Rob Stokes MP

Parliamentary Secretary for Renewable Energy
Member for Pittwater

14 September 2012

Climate Change Authority
GPO Box 1944
MELBOURNE VIC 3001

Thank you for the opportunity to provide a submission in relation to the review of the Renewable Energy Target.

As the Parliamentary Secretary for Renewable Energy in NSW, I am keen to assist in the delivery of a secure, affordable and ecologically sustainable energy system, and to promote renewable energy development in NSW at least cost to consumers.

The Renewable Energy Target has played a significant role in driving investment in renewable energy at least cost to cost to consumers. The NSW Government has prepared a *Draft Renewable Energy Action Plan* to support the achievement of the national target of 20% renewable energy by 2020. Please find a copy of the draft plan attached to this letter.

In relation to the review of the Renewable Energy Target, I wish to make the following general observations about designing cost effective renewable energy policies:

- policies to encourage renewable energy deployment need to be coordinated, with clear division of responsibility between different levels of government;
- policies need to be efficient, to encourage the development of renewable energy at the lowest cost and maximum benefit to electricity consumers; and
- policies need to support sustainable levels of investment and industry growth, not boom and bust cycles.

Recent history of the failure of various state-based schemes demonstrate that poorly planned, co-ordinated or delivered policy not only fails to deliver the best possible outcome in terms of renewable energy generated, but also in terms of community support for renewables.

Such policies also fail to provide a stable and predictable investment environment, which can undermine investor confidence. It is therefore imperative that the review is taken in the context of providing a clear, certain and predictable policy framework to guide investment decisions in renewable energy.

I wish you the best in reviewing the Renewable Energy Target so as to improve certainty and simplicity in its design and operation.

Yours sincerely,

DR ROB STOKES MP
PARLIAMENTARY SECRETARY FOR RENEWABLE ENERGY
MEMBER FOR PITTWATER

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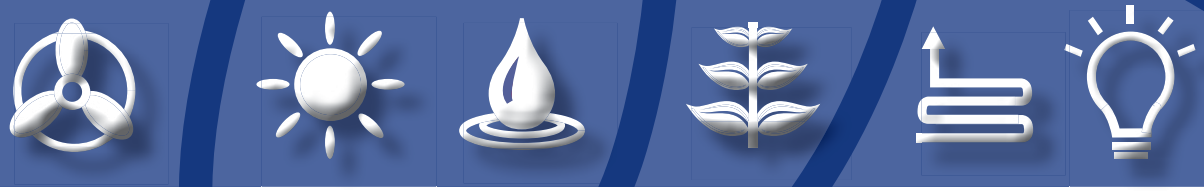
NSW GOVERNMENT

DRAFT NSW Renewable Energy Action Plan



Foreword

Rob Stokes
Parliamentary Secretary
for Renewable Energy

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

Renewable energy provides a pathway to achieving 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 world-class research and development capacity in 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 the members of the joint industry-government Renewable Energy Taskforce for their assistance in the preparation of this Plan.

Taskforce Members

Professor Mary O'Kane
NSW Chief Scientist and Engineer (Chair)

Dr Brian Spalding
Commissioner Australian Energy Market Commission

Steve MacDonald
CEO Transfield Services

Mark Twidell
Managing Director Australian Solar Institute

Matthew Warren/Kane Thornton
CEO Clean Energy Council

Simon Smith
Deputy Director General
Department of Premier and Cabinet

Kevin Cosgriff
Deputy Secretary NSW Treasury

Mark Duffy
Deputy Director General NSW Trade and Investment
(Division of Resources and Energy)

Executive Summary

A secure, affordable and renewable energy future for NSW

A NSW Renewable Energy Action Plan is being developed to support 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 each of the renewable energy technologies in NSW. Current forecasts show that 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 new proposals to most efficiently grow renewable energy generation in NSW, with new 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
4. Contain costs for energy customers through increased energy efficiency.

Have your Say

This draft Plan has been prepared as a basis for consultation with industry and the broader community.

The Plan has been developed with assistance from a joint industry-government Renewable Energy Taskforce. The actions in the Plan have been developed based on initial discussion with industry and include ideas raised at the Solar and Renewable Energy Summit held on 1 July 2011.

Please have your say on this important Plan by providing a submission or participating in our online forum at **www.haveyoursay.nsw.gov.au/renewableenergy**

Submissions will be accepted and the forum will be open until 26 October 2012.

NSW will attract renewable energy investment

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

- Improve network connections
- Streamline the planning process
- Create a supportive policy and regulatory environment
- Promote investment opportunities in NSW
- Establish a fair price for solar and provide a sustainable future for the solar industry

NSW will build community support

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

- Prepare new planning guidelines for wind energy projects
- Engage communities early and effectively in renewable energy projects
- Support community-owned renewable energy projects

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:

- Create renewable energy hubs
- Lead on research and innovation
- Support the commercialisation of renewable technologies

NSW will contain customer costs through energy efficiency

The NSW Government will place downward pressure on electricity costs to customers by driving energy efficiency and maximising use of our existing networks. We will:

- Release a new strategy for energy efficiency
- Work to harmonise energy efficiency schemes
- Improve standards of energy efficiency in buildings and appliances
- Arm consumers with better information

Contents

1 Introduction

The NSW Renewable Energy Action Plan positions NSW to grow renewable energy to support the national 20% by 2020 target 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 new 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
4. Contain costs for energy customers through increased energy efficiency.

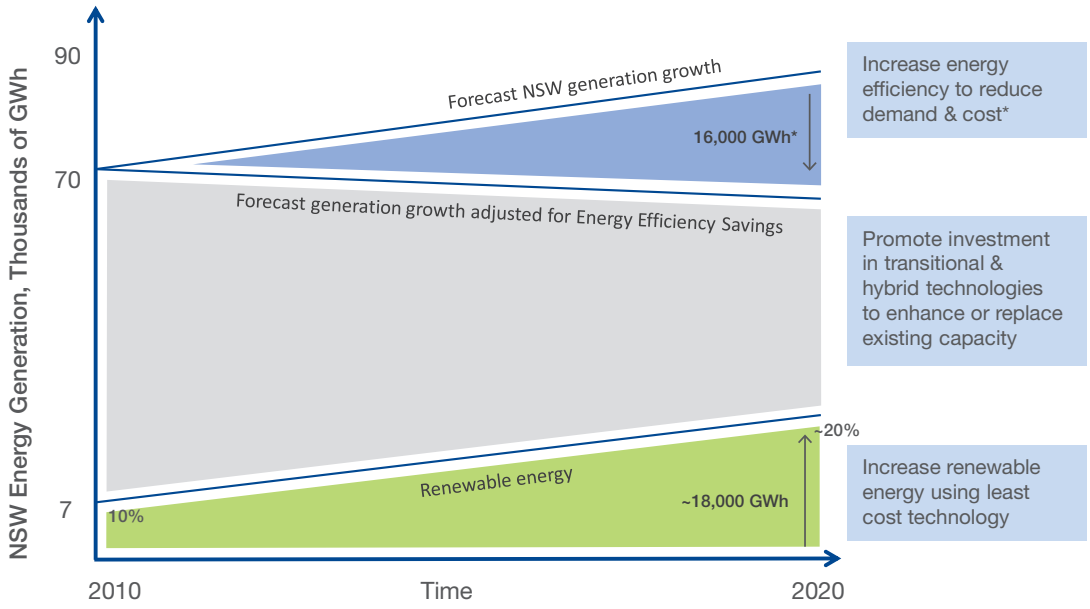
A secure, affordable and clean energy future

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 that attracts new jobs and investment to NSW at the lowest possible cost. Increasing renewable energy generation is a critical part of our energy solution.

We also intend to counteract the increase in energy demand and cost through more efficient use of energy in homes and businesses. Energy efficiency has the potential to reduce consumers' electricity bills and delay expenditure on new electricity infrastructure. By assisting businesses and households to realise annual energy savings of 16,000 GWh by 2020, electricity costs estimated at $2.8 billion will be avoided in 2020.

This Plan strengthens the links between renewable energy and energy efficiency policy. Energy efficiency allows us to offset the costs of diversifying our energy supply at the same time as increasing our energy productivity.

Figure 1 – Forecast growth in energy generation to meet demand in 2020



Source: NSW Government

*Note: Energy efficiency savings targeted in NSW 2021 – "Contain Electricity Costs through Efficient Energy Use: Assist businesses and households to realise annual energy savings of 16,000 GWh by 2020 compared to 'business as usual' trends"

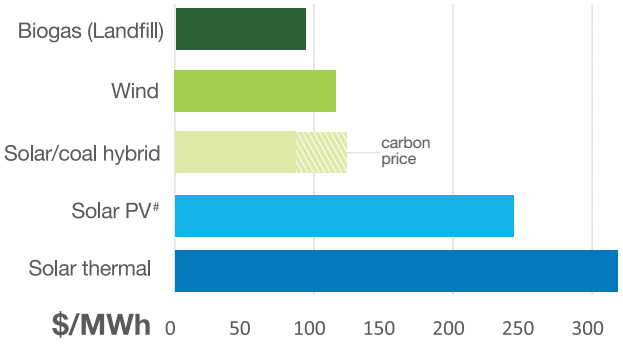
Note: Electricity can be sourced from anywhere across the National Electricity Market (NEM).

Renewable energy at least cost

The NSW Government will focus on the best value-for-money solution to deliver our renewable energy commitments and support achievement of the national target. The cost of renewable energy technologies varies considerably between 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 2 – Comparative costs of renewable technologies in NSW (utility-scale 2012)



Source: Bureau of Resources and Energy Economics, 2012

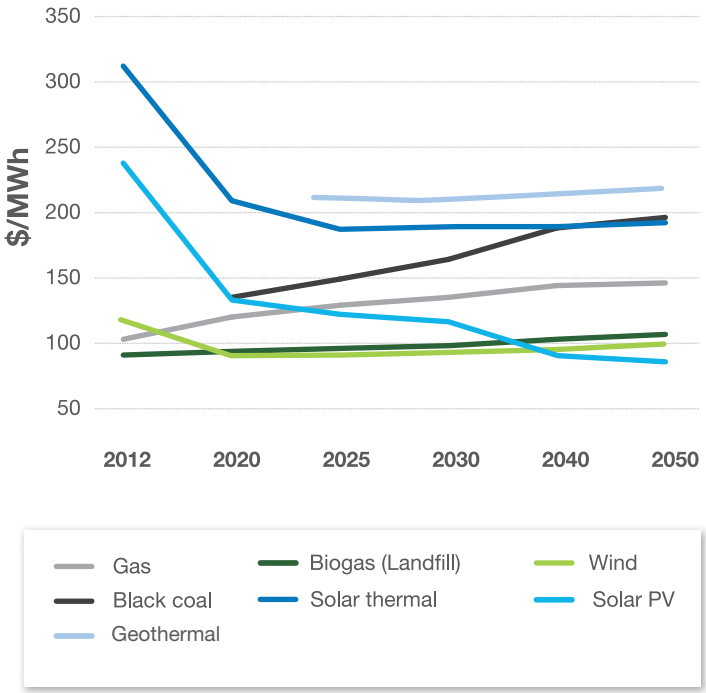
Note: The bars indicate the levelised cost by technology for a new-build utility scale plant. A$/MWh are presented in 2012 values and includes the carbon price.

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

#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 3 – Predicted change in costs of electricity 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.

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).

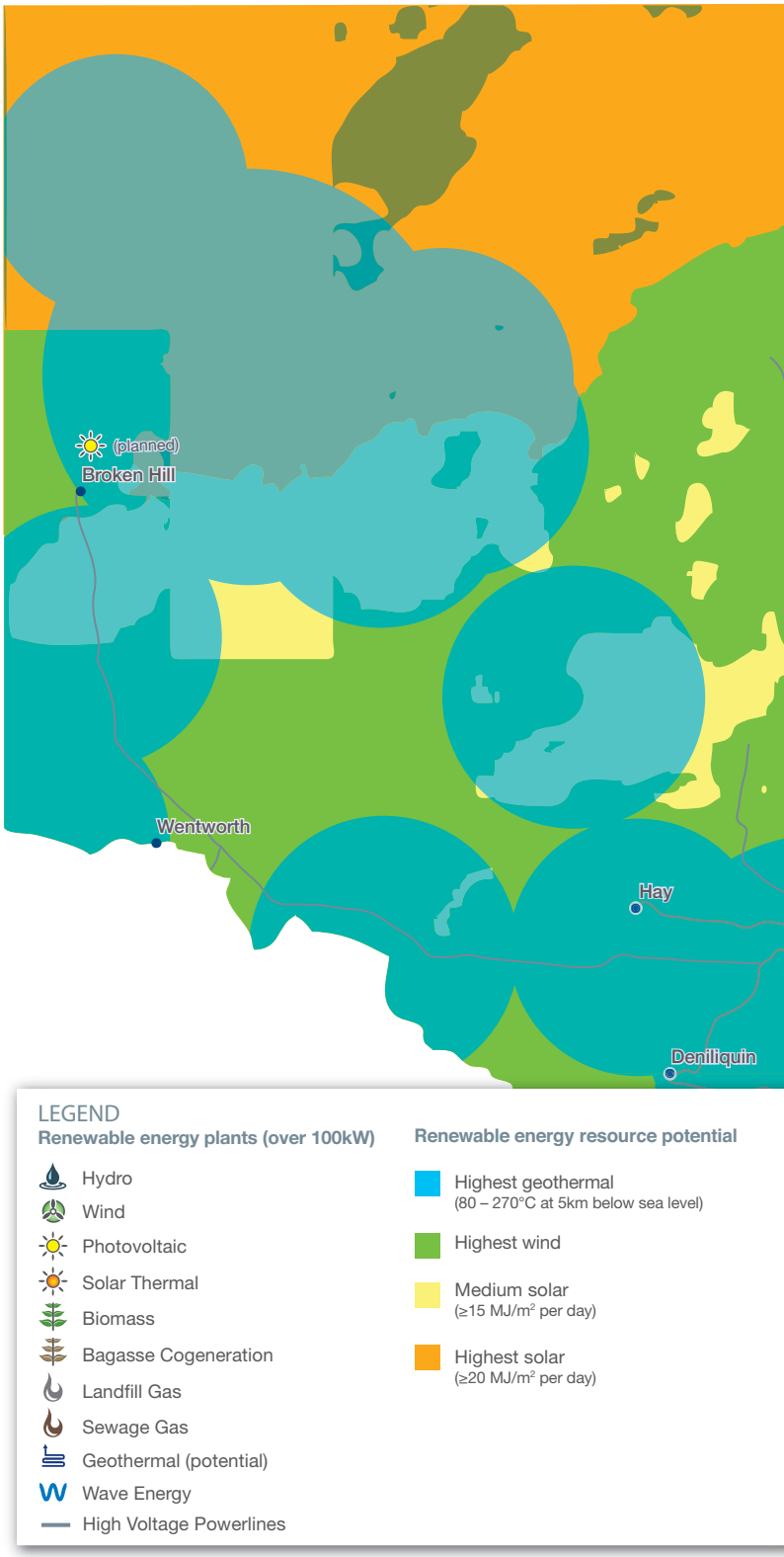
The NSW Government will seek to attract a large proportion of this investment in renewable energy to NSW. Individual private sector investors will base their locational decisions not only on the energy resource and grid connection fundamentals in each state, but also on how open each jurisdiction is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

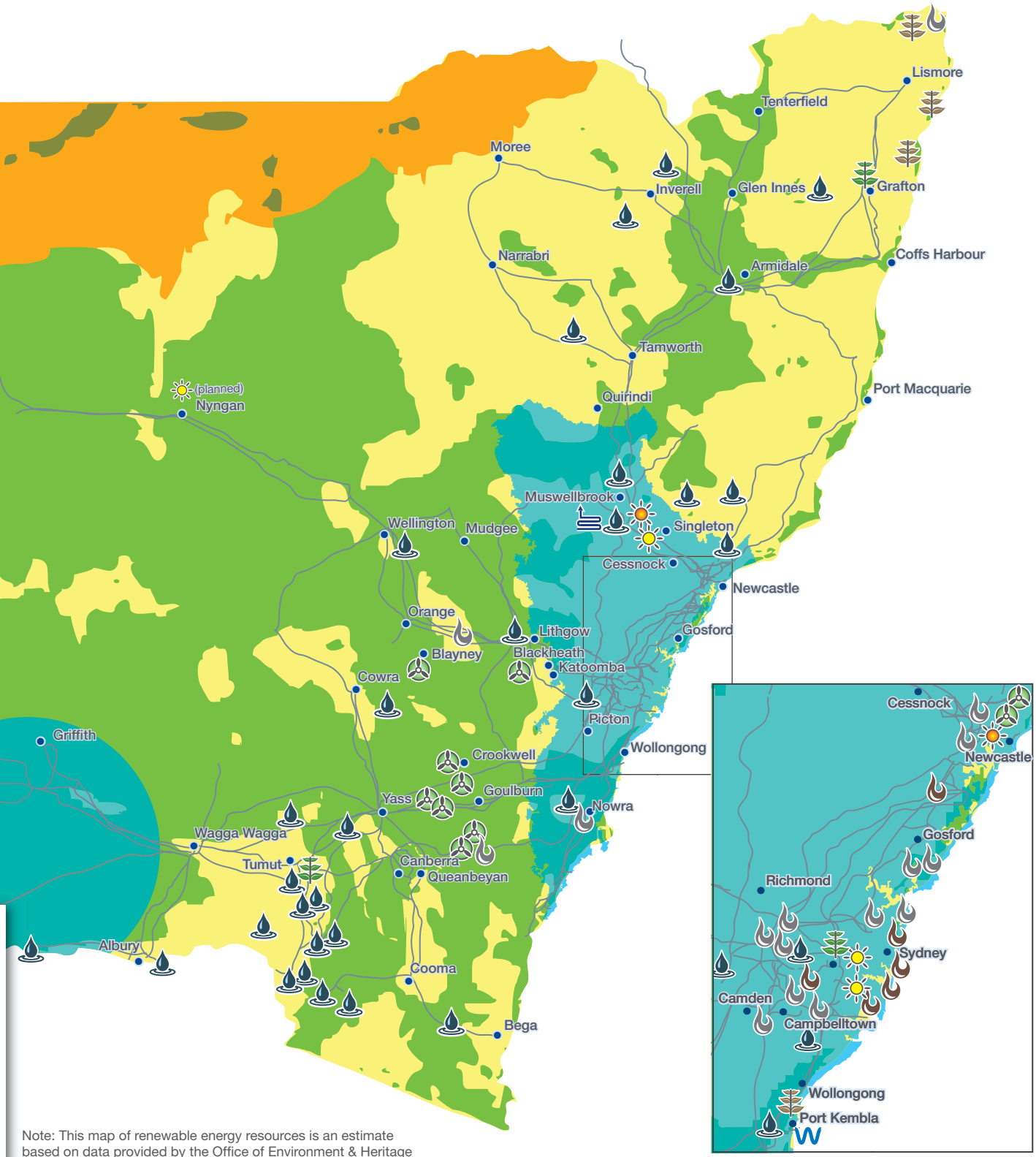
New renewable energy jobs

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 located 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 research and development hubs. For example, the new $40 million Newcastle Institute for Energy and Resources at the University of Newcastle will support 70 research staff when it is fully operational in May 2013. In addition, the Clean Energy Finance Corporation, to be located in Sydney, will create 40 new jobs. NSW continues to attract international renewable energy companies to locate their Australasian headquarters in Sydney.

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.

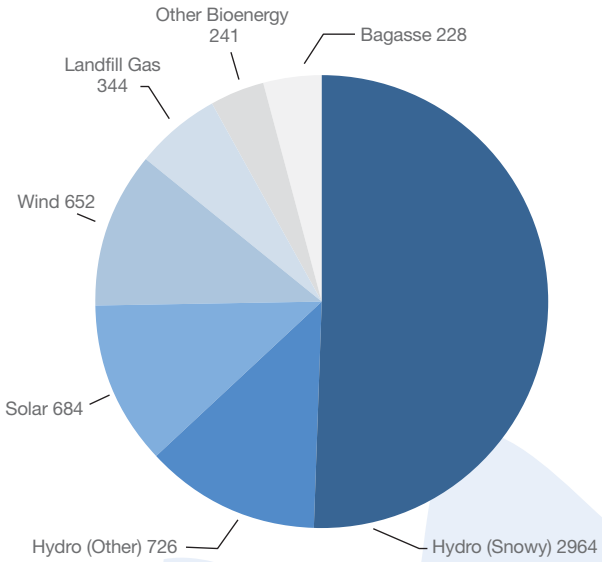
2 Opportunities for renewable energy in NSW

NSW has a growing mix of renewable energy.

In 2010 approximately 10.2%, or 7,456 GWh, of electricity generated in NSW was from renewable energy sources.

In 2011, renewable energy generation in NSW dropped to approximately 7.8%, or 5,840 GWh. The variation is a result of lower generation levels of hydroelectricity from the Snowy Mountains hydroelectricity scheme, which currently 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.

Figure 4
NSW renewable energy generation in 2011 (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 currently under construction or have been approved through the planning system NSW will increase generation from renewable sources to 12,000 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 butanol.

In 2011, NSW generated approximately 800 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 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. In 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. In Nowra, on the south coast of NSW, Manildra operates one of the three distilleries in Australia manufacturing ethanol, primarily for use as a transportation fuel. Also in Nowra, Algaetec has just commenced production of algae biomass on an industrial scale from its showcase biofuels facility.

NSW is also supporting the biofuels industry with a 6% mandate for the use of biofuels, such as ethanol, in all petroleum fuels sold in this State. Ethanol-fired power plants constructed in Brazil using General Electric technology demonstrate that biofuels may also have significant potential for use in electricity generation.

NSW has world-class biofuel research and development facilities, such as the work being 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

Commercial interest in energy generation from NSW's geothermal resources is increasing in NSW. NSW has strong potential enhanced geothermal systems resources ('hot dry rocks') that are located close to customers, generators and networks, with an estimated 55 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, as well as commissioning 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 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 is currently doubling the size of the existing solar array to 9 MWth, which will make the Liddell power station the largest solar thermal energy project in the Southern Hemisphere. The energy generated will be used to heat feedwater for the power station and will supply renewable energy for over 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. In 2011 hydropower comprised 63% of our renewable and 5% of our total electricity 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 MW in potential generation on several dozen sites in NSW. A recent example is the new 3.7 MW Hydroelectricity plant installed at Prospect Reservoir in Western Sydney. The NSW Government is currently researching improvements so that 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 UNSW'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.

NSW has the largest installed capacity of solar photovoltaic panels in Australia. In 2011, NSW generated 684 GWh of solar energy from 392 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 1,870 MW installed rooftop PV capacity in 2020 and 5,560 GWh from 4,450 MW 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 $441.36 million project, to be developed by AGL and First Solar, will produce 159MW – enough electricity to power around 30,000 homes. The project will be built over two NSW sites and will create around 185 direct jobs at Broken Hill and up to 300 at Nyngan.

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

NSW is at the forefront of solar research and development. The CSIRO Solar Tower in Newcastle is the largest solar thermal research facility in Australia with a capacity of 200 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, this project will design and install 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 500kW 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 the further commercial development of oscillating water columns technology with future opportunities now being explored.

The NSW Government will encourage further research and development 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 2011 wind power contributed 652 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. NSW has around 2,000 MW of new wind generation proposals with development consent and an additional 6,700 MW under assessment through the planning system. Between now and 2013 wind projects with development consent or in the planning assessment phase have the potential to add between 875 – 1,085 MW of additional capacity, generating $1.9 – 2.3 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 trialling 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.

3 Attract renewable energy investment

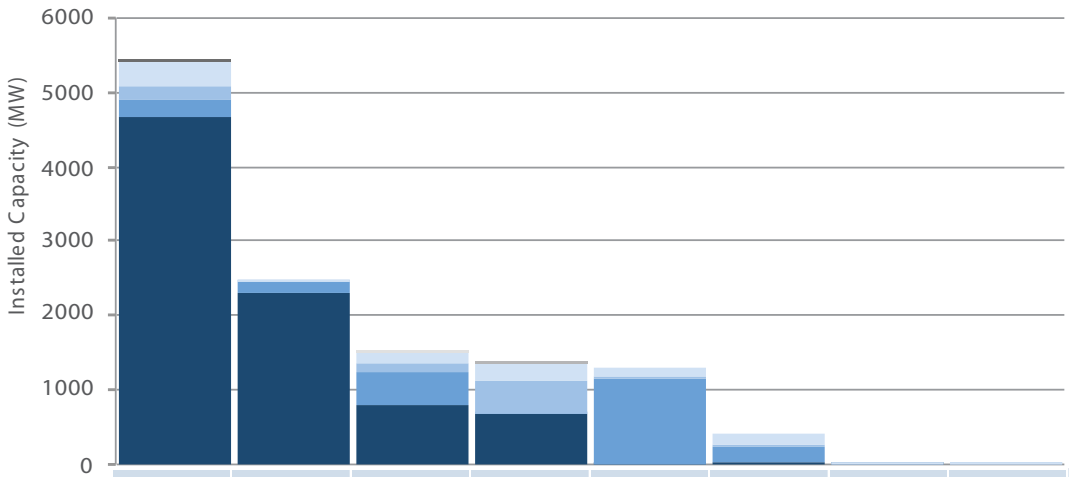
With the largest installed renewable energy capacity in Australia, and with abundant renewable energy resources, NSW is well positioned to attract future renewable energy development. Our leading research and development facilities are paving the way for technology performance improvements and our commitment 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
- establishing a fair price for solar and a sustainable solar industry.

Figure 5 – Installed capacity of renewable energy by state and territory (2011)



	NSW	TAS	VIC	QLD	SA	WA	ACT	NT
Hydro	4677	2316	803	669	4.4	30	1.3	0
Wind	234	142	432	12	1151	204	0	0
Bioenergy	166	5.1	113	429	20	33	4.4	1.1
Solar PV	328	8.3	152	256	130	141	19.3	6.1
Solar Thermal	3.2	0	0	0	0	0	0	0
Geothermal	0	0	0	0.1	0	0	0	0
Wave	0	0	0.15	0	0	0.1	0	0
Total MW	5408	2471	1500	1366	1305	408	25	7

Source: Clean Energy Council Report 2011
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.

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 that energy resources are linked spatially to demand and network capabilities, enabling easy identification of opportunities and constraints
- develop and publish 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 – 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.

Under the current system, the Planning Assessment Commission has been given responsibility for determining development applications for 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.

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, and
- 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.

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

The new Renewable Energy Advocate within 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 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. They 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 creation 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.

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

Establish 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 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, and
- support a competitive electricity market in NSW.

The IPART review was finalised in March 2012. IPART recommended setting a voluntary benchmark price range for small-scale generated solar of 5kWh and improving information disclosure requirements so customers can readily access price comparisons.

The Government accepted IPART's advice and requested that IPART set a benchmark range each year. The benchmark tariff will reflect the financial gains received by a retailer and should therefore not result in a cost being passed through to customers. On 27 June 2012, IPART published its first determination for a benchmark range to apply for 2012/13. IPART determined this range to be 7.7–12.9 cents per kilowatt hour (c/kWh) for electricity exported to the grid from small-scale photovoltaic customers.

There continues to be significant demand for small-scale solar PV, with 42,632 customers applying to connect small generators since the closure of the Solar Bonus Scheme (as at 18 May 2012).

Action 6

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

Responsibility: NSW Trade & Investment

Mid-scale solar PV will become increasingly attractive as prices for installation on rural allotments, large industrial, commercial or community rooftops are becoming comparable to 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 cost effective and
- facilitate the uptake of mid-scale solar PV for commercial buildings.

Action 7

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
- identification of opportunities and facilitation of uptake of distributed energy technologies where they are most cost effective
- hold a seminar on Environmental Upgrade Agreements legislation and how it can be applied to renewable energy deployment
- identify priority commercial areas and industries for commercial-scale PV based on identification of areas where there are existing network constraints and of sectors with high electricity costs during the day.

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

To support large-scale solar in NSW, the NSW Government will contribute $64.85 million in funding for the development of the solar PV project built in Broken Hill and Nyngan. The $441 million 159 MW project, built under the Commonwealth Solar Flagships Program and to be developed by AGL and First Solar, will produce enough electricity to power 30,000 homes and deliver up to 185 jobs in Broken Hill and up to 300 jobs in Nyngan.

Action 8

Engage with the Commonwealth Government to facilitate construction of the Solar Flagships project in Broken Hill and Nyngan, with $64.85 million in funding from the NSW Government.

Responsibility: Office of Environment & Heritage

4 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:

- developing new 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.

Prepare new planning guidelines for wind energy projects

Rigorous assessment of proposals for wind energy projects is essential to avoid the negative impacts that poorly-planned projects can have on local communities.

The NSW Government is developing clear planning guidelines to ensure that new wind energy projects minimise impacts on local communities.

Action 9

Finalise NSW wind energy planning guidelines to provide greater certainty, consistency and transparency to industry and to provide communities with greater confidence that issues are being appropriately considered.

Responsibility: Department of Planning & Infrastructure

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.

The NSW Government will review the existing Renewable Energy Precinct Program to improve and expand the program so that local renewable energy co-ordinators are available to 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 renewable energy co-ordinators to engage more broadly across a variety of renewable technologies and across a broader area of NSW. There is the opportunity for the renewable energy co-ordinators to more strongly promote energy efficiency and demand side solutions to the community, business and industry.

Action 10

Review the current Renewable Energy Precinct Program with the view to expand the role of the renewable energy co-ordinators so that they support the community in their engagement with all renewable energy projects across a greater area of NSW. The expanded role would 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
- working with the Renewable Energy Advocate to identify and facilitate opportunities for demand side projects based on liaison with network companies
- providing data and information for all stakeholders.

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 commonplace 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 other sectors in NSW (eg. 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 want 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 reflects the views of over 1,300 people and organisations directly involved in the study and covered governance issues, location of the turbine, 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.

To help communities in other areas that also want to develop locally owned renewable energy get started, the NSW Government will provide funding for pre-feasibility studies and project facilitation support from regional co-ordinators within the Renewable Energy Precincts.

Action 11

Facilitate community ownership of renewable energy projects by providing funding for local feasibility studies for up to five community renewable energy projects.

Responsibility: Office of Environment & Heritage

5 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.

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, which is to be located in Sydney.

Australian Renewable Energy Agency – is a $3.2 billion agency consolidating support for renewable energy technology development. It includes Solar Flagships Round 1; 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 – $10 billion commercially oriented Finance Corporation to 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 will be 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 in this state.

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 research and development before they can attract significant capital investment. In the meantime NSW can be clever in 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 explore potential hubs where geographic location of renewable energy resources may create opportunities.

For example, Newcastle is a hub for energy research and deployment with its associated infrastructure: CSIRO Energy headquarters; CSIRO Energy Transformed Flagship; Australian Solar Institute; the Australian Research Council (ARC) Centre of Excellence in Geotechnical Science and Engineering and the Newcastle Institute of Energy and Resources at the University of Newcastle, Smart Grid Smart City Project; Energy Enterprise Connect Centre and the Hunter TAFE.

The NSW Government will also investigate opportunities to support commercially integrated renewable energy services demonstration projects within new residential and industrial development areas.

Action 12

Investigate opportunities to support renewable energy experience centres/demonstration projects to provide commercial-scale demonstration of renewable energy technologies and demonstration of best practice in residential development.

Responsibility: NSW Trade & Investment

Action 13

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 Australian Renewable Energy Agency and the Clean Energy Finance Corporation to maximise innovation and research opportunities.

Action 14

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 (eg. wave technology)
- Identifying opportunities to provide undergraduate engineering and postgraduate research scholarships (eg. modelled on the existing Ausgrid scholarships).

Responsibility: NSW Trade & Investment

Action 15

Establish a NSW Government Prize for Renewable Energy Innovation 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, from research to demonstration.

Bioenergy

NSW is well placed to lead development and supply of renewable transport fuels. The NSW Government will continue to support innovative research and development of the bioenergy industry, including off-grid generation opportunities.

Action 16

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

Responsibility: NSW Trade & Investment

Action 17

Support research and development in advanced bioenergy applications through 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 18

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

Responsibility: Office of the NSW Chief Scientist & Engineer

Action 19

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

Responsibility: NSW Trade & Investment

Wave and tidal

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

Action 20

Support research and development 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. The NSW Government will continue to lead on smart grids as renewable energy enablers.

Action 21

Continue to support research and deployment of smart grid technologies.

Responsibility: Office of the NSW Chief Scientist & Engineer

6 Contain customer costs through energy efficiency

NSW will place downward pressure on the costs to electricity customers by driving energy efficiency and optimising the use of electricity networks.

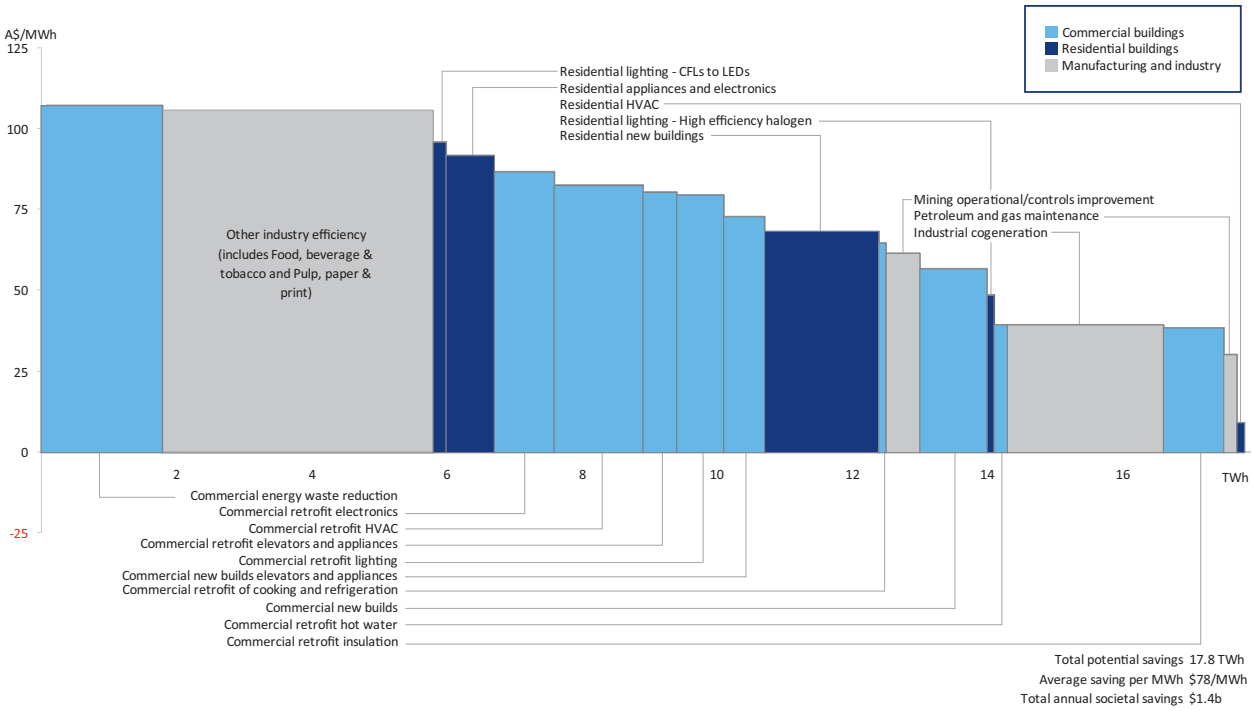
Activities to reduce or manage electricity use can be much cheaper than building new or upgraded power stations, substations and powerlines. Many energy efficiency measures do, in fact, lead to savings.

Energy efficiency measures and other demand management initiatives provide energy savings that delay the requirement for increased generation and network infrastructure and optimising the use of existing networks. This puts downward pressure on energy prices and reduces greenhouse emissions.

The NSW Government will work to contain electricity costs through energy efficiency by:

- releasing a new strategy for energy efficiency that incorporates the most effective energy efficiency programs
- work to harmonise energy efficiency schemes
- improving standards for energy efficiency in buildings and appliances
- arming customers with better information.

Figure 6 – Potential annual NSW savings from energy efficiency measures



Source: Office of Environment and Heritage, NSW Government
This cost curve has been developed for NSW in 2011 based on the McKinsey methodology.

Release a new strategy for energy efficiency

The NSW Government and network businesses have implemented a number of demand management and energy efficiency programs and are supporting the development of demand management initiatives at a national level.

However, there remain a number of barriers that are preventing widespread uptake of energy efficiency measures by consumers and businesses. These include lack of information and difficulty in assessing options, and split incentives where the benefit of the energy savings does not flow to the party that incurred the cost (eg. upgrades to leased buildings).

The barriers to energy efficiency mean that the market for energy-efficient products and services is not as developed as other energy products (such as options to buy 'GreenPower' or install solar panels). The NSW Government is directly encouraging consumers to take up energy savings opportunities through subsidised audits, technical support and training; and encouraging market development through market-based mechanisms such as the NSW Energy Savings Scheme.

Action 22

Prepare an Energy Efficiency Strategy to guide ongoing funding of the most effective energy efficiency programs. This will involve a review of the effectiveness of all current energy efficiency programs and identification of an improved suite of programs.

Responsibility: Office of Environment & Heritage

Work to harmonise Energy Efficiency Schemes

NSW has led the development of cost effective investment in energy efficiency through the NSW Energy Savings Scheme. The scheme requires NSW electricity retailers to meet annual energy savings targets by investing in projects that demonstrate energy savings for households or businesses.

To date, the Energy Savings Scheme has delivered energy savings equivalent to over 1,400 GWh through 61 private sector energy savings projects. The Scheme is projected to save an estimated 3,200 GWh of electricity each year from 2014 to 2020. It will also help reduce future rises in household electricity bills by an average of $50 each year, support up to 1,000 jobs and stimulate our growing energy efficiency industry with up to $1 billion of additional investment.

To help minimise red tape for the Energy Saving Scheme participants who operate in multiple jurisdictions, and to further develop the market for energy efficiency activities, the NSW Government has agreed to work with Victoria to increase harmonisation between the NSW and Victorian energy efficiency schemes. This can then be used to inform possible further harmonisation at a national level. This will help ensure that the Energy Savings Scheme can be delivered in a way which is least cost to the electricity retailers, while still delivering energy savings for households and businesses.

Action 23

NSW will work with Victoria to identify opportunities for increasing harmonisation of the NSW and Victorian energy efficiency schemes. This will help cut red tape for scheme participants operating in multiple states and lead to further development of the market for energy efficiency activities. It will also help inform opportunities for further national harmonisation.

Responsibility: Department of Premier & Cabinet

Improve standards of energy efficiency in buildings and appliances

The NSW Government operates state and national programs which set requirements to ensure energy efficiency is built into products and services.

- The NSW Building and Sustainability Index (BASIX) places energy and water performance standards on all major renovations and new residential buildings. These cover construction type, building materials, house design and types of fixed appliances.
- The national Minimum Energy Performance Standards (MEPS) keeps the worst performing electrical appliances out of Australia and give consumers information to help them zchoose more efficient appliances.
- The National Australian Built Environment Rating Scheme (NABERS) enables the energy performance of different types of buildings (offices, hotels, and shopping centres) to be rated and compared to average performance. The NSW Government manages this scheme on behalf of the Commonwealth Government and other States and Territories.

The NSW Government is driving change in the commercial property market by targeting government owned or tenanted office buildings over 1000m^2 to achieve and maintain a rating of 4.5 stars for energy and water.

Very large electricity users in NSW have been required to prepare Energy Savings Actions Plans to reduce their consumption. So far 206 businesses, 15 government agencies and 46 local councils have reported combined savings of 395,000 tonnes of greenhouse gas emissions by implementing cost effective energy efficient actions identified in their plans.

In addition, NSW has introduced innovative arrangements to accelerate energy efficiency improvements in commercial and large multi-unit residential buildings through Environmental Upgrade Agreements. Under Environmental Upgrade Agreements, building owners invest in a retrofit of their building, and repay this finance through a voluntary local council charge. These voluntary agreements will improve access to project finance for upgrades, and help to remove the 'split incentive' barrier that deters landlords from investing in energy savings measures that benefit tenants. The Renewable Energy Advocate will contribute to raising awareness of Environmental Upgrade Agreements (Action 7).

Action 24

Deliver high standard building retrofit programs so that 50% of NSW commercial floor space achieves a 4-star NABERS energy rating by 2020.

Responsibility: Office of Environment & Heritage

Arm households and businesses with better information

NSW has a co-ordinated group of programs that provide targeted information, energy audits and energy savings advice to households and businesses. This addresses the costs involved in searching for information about ways of saving energy, which is one of the key barriers limiting the uptake of cost-effective energy saving activities. Every dollar invested in these programs ultimately returns at least $2 on average in saved electricity infrastructure. Current programs in NSW include:

- The Home Power Savings Program provides 220,000 free home energy assessments and energy saving kits for eligible low income households in NSW. Households in the program have saved up to 1 MWh of energy consumption each year or up to $230 off their energy bills each year.

- The Energy Efficiency for Small Business program provides on-site energy efficiency advice and matched rebates for cost effective measures of up to $5,000. More than 16,000 businesses have participated in this program to January 2012, and have identified potential electricity bill savings of $1,600 per annum.
- The Sustainability Advantage Energy Saver program targets 800 medium to large businesses with leading-edge energy saving measures to cut their energy use by an average of 10%. Supports include subsidies to identify energy saving opportunities through audits, and help to implement projects. 400 organisations have participated to June 2011.
- The Energy Efficiency Training program is training 20,000 skilled tradespeople and professionals with the skills needed to deliver the new energy saving products and services in priority sectors such as manufacturing, property, building and construction.
- The Energy Efficiency Community Awareness program includes a range of initiatives to improve community and business awareness and knowledge of energy efficiency actions such as the broad-scale "Save Power" campaign, library kits and in-store information on energy efficient appliances. Under the Save Power campaign, 80% of NSW residents have seen or heard advice and tips to save power, and two thirds of these people were motivated to change or to start thinking about it.
- GreenPower is a joint initiative of the ACT, NSW, SA, QLD, VIC and WA governments. The program enables energy providers to purchase renewable energy on behalf of consumers who have agreed to a percentage of their energy consumption coming from a renewable source. In 2011 a total of 501,274 MWh of GreenPower was purchased in NSW by both residential and commercial consumers. The program aims to facilitate the installation of new Renewable Energy generators across Australia beyond mandatory renewable requirements.

Action 25

Support 220,000 low income households to reduce energy use by up to 20% by June 2014 through programs such as the *Power Savings Kit* and advice on behaviour change.

Responsibility: Office of Environment & Heritage

Action 26

Empower energy customers to change behaviour and reduce energy bills by providing simple and accessible information on the average electricity usage of common appliances and fittings.

Responsibility: Office of Environment & Heritage

Action 27

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

Responsibility: 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 28

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; and
- ensures net benefits for NSW homes and businesses, while delivering reliable electricity supply.

Responsibility: NSW Trade & Investment

7 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 continue to lead on the finalisation and delivery of the Renewable Energy Action Plan. The Minister for the Environment will continue to lead on Energy Efficiency Programs and bring forward the strategy for implementation of the NSW 2021 energy savings target that will complement the renewable energy targets.

The Renewable Energy Taskforce will have an ongoing role in overseeing the delivery of the Renewable Energy Action Plan. The Taskforce will continue to work with the Parliamentary Secretary for Renewable Energy and the Renewable Energy Advocate to track progress on delivery of the Plan and report on progress to the Ministers and Cabinet.

8 Have your Say

Please have your say on this important Plan by providing a submission or participating in our online forum at

www.haveyoursay.nsw.gov.au/renewableenergy

You can also post submissions to:

Renewable Energy Action Plan
Resources and Energy
NSW Trade & Investment
GPO Box 3889
Sydney NSW 2001

Submissions will be accepted and the forum will be open until 26 October 2012.

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