NSW Renewable Energy Action Plan

Foreword

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Our vision is a secure, affordable and clean energy future for NSW

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Renewable energy provides a pathway to lasting economic prosperity that does not take resources away from future generations and reduces the impact of our activities on the natural environment.

NSW is blessed with abundant resources and a world-class research and development (R&D) capacity for renewable energy. With prices for technologies such as mid-scale solar becoming comparable with peak power prices in some areas, we are seeing profound changes in the way power is generated and distributed.

The NSW Renewable Energy Action Plan positions NSW to be open for business in renewable energy.

I thank all NSW individuals and organisations who contributed to the submissions process and the members of the joint industry-government Renewable Energy Taskforce for their assistance in the preparation of this Plan.

In response to the draft Renewable Energy Action Plan, 112 submissions were received, including 90 from individuals (75 of which were online forum comments) and 22 from organisations (11 from industry, two local councils and nine community organisations).

There was strong support for growing investment in renewable energy in NSW, in particular for the appointment of the Renewable Energy Advocate, improving the network connections process and energy efficiency.

Executive Summary

A secure, affordable and renewable energy future for NSW

This NSW Renewable Energy Action Plan supports the achievement of the national target of 20% renewable energy by 2020. The Plan positions NSW to increase the use of energy from renewable sources at **least cost** to the energy customer and with **maximum benefits** to NSW.

NSW has excellent renewable energy resources. To successfully grow renewable energy generation in NSW we need to address the challenges of the higher cost of renewable energy, the current barriers to investment and community concerns.

NSW is open for business in renewable energy

Our strategy is to work closely with NSW communities and the renewable energy industry to increase renewable energy generation in NSW.

The Plan details the opportunities and actions underway for renewable energy technologies in NSW. Current forecasts show wind energy will deliver the bulk of new renewable generation up to 2020 – being one of the most commercially ready and cost-effective technologies that can be deployed on a large scale.

The Plan also details three goals and 24 actions to most efficiently grow renewable energy generation in NSW:

1. Attract renewable energy investment and projects
2. Build community support for renewable energy
3. Attract and grow expertise in renewable energy technology

Goals

Goal 1: NSW will attract renewable energy investment

The NSW Government is focused on practical steps to remove barriers to investment in renewable energy. We will:

1 Improve the process of network connections
2 Consider a more strategic and integrated approach to assessment of renewable energy projects
3 Remove technology-specific barriers to investment
4 Create an online information portal that provides information to investors
5 Promote and facilitate investment opportunities with the appointment of a Renewable Energy Advocate
6 Request IPART to estimate a benchmark range for a fair price for small-scale generated solar energy
7 Develop an information package for small-scale solar PV, solar hot water and wind generation
8 Support mid-scale solar PV to enable uptake of solar technologies where they are most cost effective
9 Engage with the Commonwealth Government to facilitate construction of the Solar Flagships Project

Goal 2: NSW will build community support

The NSW Government will give the community a say on decisions that affect it and build community support for renewable energy. We will:

10 Implement NSW wind energy planning guidelines
11 Engage communities early and effectively in renewable energy projects
12 Facilitate community ownership of five renewable energy projects
13 Promote the benefits to consumers of switching to GreenPower accredited renewable energy
14 Develop a draft NSW Smart Meter Policy

Goal 3: NSW will attract and grow renewable energy expertise

The NSW Government will attract and grow expertise in NSW and focus on moving renewable energy technologies from R&D to demonstration and deployment. We will:

15 Investigate opportunities to support renewable energy experience centres/demonstration projects
16 Conduct renewable energy research roundtables
17 Promote NSW as a leader of research and innovation in renewable energy
18 Continue the recently created NSW Renewable Energy Innovation Prize
19 Establish a working group to develop an advanced bioenergy initiative
20 Support R&D in advanced bioenergy applications at the University of New England
21 Support research into applications of geothermal assisted power generation
22 Identify opportunities to support the integration of geothermal projects and coal-fired power stations
23 Support R&D in wave and tidal technologies
24 Continue to support research and deployment of smart grid technologies

Contents

Introduction

The NSW Renewable Energy Action Plan positions NSW to grow renewable energy to support the national target of 20% by 2020 at **least cost** to the energy customer and with **maximum benefits** in terms of investment in NSW.

This Plan details the opportunities and actions underway for each of the renewable technologies in NSW. The Plan also details new proposals to most efficiently grow renewable energy, with actions that aim to:

1. Attract renewable energy investment and projects
2. Build community support for renewable energy
3. Attract and grow expertise in renewable energy technology.

A secure, affordable and clean energy future

Our vision is for a secure, reliable, affordable and clean energy future for NSW. We are working towards an energy system that is less polluting and attracts new jobs and investment to NSW at the lowest possible cost. Increasing renewable energy generation is a critical part of our energy solution.

There were some detailed submissions on energy efficiency to the draft plan, such as the Australian Institute of Refrigeration, Air conditioning and Heating (AIRAH), 450ppm and the City of Sydney.

The NSW Government is now separately developing an Energy Efficiency Action Plan, recognising that energy efficiency measures have the potential to deliver bill savings, reduce the need for avoidable spending on electricity supply and place downward pressure on the cost of living. The NSW Government has committed to:

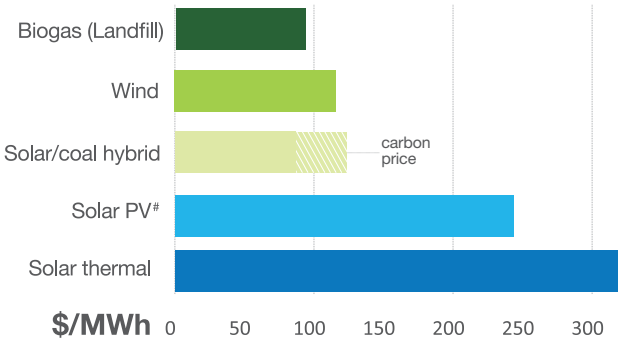
- realise annual energy savings of 16,000 gigawatt hours (GWh) by 2020
- support 220,000 low-income households to reduce energy use by up to 20% by 2014
- deliver high standard building retrofit programs so 50% of NSW commercial floor space achieves a 4 star NABERS energy and water rating by 2020.

Renewable energy at least cost

The NSW Government will focus on the best value-for-money solutions to deliver our renewable energy commitments and support achievement of the national target. The cost of renewable energy varies considerably among technologies and over time.

Since 2001, the Commonwealth Government has mandated the use of energy from renewable resources in electricity generation. The current Renewable Energy Target (RET) scheme mandated by the Commonwealth Government is for 20% of Australia's electricity supply to come from renewable sources by 2020. Deployment of low-cost options to meet the RET will help to mitigate future increases in electricity bills.

Figure 1 – Comparative costs of renewable technologies in NSW (utility-scale 2012)



Source: Bureau of Resources and Energy Economics, 2012

Note: The bars indicate the levelised cost by technology for a new-build utility-scale plant. A$/MWh are presented in 2012 values and include the carbon price.

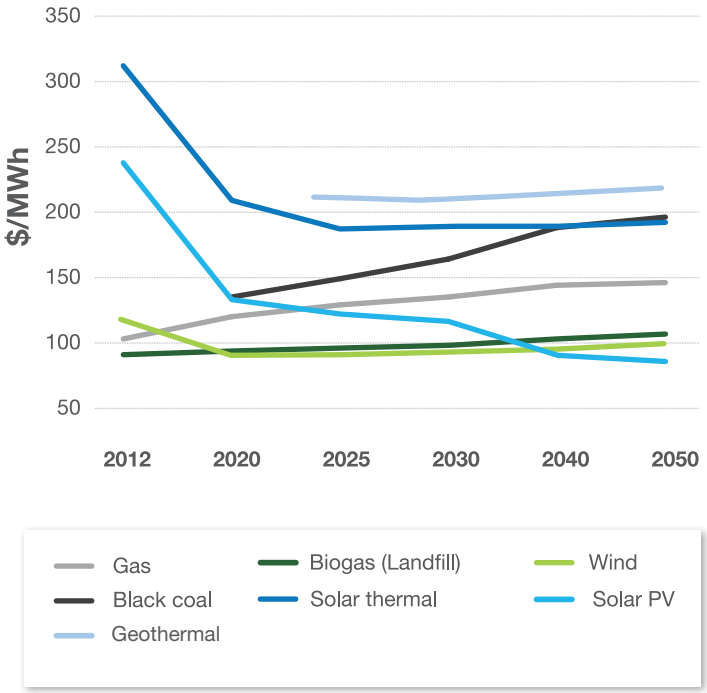
Note: Costs are for specific types of renewable technologies: Solar PV (non-tracking); Solar thermal (central receiver with storage).

Note: These figures are utility scale and figures change over time. These figures are from one source and provide an indication of relevant costs at the time they were prepared.

#The costs for solar reflect utility scale and exclude residential roof scale solar PV.

The Commonwealth has established a $10 billion commercially orientated Clean Energy Finance Corporation to support green energy projects. The NSW Government is committed to ensuring that NSW is positioned to attract a major share of this renewable investment.

Figure 2 – Predicted change in costs of electricity from different sources over time in NSW (utility scale 2012-2050)



Source: Bureau of Resources and Energy Economics, 2012

Note: The lines indicate the predicted change over time in levelised cost by technology for a new-build utility-scale plant. Costs are predicted from 2012 to 2050 based on assumptions of input costs and other factors such as rates of learning and technology efficiency. The cost of the projected carbon price is included.

Note: Costs are for specific types of technologies: Gas (combined cycle); Black coal (supercritical pulverised); Geothermal (hot rock); Solar PV (non-tracking); Solar thermal (central receiver with storage).

Note: Costs are provided for black coal and geothermal when they are considered to be commercially deployable.

Note: These figures are utility scale and figures change over time. These figures are from one source and provide an indication of relevant costs at the time they were prepared.

Opportunities for renewable energy in NSW

NSW is open for business in renewable energy

NSW has excellent renewable energy resources and the NSW Government will work to attract renewable energy investment and jobs to NSW.

There will be significant investment in renewable energy in the decade to 2020 – estimated by Bloomberg at $36 billion across Australia. Bloomberg's model shows that by 2018, solar technologies will begin to gain market share from wind energy as the cost of solar systems is greatly reduced. The forecast result is $18 billion invested in wind energy projects, $16 billion in both large and small-scale solar PV and $400 million in solar thermal technologies across Australia (Bloomberg New Energy Finance, 2011).

Individual private sector investors will base their locational decisions not only on the energy resource and grid connection fundamentals in each state, but also on how open each jurisdiction is for business. The NSW Government will seek to attract a large proportion of this investment in renewable energy to NSW.

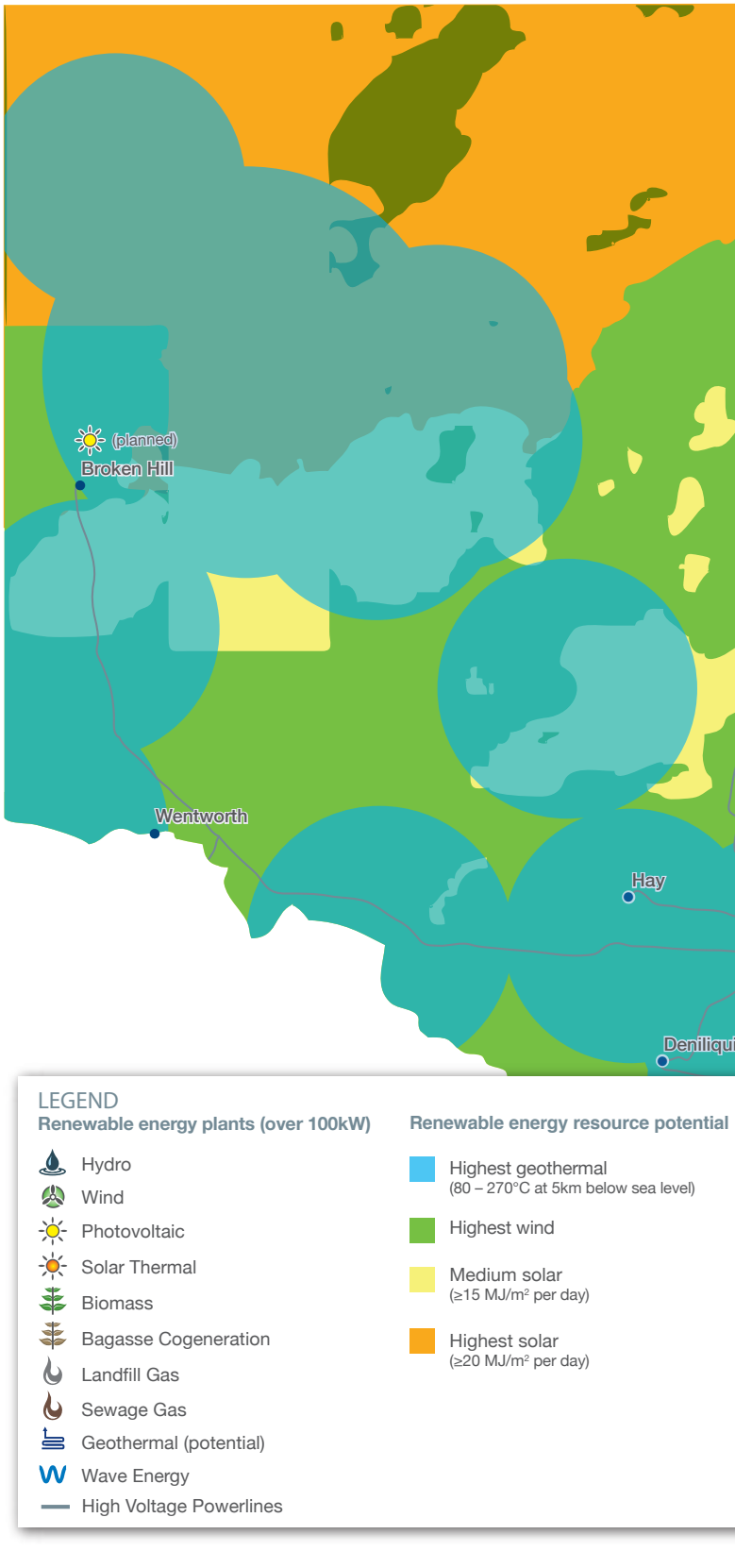
New renewable energy jobs

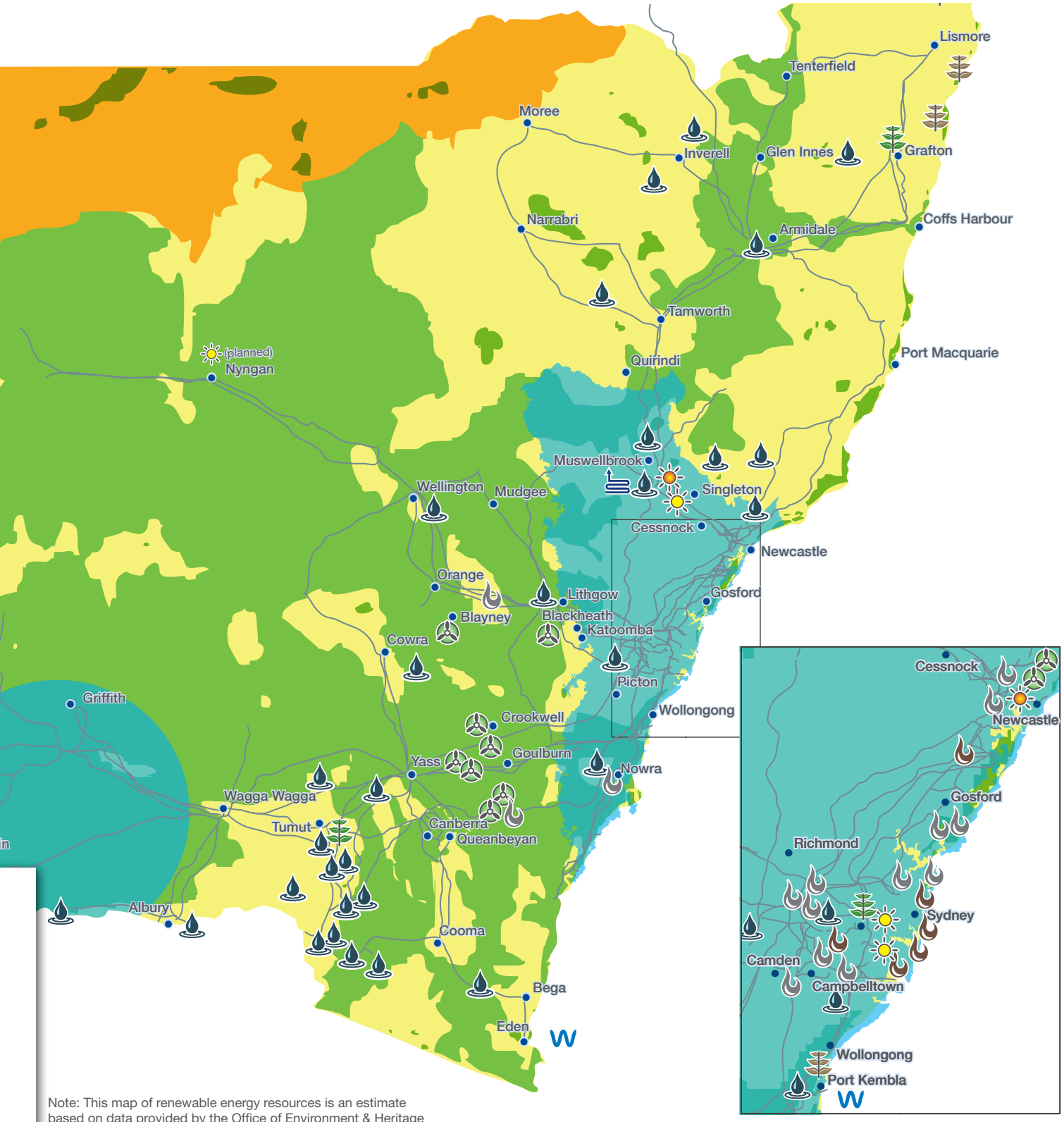
Many submissions referenced the importance of renewable energy in job creation. Abengoa noted that deployment of renewable energy should lead to the creation of new support businesses and training opportunities as NSW moves to a future underpinned by renewable energy.

It is estimated that 6,000 new jobs will be created in regional NSW over 20 years through construction, installation, manufacture and operation of renewable energy technologies. The majority will be in the NSW/ACT border region, the Central Tablelands, the Snowy Monaro region, the South Coast and the New England Tablelands (The Climate Institute, 2011).

Jobs will also be created in renewable energy R&D hubs. For example, the new $40 million Newcastle Institute for Energy and Resources at the University of Newcastle will have capacity for 274 research staff by June 2013. In addition, the Clean Energy Finance Corporation in Sydney will create 40 new jobs. NSW continues to attract international renewable energy companies to locate their Australasian headquarters in Sydney.

Figure 3 – NSW Renewable Energy Plants (over 100kW) and Renewable Energy sources





Note: This map of renewable energy resources is an estimate based on data provided by the Office of Environment & Heritage and Department of Primary Industries, NSW Government; and Hot Dry Rocks Pty Ltd.

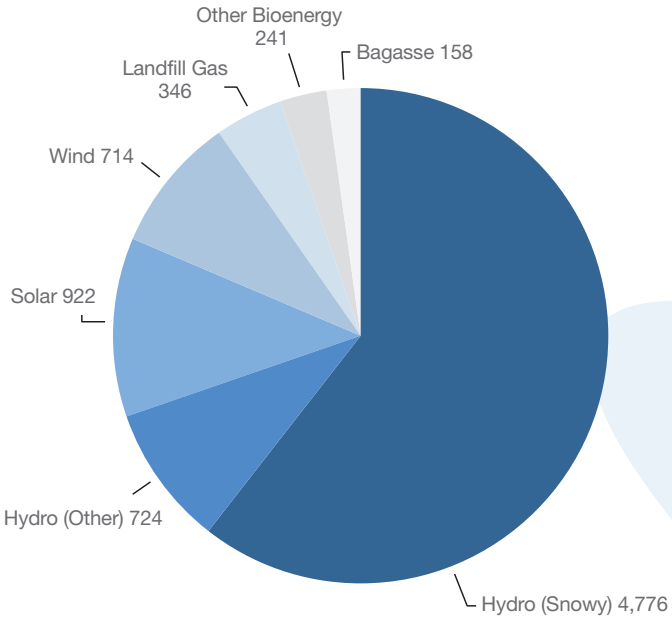
Note: This map of renewable energy plants is based on data provided by the Clean Energy Council, current July 2011.

NSW has a growing mix of renewable energy.

In 2012 approximately 7,881 GWh of electricity generated in NSW was from renewable energy sources.

In 2011, renewable energy generation in NSW was approximately 5,840 GWh. The variation is a result of generation levels of hydroelectricity from the Snowy Mountains hydroelectricity scheme, which comprises the largest portion of renewable energy generation. Renewable energy from other sources (small-scale hydro, solar, bioenergy and wind) increased by 43% between 2010 and 2011 and a further 8% between 2011 and 2012.

Figure 4 – NSW renewable energy generation in 2012 (GWh)



Source: NSW Trade & Investment, NSW Government
Note: Other Bioenergy includes municipal solid waste, black liquor, food waste, sewage gas, waste from processing of agricultural products and wood waste. Renewable Energy Generation excludes Solar Hot Water Heaters and wood use (non-waste).

Based on the renewable energy projects that are under construction or have been approved through the planning system, NSW could increase generation from renewable sources to 13,000 GWh.

Broad deployment of renewable energy technologies

Bioenergy

Bioenergy resources include generating technologies using biomass sources such as bagasse (sugar cane residues), wood waste and biogas from landfill and sewerage facilities, and biofuels such as ethanol and biodiesel.

In 2012, NSW generated approximately 745 GWh of bioenergy. We are leaders in the use of landfill gas and have significant further potential bioenergy resources including agriculture, forestry and waste resources. NSW also has the capacity to produce up to 300ML of ethanol and 20ML of biodiesel per year. This could be expanded.

NSW is examining ways we can streamline processes and remove barriers to enable use of wood wastes from appropriate sources to provide fuel for existing power stations. NSW is also considering the use of invasive native scrub as a source of bioenergy production.

There are a number of plants currently producing biofuels in NSW. At Bomaderry, near Nowra on the south coast of NSW, the Manildra Group operates the largest of the three distilleries in Australia manufacturing ethanol, primarily for use as a transportation fuel. At Rutherford, near Maitland in the Hunter Valley, Biodiesel Industries Australia produces biodiesel, mainly from used cooking oil and tallow feedstocks. National Biofuels Group at Port Kembla is developing a new plant to produce biodiesel from soybeans.

Several pre-commercial advanced biofuels facilities are also operating. At Somersby, on the NSW Central Coast, a demonstration plant operated by Licella, converts woody materials and other bio-mass into liquid bio-crude oil that has refining potential for use as petrol, diesel and aviation fuel. At Bomaderry, Algaetec has commenced production of algae biomass on an industrial scale from its showcase biofuels facility. At Harwood sugar mill, near Maclean on the far north coast, Ethtec operates a pilot plant for the production of ethanol from cellulosic feedstocks such as bagasse and forestry residues.

The NSW Government is also supporting the biofuels industry with a mandate requiring primary wholesalers and major retailers to average 6% ethanol in all petrol and 2% biodiesel in all diesel fuel sold.

NSW has world-class biofuel R&D capabilities, including the work done at Macquarie University, the University of NSW and the University of Sydney into novel biofuel production technologies. The University of Technology Sydney and the University of New England are also supporting research into the development of second and third generation biofuels.

Geothermal

NSW has potential for enhanced geothermal systems resources ('hot dry rocks') close to customers, generators and networks, with an estimated 55 gigawatts (GW) of potential electricity generation if 20% of the total estimated heat energy is extracted. According to industry research, NSW may have the potential to generate up to 46 times more energy from geothermal resources than currently generated using fossil fuels.

NSW is supporting resource mapping of geothermal energy potential, and has funded research into rock thermal properties to map the geothermal landscape in the Sydney Basin. It has also commissioned a scoping study to identify a resource base, possible markets and current impediments to local small-scale geothermal power generation projects. A collaborative research project by the University of Newcastle, Xstrata and NSW Trade & Investment is also examining the potential for geothermal energy to reduce emissions from coal-fired power stations.

The NSW Government is also facilitating resource discovery by extending the mineral exploration licensing regime to include geothermal resources. Licences have been granted to explore for geothermal energy in the Sydney and Gunnedah Basins.

Hybrids

Hybrid systems are a cost-effective way to extend the life of existing infrastructure and create a reliable energy supply from a variable renewable energy source.

The NSW Government, through its Climate Change Fund, has invested nearly $10 million in a medium-scale solar thermal energy booster for the Liddell coal-fired power station in the Hunter Valley. This is a world first in integrating solar thermal technology and a coal-fired power station. This investment has doubled the size of the existing solar array to 9.3 megawatts thermal (MWth), which makes the Liddell power station the largest solar thermal energy project in the Southern Hemisphere. The energy generated is being used to heat feedwater for the power station and will supply renewable energy for more than 1,000 homes annually.

Hybridisation of concentrated solar thermal with carbon capture and storage systems will be demonstrated at a CSIRO-operated pilot plant at DELTA Electricity's power station near Lake Macquarie. Hybrids can also involve the use of bioenergy in existing thermal power stations or in combination with diesel or gas generators in off-grid locations. Hybridisation of renewables with gas-fired generation can also address the problem of intermittent supply from renewables such as solar or wind.

The NSW Government understands the economic opportunities available from hybrids and will examine proposals that maximise the use of renewable resources through integrated energy technologies.

Hydro

NSW has long been a leader in hydroelectric generation.

While the technology is mature, there are future opportunities to install small-scale facilities on dams, weirs, water and sewage treatment plants, flow control structures and water supply pipelines, and to augment existing hydro plants. There is an estimated total of more than 1,000 megawatts (MW) in potential generation at several dozen sites in NSW. A recent example is the new 3.7 MW hydroelectricity plant at Prospect Reservoir in Western Sydney. The NSW Government is researching improvements so future small hydropower projects on dams and weirs are fish-friendly and support the needs of local and downstream water users.

NSW has excellent hydropower R&D capacity at facilities such as the University of NSW's Water Research Laboratory. There is strong potential to export our knowledge to assist the development of very large hydropower resources in nearby nations in southeast Asia and Australasia.

Solar

NSW has a range of competitive advantages as a location for solar power investment, including excellent solar resources and world-class solar research institutions.

In 2012, NSW generated 922 GWh of solar energy from 519 MW of installed capacity. The Australian Energy Market Operator has forecast that within NSW and the ACT 2,260 GWh of solar energy will be generated from 1.87 GW installed rooftop PV capacity in 2020 and 5,560 GWh from 4.45 GW installed capacity in 2031 (Australian Energy Market Operator, 2012).

The NSW Government is working with the Commonwealth Government to facilitate construction of one of the largest solar photovoltaic projects in the world in NSW. The $450 million 155 MW project, to be developed by AGL and First Solar, will produce enough electricity to power around 50,000 homes. The project will be built over two NSW sites and will create up to 150 direct jobs at Broken Hill and up to 300 at Nyngan.

Under the Education Investment Fund component of the Solar Flagships project, The University of New South Wales has been granted $19 million to conduct related research.

NSW is at the forefront of solar R&D. The CSIRO Solar Tower in Newcastle is the largest solar thermal research facility in Australia with a capacity of 200 kilowatts (kW). In addition, the NSW Government has invested in pioneering Australia's first solar thermal cooling technology in a high-demand retail environment. Led by GPT Group and supported by CSIRO, Bovis Lend Lease and New Energy Partners designed and installed a solar thermal cooling plant to air-condition the Charleston Square shopping centre near Newcastle.

Wave and tidal

NSW has superior wave and ocean resources with a long coastline exposed to good ocean swells. The NSW coast also possesses a range of tidal energy resources at ocean, lagoon and river mouths.

These technologies are highly developmental, both in Australia and internationally. NSW supports research efforts such as wave and ocean trials, including Oceanlinx's 500 kW wave demonstration plant at Port Kembla. This trial was Australia's longest-running wave energy program, supplying power to the grid in 2010 on a scale unprecedented in Australia. NSW's support for this trial assisted further commercial development of oscillating water columns technology, with future opportunities now being explored.

The NSW Government will encourage further R&D in wave and tidal technologies in NSW.

Wind

Large areas within NSW have excellent wind resources by international standards and many of the best sites are located near existing electricity grid infrastructure. In 2012 wind power contributed 714 GWh to NSW electricity generation.

There is strong interest in the development of wind energy projects in NSW with wind energy projected to remain the most economical form of large-scale renewable energy over the next decade. As of April 2013, NSW has more than 2.3 GW of new wind generation proposals with development consent and an additional 5.9 GW under assessment through the planning system. Based on wind projects with development consent or in the planning assessment phase there is a potential to add up to 8.2 GW of additional wind capacity generating up to $21 billion in capital investment with associated employment and regional development benefits.

Leading on renewable energy enablers

Smart grids

Through programs like Ausgrid's Smart Grid, Smart City – Australia's first commercial-scale smart grid, NSW is set to deliver a more stable and reliable energy supply for consumers while integrating renewable energy and embedded generation technologies.

Smart Grid, Smart City is testing new energy supply and communication technologies, including smart meters and associated In Home Displays or Home Area Networks, gas fuel cells, battery storage and electric vehicles. Up to 50,000 households and businesses have been invited to participate across five sites in Newcastle, Sydney and the Upper Hunter.

Leading the way in technologies like smart grids means that NSW energy consumers will benefit from increases to both the amount of information available to them and the level of control they have over their energy use. This will help improve demand management and ultimately the efficient utilisation of plant and capital costs, including renewable energy.

Storage

Energy storage can increase the value of renewable energy to individuals, network operators and investors. Storage allows renewable energy investors to increase revenue by selling power at times of peak market prices as opposed to when the electricity is generated. This in turn places downward pressure on electricity prices by encouraging more supply at times of peak demand and reducing the need for additional distribution and transmission infrastructure.

As part of the Smart Grid, Smart City project, 60 households in the Newcastle and Scone regions of NSW are trialing new zinc-bromine battery modules (from ASX listed company RedFlow) to create 'micro-grids' in those areas. The storage will supply extra electricity during peak periods and better shield the households from outages.

Storage technology (including rechargeable batteries and thermal energy storage) is a global market, with many other countries currently grappling with ways to integrate increasing amounts of renewable energy into their networks. NSW can leverage the work being done overseas as well as develop storage expertise within NSW to create a long term export industry.

Goal 1
Attract renewable energy investment

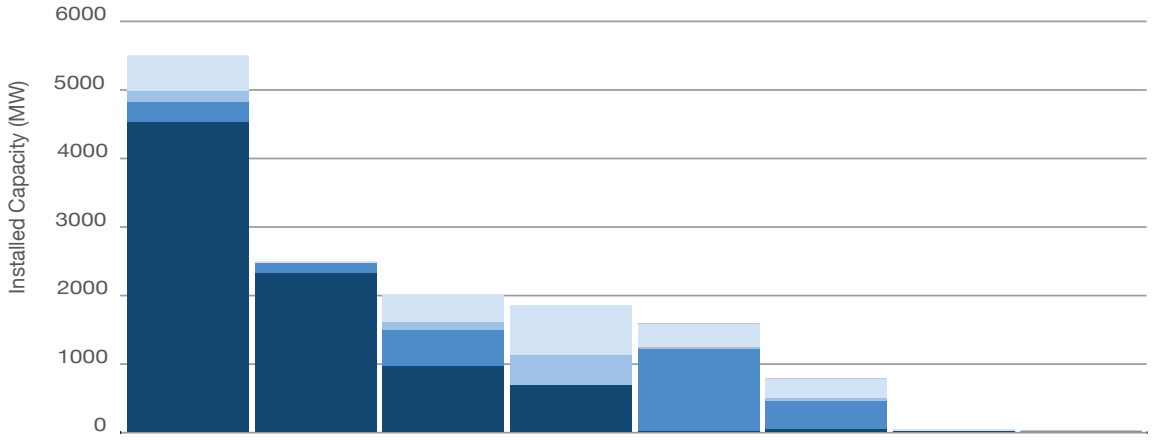
With the largest installed renewable energy capacity in Australia, and with abundant renewable energy resources, NSW is well positioned to attract future renewable energy development. Our leading R&D facilities are paving the way for technology performance improvements and our commitment to expanding generating capacity is helping reduce capital costs.

Developing NSW's renewable resources requires a favourable investment environment and regulatory and policy predictability.

The NSW Government is focused on practical steps to remove barriers to investment in renewable energy including:

- improving network connections
- streamlining the planning process
- creating a supportive regulatory environment
- promoting investment opportunities in NSW
- maintaining a fair price for solar and a sustainable solar industry.

Figure 5 – Installed capacity of renewable energy by state and territory (2012)



Fuel source	NSW	TAS	VIC	QLD	SA	WA	ACT	NT
Hydro	4522	2310	958	674	4.4	30	1.3	0
Wind	282	142	519	12	1205	423	0	0
Bioenergy	167	5.1	116	430	20.5	33	4.4	1.1
Solar PV[3]	501	28	408	721	341	283	28	9.7
Solar thermal	12.3	0	0	0	0	0	0	0
Geothermal	0	0	0	0.1	0	0	0	0
Marine	0	0	0.2	0	0	0	0	0
Total MW	5485	2485	2001	1837	1571	769	34	11

Source: Clean Energy Australia Report 2012, Clean Energy Council
Note: Although 3740 MW of Snowy Hydro capacity is located in the state of NSW, some of its capacity is classified as being part of the Victorian region of the National Electricity Market.

Improve network connections

The NSW Government will assist in streamlining negotiations between network service providers and investors so that timeframes for grid connections in NSW are competitive and unreasonable delays are avoided.

Many submissions received through public consideration of the draft Renewable Energy Action Plan agreed with the need to improve network connection processes. Infigen Energy noted that facilitating grid connections is "a very innovative and important step towards attracting investment in renewable energy".

A dedicated Renewable Energy Advocate will be appointed to act as a single point of contact for industry to assist with network connections and industry attraction. In the early stages of projects, they will assist in providing access to resource mapping data to give proponents better information on the most viable locations for renewable energy development. The Renewable Energy Advocate will also assist proponents connect to the grid, by resolving individual network connection problems.

NSW network and national energy market regulatory requirements can be complex. Distributed generation projects are often large enough to have grid connection impacts but small enough that connection costs can significantly alter the viability of a project. The Renewable Energy Advocate will assist with distributed generation connection issues.

As part of the role, the Renewable Energy Advocate will work with network operators and will have responsibility for identifying systemic impediments to grid connection. This will build an evidence base to address issues that can be used to inform the ongoing development of the National Connections Framework.

Action 1

Improve the process of network connection by:

- facilitating timely network connections
- assisting to resolve issues when they arise
- improving access to resource mapping in NSW so energy resources are linked spatially to demand and network capabilities, enabling easy identification of opportunities and constraints
- developing and publishing clear guidance outlining the steps for grid connection for commercial-scale PV, providing greater certainty of process and timeframes and identifying opportunities for cutting red tape and costs.

Responsibility: NSW Trade & Investment – Division of Resources and Energy working with Renewable Energy Advocate

Streamlining the planning process

The NSW Government is reviewing the planning system in NSW and proposing a shift to a more strategic and streamlined system that facilitates economic growth. Stakeholder submissions to the review have raised issues about the planning process for renewable energy developments. These matters will be addressed as part of the planning review.

The new planning legislation is founded on the principle of sustainable development that meets the needs of the current generation without compromising the ability of future generations to meet their needs. Renewable energy projects are a good example of sustainable development in action. The new planning system will focus public participation on strategic planning in order to provide greater certainty for applications and the community in development assessment. Under the new system, the Planning Assessment Commission will retain responsibility for determining many large-scale renewable energy proposals.

Action 2

Consider a more strategic and integrated approach to assessment of renewable energy projects as a component of the review of the NSW planning system.

Responsibility: NSW Planning & Infrastructure

Create a supportive policy and regulatory environment

To encourage investment, clear policies regarding access to renewable resources are required. The NSW Government will remove identified unnecessary regulatory barriers to renewable energy development.

This will include finalising an energy-from-waste management policy, with a focus on providing clarity on energy production from waste streams as well as reviewing the opportunity for using bioenergy for co-firing purposes. Use of native vegetation will be consistent with regulations.

NSW will take an active role in developing and shaping national energy rules and policies, balancing the need for regulatory stability with reduced red tape and improved performance.

Action 3

Remove technology specific barriers to create a supportive policy and regulatory environment for investment including:

- finalise energy-from-waste management policy with a focus on providing clarity on energy production from waste streams
- review the opportunity for using bioenergy for co-firing purposes.

Responsibility: Environment Protection Authority

Promote investment opportunities in NSW

The national 20% renewable energy target is the current driver for renewable energy investment in Australia.

The NSW Government is committed to ensuring that NSW is positioned to attract a major share of this renewable investment. We will attract investment in NSW by identifying our renewable resource, informing our investors and promoting investment opportunities.

Action 4

Create an online information portal that provides information to investors including:

- details of NSW and Commonwealth Government renewable energy technology and financing assistance programs
- details of the NSW planning processes and community consultation requirements (including current "active" projects)
- details of current investors, financiers, advisors, industry associations, contractors and equipment providers in the Australian renewable energy market
- links to relevant NSW and Commonwealth Government policies
- compiled resource mapping in NSW
- grid and network demand information, including spatial information about grid hotspots
- learning and experience gained through previous NSW projects, in the form of case studies of NSW projects, links to other useful websites and online discussion forums
- links to resources available from the NSW Renewable Energy Precinct program.

Responsibility: NSW Trade & Investment – Renewable Energy Advocate working with Investment and Export Services Team

Submissions to the draft Renewable Energy Action Plan supported the appointment of the Renewable Energy Advocate. The new Renewable Energy Advocate within the NSW Trade & Investment's Division of Resources and Energy will work with the existing Investment & Export Services Team to make investing in renewable energy in NSW more attractive.

The experience of the Renewable Energy Facilitator for the Canadian Province of Ontario has demonstrated the benefits of establishing a dedicated resource within government in attracting effective and targeted investment in renewable energy.

The Renewable Energy Advocate will also work with the banking and investment community to capitalise on Sydney's role as a major financial centre for facilitating investment in renewable energy projects. The Renewable Energy Advocate will work with industry bodies, domestic and international Innovation Councils, research bodies and NSW international offices and allies to identify opportunities created by overseas developments.

Action 5

Promote and facilitate investment opportunities through the appointment of a Renewable Energy Advocate within NSW Trade & Investment. The Advocate will work with the existing Investment & Export Services Team to:

- attract, facilitate and expand renewable energy investment in NSW
- resolve barriers to investment across Government, and work with the Department of Planning & Infrastructure on project facilitation
- identify Crown land that can be used for potential renewable energy production based on the suitability of the sites for renewable energy projects
- leverage specific Commonwealth programs
- work with the banking and investment community to capitalise on Sydney's role as a major financial centre for facilitating investment in renewable energy projects
- work with industry bodies and NSW international offices and allies to identify opportunities created by overseas developments
- work with relevant domestic and international Innovation Councils and research bodies to advance the sector
- assist the Renewable Energy Precincts Program to engage with communities early and effectively about the renewable energy industry.

Responsibility: NSW Trade & Investment – Renewable Energy Advocate working with Investment and Export Services Team

Maintain a fair price for solar and provide a sustainable future for the solar industry

The NSW Government seeks to provide a sustainable and predictable future for the solar industry and to avoid the unsustainable boom and bust cycle created by the Solar Bonus Scheme.

The NSW Government requested the Independent Pricing and Regulatory Tribunal (IPART) undertake a review to determine a fair price for small-scale generated solar energy which will:

- result in no increase in electricity prices
- result in no additional funding from the NSW Budget
- be administratively simple and take into account any impacts on retailer operations
- support a competitive electricity market in NSW.

The IPART review was finalised in March 2012. The Government accepted IPART's advice and requested that IPART set a voluntary benchmark range for small-scale generated solar. The benchmark range reflects the value of generated electricity and should therefore not result in a cost being passed on to consumers. On 28 June 2013, IPART published its determination for a benchmark range to apply for 2013/14. IPART determined this range to be 6.6–11.2 cents per kilowatt hour (c/kWh) for electricity exported to the grid from small-scale photovoltaic customers.

Action 6

Request IPART to estimate a benchmark range for a fair price for small-scale generated solar energy.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Submissions relating to rooftop PV, including BlueScope Steel, the Central Coast Community Energy Association and the City of Sydney, recognise an ongoing consumer and business interest in this area.

The Solar PV industry is developing a code of conduct for retailers to improve the interaction and expectations from customers.

There continues to be significant demand for small-scale solar PV, with more than 81,000 customers connecting small generators since the closure of the Solar Bonus Scheme (data as at 14 June 2013).

However, it is clear from the number of submissions from individuals and environmental groups to the draft Renewable Energy Action Plan seeking a new bonus feed-in tariff scheme, that information barriers remain about the rights and benefits of investing in small-scale systems in NSW. There are attractive options for the continued deployment of small-scale solar PV, solar hot water and wind turbines in NSW.

One component of the way forward for small-scale generation is to overcome these barriers by clarifying and informing consumers about their rights and the offers available in NSW.

Action 7

Develop a regularly updated information package for small-scale solar PV, solar hot water and wind generation through the newly created online information portal. This will include information on customer rights, business cases for investment and connection procedures.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Mid-scale solar PV will become increasingly attractive as prices for installation on rural allotments, large industrial, commercial, government or community rooftops become comparable with the delivered cost of peak power. For example, Infigen Energy has begun construction of the Capital East Solar Farm, a 1 MW solar PV facility near Bungendore.

To support mid-scale solar, the NSW Government will work with industry to:

- identify commercial sites where mid-scale solar PV would be beneficial
- facilitate the uptake of mid-scale solar PV for commercial buildings.

Action 8

Support mid-scale solar PV by identifying opportunities and working with electricity distributors to enable uptake of solar technologies where they are most cost effective. This will involve:

- facilitating grid connection through the dedicated Renewable Energy Advocate
- identifying opportunities and facilitating the uptake of distributed energy technologies where they are most cost effective (including large industrial, commercial, government and community sites)
- holding a seminar on Environmental Upgrade Agreements legislation and how it can be applied to renewable energy deployment
- identifying priority commercial areas and industries for commercial-scale PV, based on existing network constraints and sectors with high electricity costs during the day
- working with the Renewable Energy Precincts Program to identify and support opportunities for the use of mid-scale solar PV by local Councils and regional communities.

Responsibility: NSW Trade & Investment – Division of Resources and Energy working with Renewable Energy Advocate

To support large-scale solar in NSW, the NSW Government will contribute $64.9 million in funding for the development of the solar PV project built in Broken Hill and Nyngan. The $450 million 155 MW project, built under the Commonwealth Solar Flagships Program and to be developed by AGL and First Solar, will produce enough electricity to power around 50,000 homes and deliver up to 150 jobs in Broken Hill and up to 300 jobs in Nyngan.

Action 9

Work with the Commonwealth Government to facilitate construction of the Solar Flagships project in Broken Hill and Nyngan, with $64.9 million in funding from the NSW Government.

Responsibility: Office of Environment & Heritage

Goal 2
Build community support

The NSW Government will give the community a say on decisions that affect them.

We will build community support for renewable energy by:

- implementing the new NSW planning guidelines for wind energy projects
- engaging with the community early and effectively on renewable projects
- facilitating community partnerships and ownership of renewable energy projects
- arming consumers with better information
- supporting renewable energy technologies through the creation of the Renewable Energy Advocate.

New planning guidelines for wind energy projects

Community and industry have provided strong feedback in relation to the draft NSW wind farm planning guidelines through an extensive consultation process and through submissions to the draft Renewable Energy Action Plan. This feedback has been taken into account to develop guidelines that give greater certainty, consistency and clarity to industry and provide communities with greater confidence that issues are being appropriately addressed.

The NSW Department of Planning & Infrastructure is working hard to finalise the guidelines, which aim to balance the concerns of local residents where wind energy projects are proposed, with industry and community interest in the development of projects and the overall objective of attracting efficient renewable energy investment to NSW.

Action 10

Implement NSW wind energy planning guidelines.

- the planning guidelines will be communicated to local communities in partnership with the Renewable Energy Precincts Program.

Responsibility: Department of Planning & Infrastructure

Australian Wind Industry Community Engagement Guidelines

The Clean Energy Council on behalf of the Australian wind industry has released its community engagement guidelines. The guidelines demonstrate the industry's commitment to involving local communities in the development and management of wind farms. The guidelines were developed by independent consultants and will be continuously reviewed and updated to reflect best practice in community engagement.

Engage communities early and effectively in renewable energy projects

The NSW Government wants local communities to be informed participants in discussing proposals for local and community renewable energy projects.

Since the publication of the draft plan, the Renewable Energy Precincts program has recently been reviewed. As a result of the findings, we will improve and extend the program to expand the role of the regional co-ordinators to better support the community in their engagement in renewable energy projects.

The precinct areas were initially defined based on areas where significant wind resources existed and developments were likely to occur. The new approach will enable regional co-ordinators to engage more broadly across a variety of renewable technologies and across a broader area of NSW.

The Central Coast Community Energy Association's submission to the draft Plan supported the review of the existing Renewable Energy Precinct program and proposed that precincts be expanded to include other strategic locations in NSW.

Action 11

Expand the role of the regional co-ordinators so they support the community in their early and effective engagement with renewable energy projects across a greater area of NSW. The improved program, to be renamed the Regional Clean Energy Program, will include:

- extending the coverage of precincts to new areas such as Broken Hill and the north coast
- supporting community engagement in renewable energy projects – large and small-scale projects across a variety of renewable technologies, including wind, solar, geothermal and bioenergy
- providing regional support for the Renewable Energy Advocate
- providing data and information for all stakeholders to encourage best practice in all aspects of renewable energy development
- providing information about NSW and Commonwealth energy efficiency initiatives.

Responsibility: Office of Environment & Heritage

Support community-owned renewable energy projects

Community-owned renewable energy projects provide a number of benefits such as returning profits to the community and building local skills.

Community wind farms are common in parts of Europe (Denmark, Germany and Spain) and the United States, and there is a track record of successful community-owned infrastructure projects in sectors in NSW (e.g. dairy farmers, irrigation).

The NSW Government, through the local renewable energy co-ordinators, will support community-owned renewable energy projects. For example, in the New England region, there has been strong community interest in establishing a community wind energy project. The community wants to advance energy self-sufficiency in the region, as well as deliver clean energy and a financial return for the community.

The NSW Government partnered with three local community organisations to fund a study into the feasibility of a community-owned wind energy project. The final report reflected the views of more than 1,300 people and organisations directly involved in the study and covered governance issues, location of the turbines, operational management and scale.

The feasibility study recommended an eight-turbine wind energy project which would produce sufficient electricity for 25,000 people and 9,000 dwellings – close to half the area's residential load.

The NSW Government recently made funding available through the Renewable Energy Precinct Program for locally-owned renewable energy projects. This short-term funding is assisting in early stage pre-feasibility and assessment activities for nine projects across NSW.

To help communities in other areas also wanting to develop locally owned renewable energy, the NSW Government will build on the experience from these pre-feasibility studies to develop tools and standard contracts with project facilitation support from regional coordinators.

Action 12

Facilitate community ownership of renewable energy projects by providing tools, standard contracts and project facilitation support.

Responsibility: Office of Environment & Heritage

Provide information to consumers

GreenPower is a joint initiative of the ACT, NSW, SA, QLD and VIC Governments. The program enables energy providers to purchase renewable energy on behalf of consumers who have agreed to a percentage of their energy consumption being delivered from a renewable energy source. In 2011, a total of 533,581 megawatt hours (MWh) of GreenPower was purchased in NSW by residential and commercial consumers. The program aims to facilitate the installation of new renewable energy generators across Australia beyond mandatory renewable energy requirements.

Action 13

Promote the benefits to consumers of switching to GreenPower accredited renewable energy.

Responsibility: NSW Trade & Investment – Division of Resources and Energy working with Office of Environment & Heritage

The electricity sector has been moving towards advanced metering infrastructure and systems, generally classified as Smart Meters. The NSW Government will develop a consistent approach to Smart Meter technology across the NSW distribution businesses.

Action 14

Develop a draft NSW Smart Meter Policy that:

- ensures the best cost outcomes for consumers
- improves the availability of information to customers about their electricity consumption so they can make informed choices about their use of electricity
- ensures net benefits for NSW homes and businesses, while delivering reliable electricity supply.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Goal 3
Attract and grow renewable energy expertise

NSW will attract and grow expertise in renewable energy technologies by:

- encouraging concentration of renewable energy expertise in appropriate locations
- continuing to lead on research and innovation
- facilitating partnerships between industry, government and research organisations to encourage growth and productivity in renewable energy
- encouraging concentration of industry and clustering to improve engagement between firms, development of shared facilities and services and concentration of expertise.

The Commonwealth Government also provides significant funding for research, development and deployment, either through R&D tax credits or direct funding. Moving forward, this will be significantly streamlined through the Australian Renewable Energy Agency and the Clean Energy Finance Corporation in Sydney.

Australian Renewable Energy Agency – a $3.2 billion agency consolidating support for renewable energy technology development. It includes Solar Flagships Program; Renewable Energy Demonstration Program; ACRE Solar Projects; Geothermal Drilling Program projects; Emerging Renewables Program; Renewable Energy Venture Capital Fund; and the Australian Solar Institute.

Clean Energy Finance Corporation – a $10 billion commercially oriented agency, which will fund low emissions technologies through commercial investments of loans, loan guarantees and equity investments, and leveraging of private sector investment. Investments will focus on renewable energy, energy efficiency and low emissions technologies, and the transformation of existing manufacturing businesses to re-focus on meeting demand for inputs for these sectors. The Corporation is located in the Sydney CBD to capitalise on its network of financial, legal and professional services. The Corporation will also take advantage of R&D hubs in NSW.

Most renewable energy technologies are still more costly than traditional fossil fuel-based technologies and will take some years to become viable even under a carbon price. However the rate of cost reduction in recent years has been significant. Ongoing cost reductions will come from both global developments in the design, conversion efficiency and manufacture of the technologies.

In order to get more renewable energy technologies and infrastructure incorporated into our energy system we require mature renewable energy technologies. Some mature technologies will be developed elsewhere around the globe and therefore NSW must monitor developments and be a smart adaptor of technologies to our particular renewable energy sources.

We also have global R&D leaders working in NSW, such as Professor Martin Green at The University of New South Wales, who has led the development of solar photovoltaic technology for 30 years. We will continue to encourage excellent R&D, making the State an attractive place to invest, and putting NSW on the renewable energy world map. This will place NSW in a strong position to build high-quality renewable energy installations.

Ultimately we will see significant deployment of renewable energy-only sources. However, some renewable energy technologies are still relatively immature, and will require further R&D before they can attract significant capital investment. In the meantime, NSW can be clever at finding pathways that include fossil/renewable hybrids, allowing the extension of the life of existing coal-fired power stations while reducing their emissions. An example of this has already occurred with the Liddell coal-fired power station in the Hunter Valley, the first of its kind in Australia to incorporate solar thermal technology as a booster technology.

Create renewable energy hubs

The NSW Government will partner with industry and explore potential hubs where the geographic location of renewable energy resources may create opportunities.

NSW will be a leader in the region in energy technology and services. It will leverage its centres of expertise such as the CSIRO Energy Centre in Newcastle; Smart Grid Smart City initiative; the University of NSW's School of Photovoltaic and Renewable Energy Engineering; and the Collaborative Research Centre for Low Carbon Living.

Skills and knowledge generated in these centres contribute to NSW's competitive advantage for securing a share of global energy efficiency markets. Consistent with recommendations in the NSW Professional Services Industry Action Plan, the Government will support collaborations between industry and the research sector, capture opportunities in the Asian region and position NSW as a leading centre for energy technology and services.

Action 15

Investigate opportunities to support experience centres/demonstration projects to provide:

- commercial-scale demonstration of renewable energy technologies
- demonstration of best practice in residential renewable energy.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Action 16

Conduct renewable energy research roundtables to promote and showcase research, development and investment in renewable energy technologies.

Responsibility: Office of the NSW Chief Scientist & Engineer

Lead on research and innovation

The NSW Government will promote NSW's standing as a world leader in renewable energy education, research and innovation.

The Government will bring together leaders in the renewable energy research sector to share ideas and promote advancements across a range of technologies. We will recognise and honour the achievements of renewable energy researchers from NSW or in NSW research facilities.

In addition, NSW will work with the Commonwealth Government to shape initiatives such as the Australian Renewable Energy Agency and the Clean Energy Finance Corporation to maximise innovation and research opportunities.

Action 17

Promote NSW as a leader on research and innovation in renewable energy by:

- building links between academic and industrial research goals using funding systems such as Australian Research Council Linkage grants
- focusing on attracting support to help technologies move from R&D to demonstration, or demonstration to pilot (e.g. wave technology)
- identifying opportunities to provide undergraduate engineering and postgraduate research scholarships (e.g. modelled on the existing Ausgrid scholarships).

Responsibility: NSW Trade & Investment – Renewable Energy Advocate working with Office of the NSW Chief Scientist & Engineer

Action 18

Continue the recently created NSW Renewable Energy Innovation Prize as part of the NSW Science and Engineering Awards.

Responsibility: Office of the NSW Chief Scientist & Engineer

Support the commercialisation of renewable technologies

There are increasing commercial opportunities for NSW to facilitate the development of renewable technologies across the innovation chain, from research to demonstration.

Bioenergy

NSW is well placed to lead development and supply of sustainable biomass for electricity and transport. The NSW Government will continue to support innovative R&D of the bioenergy industry, including off-grid generation opportunities.

Action 19

Establish a working group to develop an advanced bioenergy initiative supporting supply and demand for renewable transport fuels and power generation.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Action 20

Support research and development in advanced bioenergy applications in collaboration with Rural Climate Solutions at the University of New England.

Responsibility: Department of Primary Industries

Geothermal

The NSW Government is working with industry and research bodies to identify suitable locations of geothermal resources. This could inform potential geothermal hybrid demonstration projects.

Action 21

Actively support research into innovative and commercially viable applications of geothermal assisted power generation.

Responsibility: Office of the NSW Chief Scientist & Engineer

Action 22

Identify opportunities to support the integration of geothermal projects and coal-fired power stations.

Responsibility: NSW Trade & Investment – Division of Resources and Energy

Wave and tidal

NSW Government support for the Port Kembla wave demonstration plant assisted the commercial development of wave technologies. The NSW Government will continue to encourage efforts to realise wave, ocean and tidal energy potential.

Action 23

Support R&D in wave and tidal technologies.

Responsibility: Office of the NSW Chief Scientist & Engineer

Smart grids

NSW is home to Australia's first commercial-scale smart grid. Harvesting and applying the findings from this project will enable NSW to deliver a more stable and reliable energy supply for consumers while integrating renewable energy and embedded generation technologies. Diverse submissions including 450ppm, BlueScope Steel and the City of Lake Macquarie supported further work in this area. The NSW Government will continue to lead on smart grids as renewable energy enablers.

Action 24

Continue to support research and deployment of smart grid technologies.

Responsibility: NSW Trade and Investment – Division of Resources and Energy working with Office of the NSW Chief Scientist & Engineer

Delivery of the Plan

The NSW Government will support the delivery of this Plan with clear governance arrangements and new structures.

The Minister for Resources and Energy will lead on the delivery of the Renewable Energy Action Plan, working with the Parliamentary Secretary for Renewable Energy and the Renewable Energy Advocate to report on progress.

The Renewable Energy Action Plan will be implemented alongside the Energy Efficiency Action Plan, recognising the common policy intent of these partner plans is to attract investment, grow expertise, build community support and contain electricity costs for customers.

The implementation of the NSW Renewable Energy Action Plan will be guided by the NSW Economic Development Framework. The Framework, released by the Deputy Premier in December 2012, emphasises that it is only through partnerships with industry, education and research organisations and all levels of government that we will achieve our vision of dynamic economic growth.

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NSW Trade & Investment