonwealth funding in clean energy



ARENA committed **half** of funding to NSW in 2015-16⁸

Overwhelming public support for renewable energy in NSW¹⁰



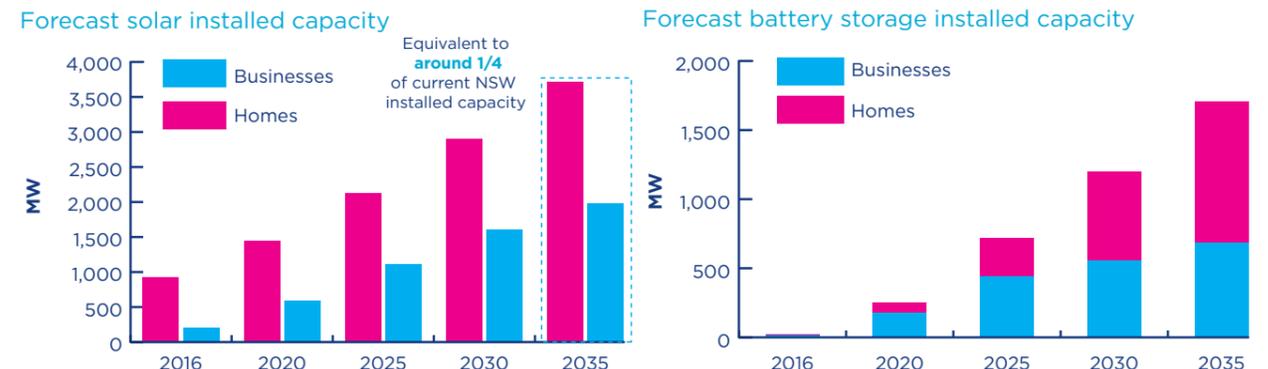
Renewable energy is a shovel-ready industry in NSW⁴



NSW helps major projects progress⁵

targeted facilitation services for **34** renewable energy generation projects in NSW since July 2013 worth **5,000 MW** and **\$7,800m** of investment

NSW homes and businesses are expected to help power the state¹¹



Key achievements in 2015-16

GOAL 1: Attract renewable energy investment

- The operational electricity use of the state's signature infrastructure project Sydney Metro Northwest will be fully offset by renewable energy from NSW.
- Focused support was provided to the NSW solar farms shortlisted under ARENA's Competitive Round for Large-scale Solar, which ensured that all eight solar farms had planning approval and offers to connect ahead of the application deadline.
- A government tender was launched for renewable energy from around 50 megawatts of installed solar capacity to increase the competitive standing of shortlisted solar farms applying for ARENA funding.
- A streamlined approach to the assessment of solar projects was developed by working closely across government and with stakeholders to proactively address issues, without any compromise on environmental standards or community engagement.
- NSW supported the launch of the Institute for Sustainable Futures' Network Opportunity Maps, which illustrate where renewable energy, energy storage and demand management can be used to meet network constraints.

GOAL 2: Build community support

- A new Wind Energy Development Framework was developed that will ensure NSW has the right settings to attract investment in wind energy, while balancing the interests of the community, with public consultation beginning in 2016-17.
- The government sought to overcome network constraints and reduce costs for customers by contributing \$430,000 towards a feasibility study for a renewable energy hub in the New England Region.
- Strong public support for renewable energy was revealed by a government-commissioned study into community awareness, knowledge and attitudes to renewable energy technologies across NSW.
- Strategic options have been outlined for delivering ownership and benefit sharing models for wind farms in NSW in a report that reviews the international policy landscape.
- GreenPower Connect was launched by the government as a new low-cost product to open up the market for direct bulk purchases of renewable energy over and above the national renewable energy target.

GOAL 3: Attract and grow renewable energy expertise

- The government removed barriers that will enable greater deployment of smart grid technologies through changes to the regulatory framework for the rollout of smart meters.
- NSW supported the Australian portal of the US Department of Energy's Global Energy Storage Database, which will inform investors, developers, and researchers about the latest commercial and utility scale energy storage installations.
- The Hunter Energy Transition Alliance was launched as a collaboration between government, industry, and the community to attract new investment and achieve economic diversity for the Upper Hunter Region.
- The government signed on to support the national mission to fill the information gap and catalyse investment in the bioenergy industry through the Australian Biomass for Bioenergy Assessment.

Action status update



GOAL 1: ATTRACT INVESTMENT	PROGRESS
1. Improve the process of network connection	Progressed
2. Consider a more strategic and integrated approach to assessment of renewable energy projects	Completed
3. Remove technology-specific barriers to investment	Completed
4. Create an online information portal that provides information to investors	Progressed
5. Promote and facilitate investment opportunities with the appointment of a Renewable Energy Advocate	Completed & Continuing
6. Request the Independent Pricing and Regulatory Tribunal (IPART) estimate a benchmark range for a fair price for small-scale generated solar energy	Completed
7. Develop an information package for small-scale solar photovoltaic (PV), solar hot water and wind generation	Progressed
8. Support mid-scale solar PV to enable uptake of solar technologies where they are most cost effective	Progressed
9. Engage with the Commonwealth Government to facilitate construction of the Solar Flagships Program	Completed & Continuing
GOAL 2: BUILD COMMUNITY SUPPORT	PROGRESS
10. Implement NSW Wind Energy Planning Framework	Progressed
11. Engage communities early and effectively in renewable energy projects	Completed & Continuing
12. Facilitate community ownership of five renewable energy projects	Completed & Continuing
13. Promote the benefits to consumers of switching to GreenPower accredited renewable energy	Completed & Continuing
14. Develop a draft NSW Smart Meter Policy	Completed
GOAL 3: GROW EXPERTISE	PROGRESS
15. Investigate opportunities to support renewable energy experience centres and demonstration projects	Completed
16. Conduct renewable energy research roundtables	Completed & Continuing
17. Promote NSW as a leader of research and innovation in renewable energy	Progressed
18. Continue the recently created NSW Energy Innovation Prize	Completed & Continuing
19. Establish a working group to develop an advanced bioenergy initiative	Completed
20. Support research and development in advanced bioenergy applications at the University of New England	Completed
21. Support research into applications of geothermal assisted power generation	Completed
22. Identify opportunities to support the integration of geothermal projects and coal-fired power stations	Completed
23. Support research and development in wave and tidal technologies	Completed
24. Continue to support research and deployment of smart grid technologies	Progressed

Goal 1: Attract investment



Action 1: Improve the process of network connection

CASE STUDY: Opportunities for renewable energy mapped in the electricity network

In a significant step towards meeting the information needs of an increasingly decentralised energy system, researchers at the University of Technology Sydney Institute for Sustainable Futures have developed the Network Opportunity Maps to illustrate areas in the electricity grid where future demand for power is forecast to exceed supply capacity.

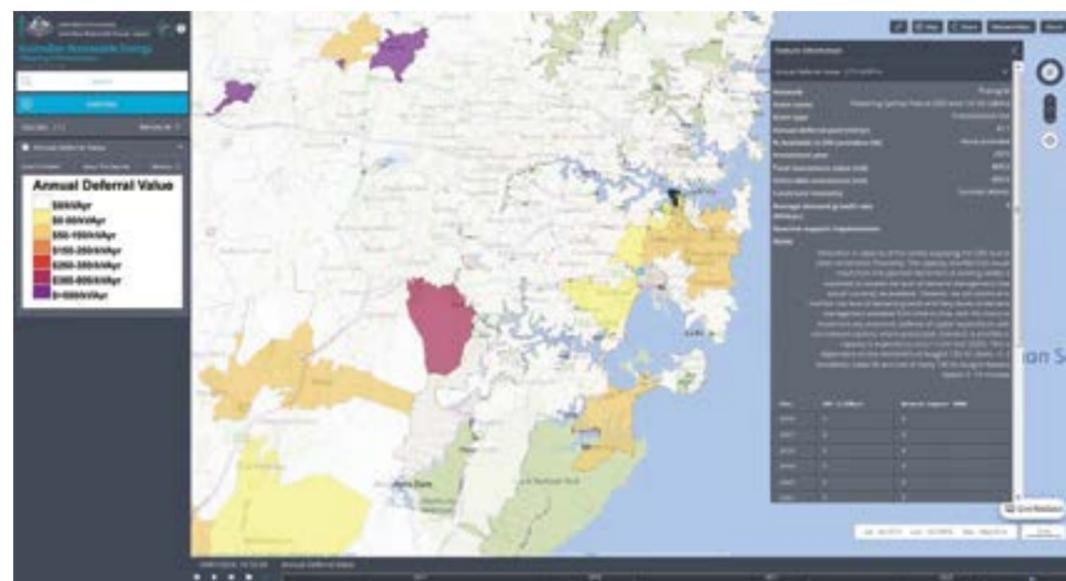
These maps identify the most valuable locations to invest in renewable energy, battery storage and demand management across the National Electricity Market (NEM). By highlighting opportunities to meet network constraints other than network infrastructure investment, the maps will help reduce costs and deliver benefits for NSW customers.

The first full version of the free and publicly available online maps has been released and will be updated annually. Hosted by Commonwealth Scientific and Industrial Research (CSIRO)'s Data61 on the Australian Renewable Energy Mapping Infrastructure (AREMI), the maps will be consistently and transparently applied across all NEM regions.

Ultimately, the maps are expected to be woven into network businesses engagement strategies for demand-side solutions. In 2017, the final stages of the project include releasing the second iteration of the maps, engaging with stakeholders on the opportunities and identifying a suitable ongoing host for the maps.

The NSW Government is a major sponsor of the project, with ARENA providing cornerstone funding. The project included collaborating with the Energy Networks Association and support from every network business in the NEM.

“The NSW Government recognises the value in the Network Opportunity Maps in supporting new energy technologies and services in a rapidly evolving electricity market,” said the Minister for Industry, Resources and Energy, the Hon Anthony Roberts MP.



AUSTRALIAN RENEWABLE ENERGY MAPPING INFRASTRUCTURE (SOURCE: [HTTP://NATIONALMAP.GOV.AU/RENEWABLES/](http://nationalmap.gov.au/renewables/))

Goal 1: Attract investment



Action 5: Promote and facilitate investment opportunities with the appointment of a Renewable Energy Advocate

CASE STUDY: NSW Government used its purchasing power to get renewable energy projects off the ground

This year, the NSW Government has harnessed its commitments to purchase renewable energy and paved the way for future funding initiatives, introducing two initiatives that are helping get new projects off the ground.

First, the government used its own energy use to leverage a share for NSW of ARENA's \$100 million large-scale solar support program.

The government asked its main electricity retailer, ERM Power, to run a tender for renewable energy from the eight NSW solar projects that were shortlisted by ARENA for funding. The tender was limited to installed solar capacity with an output of 50 megawatts (MW), which is equal to around 6 per cent of the Government's forecast annual electricity demand.

By tendering for renewable energy from the NSW projects, the government strengthened the projects' applications in the ARENA process. The NSW Department of Industry will work to finalise contract structures with ERM Power to make offers to the eligible projects in 2016-17 as appropriate.

Second, Transport for NSW (TfNSW) determined that offsetting the operational emissions of the state's signature infrastructure project, Sydney Metro Northwest (SMNW,) would best be achieved by tendering for renewable energy.

TfNSW tendered for 137 gigawatt hours of electricity from renewable energy projects in NSW, which is enough to help a new large-scale project get the financing it needs. SMNW will be Australia's first fully automated, driverless train. The line will include the country's longest railway tunnel and a sky bridge.

These two examples represent a major step for government in delivering on its commitment to increase renewable energy and open up future purchasing initiatives.



ARTIST IMPRESSION OF SYDNEY METRO NORTHWEST. (CREDIT: TRANSPORT NSW)

Goal 1: Attract investment



Action 5: Promote and facilitate investment opportunities with the appointment of a Renewable Energy Advocate

CASE STUDY: NSW leads Australia in large-scale solar

In late 2015, the government hosted a workshop on large-scale solar in NSW to provide industry proponents with a 'one-stop-shop' of information and contacts relating to the development of solar farms in the state. This included information about planning processes, Crown land, network connection and opportunities, ARENA's solar competitive round and Clean Energy Finance Corporation's solar funding program.

Since that time NSW cemented its national lead in large-scale solar in 2016 by commissioning three plants at Nyngan, Broken Hill and Moree. These solar farms are modern energy infrastructure that:

- contribute 210 MW of generation capacity
- power around 65,000 NSW homes with clean electricity each year
- represent a \$600 million investment into regional NSW
- comprise an incredible 2.2 million panels
- supported around 580 jobs during construction.

More recently the government sought to bolster this lead by providing focused support for the eight NSW solar farm projects shortlisted under ARENA's \$100 million Competitive Round for Large-scale Solar.

The NSW Department of Industry played a key role in helping the eight NSW solar farm projects meet eligibility criteria ahead of the funding deadline. This included working with the NSW Department of Planning & Environment to facilitate the process of planning approval, with five of the projects receiving planning approval before the contract due date. It also involved working closely with network businesses to ensure all projects received offers to connect to the electricity grid.

"The support of the NSW Department of Industry was instrumental in allowing Neoen to present competitive bids to ARENA [with the shortlisted Griffith Solar Farm, Parkes Solar Farm and Dubbo Solar Hub]."

Chris Leonard, Head of Solar Development, Neoen Australia

All eight solar projects shortlisted for ARENA funding were granted planning approval and offers to connect by the deadline. ARENA recently announced that a remarkable five new NSW solar farms with a total capacity of 162 MW will receive a combined funding of \$34.9 million under the program. For more information, visit: www.resourcesandenergy.nsw.gov.au/investors/renewable-energy.



BROKEN HILL SOLAR PLANT PRODUCES ENOUGH CLEAN ELECTRICITY TO MEET THE ENERGY NEEDS OF AROUND 17,000 NSW HOMES EACH YEAR. (PHOTO: AGL)

Goal 2: Build community support



Action 11: Engage communities early and effectively in renewable energy projects

CASE STUDY: Seizing the benefits of solar pumping in agriculture

Solar-powered pumping technology has the potential to transform delivery of water for irrigated crops, town water supplies, wastewater treatment plants and stock and domestic needs.

The NSW Regional Clean Energy Program (RCEP) partnered with the NSW Farmers' Association (NSWFA) to develop resources to help irrigators better understand the benefits renewables can bring to their farming operations. This complements the work of Office of Environment & Heritage's Action Matters for Business program, which identified that addressing pumping efficiency is critical to energy saving on farms.

The RCEP team worked with NSWFA, Local Land Services, Landcare, the NSW Renewable Energy Advocate, producer groups and industry associations such as CottonInfo and Cotton Australia to organise 14 workshops throughout regional NSW in 2015-16, as well as seminars and field trips for broad acre irrigators, local government and other groups.

Over 700 people attended the workshops across regional NSW, resulting in greater interest in stand-alone, grid-connected and solar diesel hybrid pumping systems across the state.

"I have seen the benefits of solar pumping first hand in our business, and am excited about the future it will bring to not only my generation, but my children's generation. I envisage that fuel prices will rise again, and we will be in a position that many other farmers won't be with regard to energy prices."

I've talked to many irrigators who had no idea how much it was costing them to extract groundwater, and many whose pump efficiency was terrible. The interest has been amazing and I hope many more people will come on line and install solar.

Andrew Gill, Narromine Farmer

The RCEP team also convenes the statewide Solar Irrigators Working Group, with resources and information produced readily available through the NSWFA Ag Innovators website (www.aginnovators.org.au).



FARMERS LEARN ABOUT PUMP EFFICIENCY AND SOLAR AT A FIELD DAY IN HILLSTON, NSW. (PHOTO: VINCE BUCELLO)

Goal 2: Build community support



Action 12: Facilitate community ownership of five renewable energy projects

CASE STUDY: Cowra investigates biomass for clean power

At Cowra in central west New South Wales, an innovative biomass project is taking shape that could provide a model for other agricultural-based towns. The CLEAN Cowra biomass project demonstrates the NSW Government's commitment to facilitating community ownership of renewable energy projects. When running at full capacity, the biomass project could produce up to 60% of Cowra's energy needs.

As part of the Growing Community Energy grants program, the government granted CLEAN Cowra \$50,000 to develop a high-level project model and fund three feasibility reports into developing the biomass energy system. Cowra Shire Council provided a further \$80,000 to the project.

Biomass systems use microorganisms to break down waste products using anaerobic digestion. The end product is bio-methane, which can be used as a fuel source on its own or harnessed to produce steam and generate electricity.

At Cowra, sludge from the local water treatment plant, green waste from the tip, soiled straw from the local piggery, waste from the abattoir, and horticultural by-products could all form fuel for the biomass energy system.

In addition to its work on the biomass project, CLEAN Cowra has made a significant contribution to the community renewable energy sector by providing a scalable model that can be replicated throughout regional NSW. The team have shared their knowledge by actively collaborating with other community energy groups, and contributing to a number of community energy forums, including the annual Bioenergy Australia conference. For more information, visit www.clean.org.au.



CANOLA RAPESEED CROP IN FLOWER NEAR COWRA NSW (PHOTO: GRAHAM JOHNSON)

Goal 2: Build community support



Action 12: Facilitate community ownership of five renewable energy projects

CASE STUDY: Lismore community invests in innovative commercial-scale solar

Lismore Community Solar Farm project is an innovative and ambitious project that demonstrates how community-owned renewable energy projects can be installed on local government premises. Since receiving a Growing Community Energy grant from the NSW Government, it has become Australia's first council-operated and community-funded solar farm initiative.

In just 10 days, the people of the Lismore area showed their commitment to renewable energy by fully subscribing to investment offers, raising funds that will be loaned to Lismore City Council for the installation of two 100 kilowatt solar PV systems.

Both solar farms are expected to be installed by the end of 2016. There will be a floating solar PV array installed on the treatment pond at East Lismore Sewage Plant, forecast to produce around 178 MWh of electricity a year and reduce the council's annual electricity bill by around \$23,000.

A fixed array will also be installed at the Goonellabah Sports and Aquatic Centre. This system is forecast to produce around 138 MWh of electricity a year and realise annual bill savings of nearly \$18,000 for council.

By the formal close of the investment offers in June 2016 there was enough commitment from local investors to build a third solar farm. The community investors will receive both a financial return on their investment and enjoy the many benefits of renewable energy in their region.

This community energy model is now freely available under a Creative Commons Licence for any council and community energy group to use in developing their own renewable energy projects.

Lismore City Council is the first regional council in Australia to commit to making its electricity supply 100% renewable.



FLOATING SOLAR ARRAY IN OKEGAWA CENTRALE JAPAN (PHOTO: © CIEL&TERRE INTERNATIONAL PICTURE)

Goal 2: Build community support



Action 13: Promote the benefits to consumers of switching to GreenPower accredited renewable energy

CASE STUDY: GreenPower Connect opens up the market for bulk renewable energy purchases

Increasingly, entities such as commercial buyers groups are looking to enter into direct relationships with renewable energy projects.



GreenPower Connect is a new product from the National GreenPower Accreditation Program, which is managed by the NSW Government on behalf of participating states and territories. Designed to evolve the program's product range, GreenPower Connect (GreenPower) will better meet Australia's changing market for large voluntary purchases of renewables. The core aim of GreenPower remains the same – drive investment in new Australian renewables.

GreenPower Connect provides a low cost opportunity for direct funders to purchase renewable energy over-and-above the national Renewable Energy Target, increasing the amount of renewable energy in the national grid beyond the mandated targets. The product is targeted at large energy purchasers such as corporates and buyers groups who want to choose specifically where their renewable energy comes from.

As well as lower administration costs, organisations purchasing through GreenPower Connect benefit from the many marketing and reporting opportunities. For example, they are eligible to use the GreenPower Connect customer logo on their business materials to highlight their support for new renewable energy project.

In addition, GreenPower Connect can be used by purchasers to increase their building's performance under the National Australian Built Environment Rating System (NABERS) and Green Star – Performance rating. And because GreenPower purchases equate to zero emissions, GreenPower Connect purchases can be used by organisations aiming to become carbon neutral under the National Carbon Offset Standard. For more information, visit www.greenpower.gov.au.



CAPITAL WIND FARM NEAR BUNGENDORE, NSW, IS A GREENPOWER ACCREDITED GENERATOR. (PHOTO: INFIGEN ENERGY)

Goal 3: Grow expertise



Action 15: Investigate opportunities to support renewable energy experience centres and demonstration projects

CASE STUDY: Fostering economic diversity for the Hunter region in the energy transition

The Hunter Energy Transition Alliance is a collaboration between the NSW Government, industry and the community to attract new investment and achieve economic diversity for the Upper Hunter Region in NSW.

The energy retailer and generator AGL has identified the potential of working together to harness opportunities as Australia's energy system transitions. In NSW, the opportunity exists to contribute to new economic prosperity for the Hunter Valley, in the areas such as new energy technologies, agriculture and manufacturing.

The Alliance is a major project under the Energy and Resources Knowledge Hub, which is a government initiative with the Newcastle Institute for Energy and Resources at the University of Newcastle.

The government and AGL have a shared goal to grow and highlight the Hunter Valley as both a resource and innovation-rich region for economic activity. The knowledge hub brings together industry partners and leading researchers in the key areas of energy, resources, land, water and intensive agribusiness. The Alliance is focused on enabling regional economic transition through fostering industry, engaging research and targeting training.

In addition, a strong consortium of regional stakeholders is on board to drive the process and inform the Alliance on ways forward. It is the beginning of a long-term project to leverage the assets of AGL and the local area to transition the Hunter into an economically diverse, innovation-rich region.

The Alliance is expected to release a pathway forward shortly. For the latest information, visit: www.energyinnovation.net.au/projects/energy-transition-alliance-for-the-hunter-valley.



NEWCASTLE INSTITUTE OF ENERGY & RESOURCES AT THE UNIVERSITY OF NEWCASTLE, NSW. (PHOTO: NIER)

Goal 3: Grow expertise



Action 17: Promote NSW as a leader of research and innovation in renewable energy

CASE STUDY: NSW universities tackle the World Solar Challenge

The World Solar Challenge is one of the world's most high-profile renewable energy events. Teams push the boundaries of technology in a competition to develop an energy-efficient, solar-powered vehicle that will travel 3,000 kilometres from Darwin to Adelaide over a seven day period. Since the first event in 1987, the Challenge has grown to attract 39 teams from 23 countries. The event brings some of the most advanced solar technologies to Australia to showcase progress in engineering and industrial design.

The Challenge is grounded in education and the focus is on innovation and experimentation. The regulatory philosophy for the competition is set in the design parameters, rather than specifying exactly how each parameter must be met. Science and technology evolve, and to encourage the most innovative ideas, so too do the parameters.

For the 2015 event, the NSW Government's Office of Chief Scientist and Engineer sponsored the University of Western Sydney's (UWS) *SolAce* team and the University of New South Wales' (UNSW) *Sunswift* team.

UWS received funding for an array of components and consumables for the vehicle, such as much needed mobile computer equipment to be used for on-race diagnostics and testing by the team. UNSW used the funding to reduce the cost for their carbon fibre material and battery pack.

The initiative creates a platform for students, staff and industry partners to learn, engage and innovate by solving real life problems with engineering and design.

In short, the Challenge fosters innovation in photovoltaic and electric vehicle technology, capturing public interest in renewable technology and turning students from around the globe into world-class engineers. For more information, visit: www.worldsolarchallenge.org.



SUNSWIFT SOLAR-POWERED VEHICLE. (CREDIT: UNIVERSITY OF NEW SOUTH WALES)

Goal 3: Grow expertise



Action 19: Establish a working group to develop an advanced bioenergy initiative

CASE STUDY: Catalysing investment in the bioenergy industry by bridging the knowledge gap

Bioenergy is a complex and emerging industry in NSW. An identified barrier to the industry's progress is a lack of reliable information on the plants and biological materials used to create fuels, otherwise known as biomass feedstocks.

The Australian Biomass and Bioenergy Assessment (ABBA) is a national initiative, sponsored by ARENA, seeking to address this barrier by developing comprehensive biomass mapping across the nation.

ABBA is expected to catalyse investment in the renewable energy sector by assisting decision making for new bioenergy projects and bringing to light the biomass supply chain, right down to the end user. The project has the potential to be used by investors, biomass producers, electricity users and providers, project developers, policy makers and the public.

NSW, through the NSW Department of Industry, is supporting the national mission to fill the information gap for the bioenergy industry. In the first instance, the department has chosen to prioritise collecting data on forestry residues, given the department's expertise in this area. In addition, the department is currently working with the NSW Environmental Protection Authority to determine the amount of organic material in landfills, as well as working with other states to develop calculators for cropping residues.

The ABBA project will be hosted on the Australian Renewable Energy Mapping Infrastructure (AREMI) and is managed by the Rural Industries Research & Development Corporation (RIRDC).



BROADWATER SUGAR MILL, NSW. (PHOTO: JOHN HOLT)

