

The Queensland Renewable Energy Plan

A Clean Energy Future for Queensland



June 2009



Queensland is ready for a renewable energy revolution

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1.0

Foreword

Our state is rich in renewable energy resources—solar, geothermal, biomass, wind, hydro—and now we've created a raft of new actions and a broad policy platform to expand the sector and accelerate our economy towards a clean energy future.

The Queensland Renewable Energy Plan sets out how we intend to support and grow this incredibly important and rapidly emerging global sector in our state.

Queensland has signed up to the national renewable energy target of 20 per cent of Australia's electricity supply to come from renewable energy sources by 2020.

The Federal Renewable Energy Target plan aims to stimulate about \$12 billion of investment in renewable energy across the country by 2020.

Through the measures outlined in our plan we are seeking to leverage \$3.5 billion of that investment creating 3,500 jobs in these exciting new industries.

This will result in the generation of 9,000 gigawatt hours or approximately 2,500 megawatts of Queensland based renewable energy by 2020 – and that will reduce our greenhouse gas emissions by more than 40 million tonnes by 2020.

Our plan outlines a holistic approach to industry development. It creates new opportunities for Queensland's energy sector based on collaboration and strategic partnerships.

Our plan also shows how effective planning and targeted incentives will be good for the Queensland economy and create new 'green' jobs now and into the future.

Importantly, the Queensland Renewable Energy Plan complements energy initiatives to slow the growth of the state's energy consumption, manage peak demand and avoid costly network upgrades.

My Government recognises that climate change is one of the great challenges of our age. With this plan we continue our efforts to rise to that challenge.



Anna Bligh MP
Premier of Queensland



Stephen Robertson MP
Minister for Natural Resources, Mines
and Energy and Minister for Trade





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2.0 Executive summary

Queensland has been proactive in its approach to climate change—the government has committed to a national greenhouse gas emissions target of 60 per cent below 2000 levels by 2050 and developed a suite of initiatives aimed at abatement and adaptation. Key to achieving the state’s emissions reduction targets will be the continued expansion of the renewable energy sector.

The Queensland Renewable Energy Plan is a comprehensive economic and industry development strategy aimed at accelerating the growth of the renewable energy sector in Queensland. The Plan is broad in scope and includes a raft of initiatives aimed at addressing areas of market failure, driving regulatory reform, streamlining planning processes, removing non-economic barriers and facilitating technological innovation. It will position the state to lead the national renewable energy agenda while detailing mechanisms to attract a maximum share of investment under the expanded national Renewable Energy Target.

The primary objective of the Plan is to increase the deployment of renewable energy infrastructure in Queensland. This means providing the right incentives to encourage industry to move beyond business as usual and look for new opportunities.

The Queensland Government estimates that successful implementation of the Plan will help to leverage up to \$3.5 billion in new investment, create up to 3,500 new jobs and reduce greenhouse gas emissions by more than 40 million tonnes by 2020.

Queensland is set to become Australia’s solar hot water state, with the Queensland Solar Hot Water Program to accelerate the installation of up to 200,000 solar hot water systems over three years. The program will reduce the household electricity bills of participants by approximately 25 per cent and decrease emissions from household electricity use by up to 30 per cent. The Program represents one of the largest and most complex industry transformation projects of its kind in Queensland.

With Queensland’s renewable energy resources primarily located outside of major population centres, an important objective of the Plan is to maximise regional development opportunities. A pilot project aimed at powering the state’s most isolated communities with renewable energy alternatives will commence and be evaluated over the next year to determine whether there should be a state-wide rollout. There is significant potential for a number of solar thermal plants to be deployed in regional centres. Renewable Energy Zones will be created in areas with high quality renewable resources where access to state land is facilitated, planning processes are streamlined and incentives are developed to attract renewable energy proponents.

The Plan will be finalised and implemented through the Office of Clean Energy—a ‘one stop shop’ that will provide ongoing policy and program support while dispensing expertise to assist renewable energy developers fast track projects.

Initiatives will be progressed based on their ability to leverage Commonwealth and private sector funding and the extent of community and industry support.

2.1 Summary of initiatives

<p>Accelerating deployment</p>	<ol style="list-style-type: none"> 1. Queensland: The Solar Hot Water State—a Solar Hot Water Program to accelerate the installation of up to 200,000 solar hot water systems over three years 2. Solar Thermal Options for Regional Queensland: <ol style="list-style-type: none"> a) Multiple small-scale solar thermal plants—encourage the creation of consortia to deploy multiple solar thermal plants (of between 5-20 megawatts) throughout regional Queensland b) Large-scale solar thermal feasibility study 3. Queensland’s hot dry rocks—investigate commencing a pilot geothermal project by 2014 4. Small-scale renewable energy systems for Queensland’s Isolated Networks 5. Government Owned Generators partnering with industry to identify renewable energy solutions 6. Clean Energy Communities—increase opportunities for distributed electricity generation in Queensland’s growth hot spots
<p>Efficient and effective regulation</p>	<ol style="list-style-type: none"> 7. Regulatory Reform Package—best practice regulation for renewable energy in Queensland 8. Agricultural lease holders able to sublease to wind farms and other renewable energy technologies
<p>Smart industry, jobs and investment</p>	<ol style="list-style-type: none"> 9. Resource Mapping—map areas of strategic importance to Queensland including solar, wind and geothermal 10. Designate renewable energy as a Queensland Priority Industry Sector—Renewable Energy Industry Development Plan, including: <ol style="list-style-type: none"> a) The Renewable Energy Jobs Policy—up to 3,500 jobs by 2020 b) The creation of pilot Renewable Energy Priority Zones c) Renewable Energy Incentives Package d) Renewable Energy Technology and Innovation Program



Context:

Why renewable energy for Queensland

Queensland is the fastest growing and most energy intensive state in Australia. More harmful greenhouse gases are produced per person in Queensland than any other state with approximately 43 tonnes of greenhouse gas emissions per capita. With strong growth in electricity demand predicted (consumption will grow from 44,500 gigawatt hours to 69,000 gigawatt hours by 2020), Queensland faces the challenge of mitigating growth in greenhouse gas emissions while ensuring access to competitively priced energy. Queensland also faces unique challenges as a result of its vast geographic area and highly decentralised population, particularly in regard to ensuring cost-effective and reliable supply of electricity to remote and sparsely populated regions. Renewable energy will play a key role in addressing all of these challenges.



Why we need it...

Climate change mitigation

Renewable energy has low or nil greenhouse gas emissions which contributes to environmental quality and reduced economy wide greenhouse gas emissions, while providing a means for energy investors to manage long term carbon risk.

Regional and rural economic development and employment

Most of Queensland's quality renewable energy resources are located outside of major population centres. Renewable energy generation projects will positively stimulate regional economies as a result of new investment and the provision of direct and indirect infrastructure and service delivery.

What is renewable energy?

Renewable energy is a clean energy source that can be replenished naturally and used to produce electricity with minimal or nil greenhouse gas emissions. It includes energy generation from sources such as the sun, wind, biomass, hydro and heat from beneath the earth's surface.

Why we need it...

Sustainable industries and jobs

The expansion of the renewable energy sector and the transition to a green economy will drive productivity and economic growth which means new jobs and new investment.

Technology development

Renewable energy technology will be a fundamental component of industry's climate change response. A critical mass of research and development expertise in Queensland will create new investment opportunities and develop knowledge based export markets.

Reducing the strain on the state's electricity networks

In densely populated urban areas renewable energy can reduce the need for costly upgrades to electricity transmission and distribution networks by alleviating demand on these networks. As a form of distributed energy, it can also supply power to remote areas where access to the grid is not physically or economically feasible. In isolated parts of the state, the cost of fuel for generation of electricity can be as high as \$450 per megawatt hour. For these isolated networks, renewable energy could be a cost competitive alternative to traditional, fossil fuel-based energy sources. A diversified electricity generation fleet will provide security and reliability for the state's energy consumers.

3.1 Why now—the national drivers for change

The threat of climate change has mobilised Australian and state governments to develop and implement a range of clean energy policy responses.



Australian initiatives include:

- the expanded national Renewable Energy Target which stimulates direct investment in renewable energy and will require 20 per cent of electricity (an additional 45,000 gigawatt hours) to be sourced from renewable energy in Australia by 2020
- the Carbon Pollution Reduction Scheme which will create a price signal for carbon and will reduce greenhouse gas emissions by between 5 and 25 per cent by 2020. A price on carbon will make energy from fossil fuels increasingly more costly, thereby increasing the economic feasibility of a range of low emission technologies such as renewable energy.

The national Renewable Energy Target will be a key investment driver for Queensland, providing significant financial incentives for renewable energy development in the state. The sale of Renewable Energy Certificates through the Renewable Energy Target will ensure that in the short term, Queensland will continue to develop and deploy a range of more mature, low-cost renewable energy technologies (such as bagasse, wind and hydro).

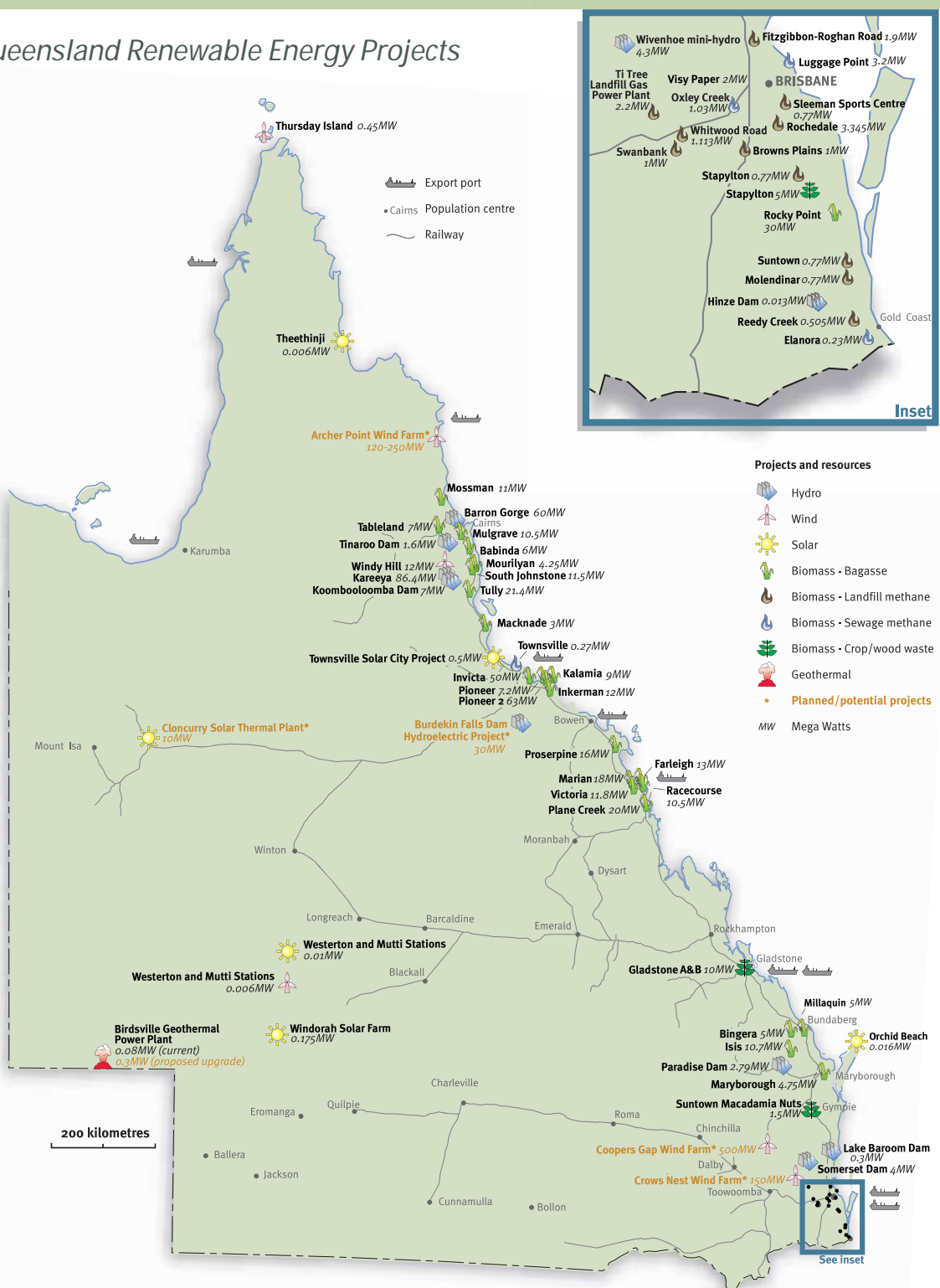
Modelling indicates that the national Renewable Energy Target could stimulate up to \$12 billion of investment by 2020 and that this will be sufficient to support both existing and emerging renewable energy technologies. This means emerging technologies with strategic significance for the state such as geothermal and large-scale solar thermal could receive support and be deployed on a significant scale beyond 2015. It is vital that Queensland maximises its share of the Renewable Energy Target while minimising its exposure to the Carbon Pollution Reduction Scheme by diversifying the state's electricity infrastructure with low emission technology such as renewable energy.

The Australian Government has also recently announced, as part of its Climate Change Strategy, a \$4.5 billion Clean Energy Initiative. This includes \$1.6 billion for large-scale solar power stations and \$465 million for Renewables Australia which will promote the development, commercialisation and deployment of renewable technologies. Leveraging from this funding will be critical in achieving the Australian Government's vision for the sector. The Office of Clean Energy will assist industry proponents form constructive partnerships to access this funding.

Queensland's current renewable energy capacity

In 2008, renewable energy accounted for approximately 6 per cent or almost 750 megawatts of Queensland's total installed generating capacity of more than 12,500 megawatts (including solar hot water systems). Biomass co-generation (primarily from bagasse) is the major renewable energy source in Queensland and provides 415 megawatts of the state's renewable energy capacity. Hydroelectricity provides 169 megawatts and solar hot water systems around 144 megawatts. Wind, solar photovoltaic and geothermal sources provide only small amounts of electricity.

Queensland Renewable Energy Projects



Biomass

Biomass is any type of plant or organic matter which can be incinerated and used as an energy source to produce electricity. Biomass co-generation (primarily from bagasse—sugar cane waste) is the major renewable energy source in Queensland and provides 415 megawatts of the state's renewable energy capacity.

Twenty-four sugar mills located from the south of Brisbane to the north of Cairns generate electricity from bagasse, and this accounts for more than half of Queensland's renewable energy generation. Bagasse-fired renewable energy generation has significant potential for further expansion in Queensland.

Biogas from landfill is produced by the decomposition of landfill waste, which consists of methane and carbon dioxide. There are a number of landfill gas operators in Queensland with a combined capacity of more than 30 megawatts.

Hydroelectricity

Hydroelectric energy is a mature renewable energy source that generates electricity by utilising water flowing by gravity to drive turbines. It has the ability to provide both base-load and peak generation to the electricity network. Hydroelectricity currently provides 169 megawatts of Queensland's renewable electricity generation, at locations across the state, including over 90 megawatts at the Kareeya Hydro and Koombooloomba Hydro installations located west of Tully in Far North Queensland.

Solar technologies

A range of solar technologies will play a part in increasing renewable energy generation capacity in Queensland. These will include solar hot water systems, solar photovoltaics and solar thermal technology. The Queensland Government is already investing in a variety of trials and pilot projects to prove these technologies. Solar thermal systems use the sun's heat to generate electricity, usually by heating fluid such as water and using it to drive a turbine, whereas photovoltaics are a semiconductor-based technology that convert the sun's light energy directly into an electrical current. These technologies are experiencing unprecedented global growth—solar thermal is being deployed on a large-scale to provide base-load capacity, while photovoltaics are being used worldwide to generate domestic energy supplies in both stand-alone and grid-connected applications.



Solar technologies (continued)

Australia's newest solar farm, an installation of concentrating photovoltaics, is now delivering solar energy to Windorah in Western Queensland, with the Government Owned Corporation, Ergon Energy contributing \$4 million in funding towards this project.

The Queensland Government has committed \$5 million to support Ergon Energy's Townsville-based Solar Cities Project. The Solar Cities Project is expected to generate 11 gigawatt hours of renewable energy electricity by 2013 and reduce greenhouse gas emissions by over 500,000 tonnes.

The Queensland Government has signed a Memorandum of Understanding with the Clinton Climate Initiative of the William J. Clinton Foundation (Clinton Foundation) for cooperation in undertaking a pre-feasibility study into the potential for establishing a concentrated solar thermal park in Queensland.

Geothermal technologies

Geothermal generation uses thermal energy from under the surface of the earth to generate electricity. There are two main sources of geothermal energy: wet geothermal, where bores are drilled into naturally occurring high temperature aquifers, to generate energy; and, hot dry rocks, where water is pumped underground to high heat producing granites, then the heat energy extracted is converted into electricity. Queensland has significant geothermal resources which could potentially provide large-scale emission-free electricity generation in the future.

Queensland has Australia's only operational geothermal plant. The Birdsville Geothermal Power Station, owned and operated by Ergon Energy, uses wet geothermal energy to generate 80 kilowatts of electricity for the town of Birdsville, providing around a quarter of the town's electricity requirements.

Wind

Wind electricity is one of the most technically advanced sources of renewable energy. AGL has recently bought the development rights for the proposed Coopers Gap Wind Farm, a \$1.2 billion project with up to 500 megawatts of capacity, or enough to supply approximately 320,000 households. AGL is also undertaking a feasibility study for a 150 megawatts wind farm at Crows Nest near Toowoomba.

Windy Hill Wind Farm, in the Atherton Tablelands, currently has 12 megawatts of capacity, or enough energy to supply 3,500 homes—equivalent to the towns of Atherton and Mareeba.

Ergon Energy also currently operates wind turbines on Thursday Island in the Torres Strait. These have a combined capacity of 450 kilowatts, which supply approximately 10 per cent of the Island's electricity.



Queensland Government action to date

High capital costs, technology impediments, regulatory barriers and the remote, dispersed location of some renewable resources have limited the sector's growth. This situation is changing however, with new and expanded Australian Government measures for renewable energy being complemented by strong policy statements in Queensland's *ClimateSmart 2050* and a Q2 Target to cut Queenslanders' carbon footprint by one third.

The Queensland Renewable Energy Plan builds on the existing strategies and policies currently employed by the government to diversify Queensland's stationary energy sector. Some of these initiatives include:

- the \$50 million Queensland Renewable Energy Fund (QREF) that supports the development and deployment of renewable energy generation technologies
- the \$15 million Queensland Geothermal Energy Centre of Excellence to drive geothermal research and technology
- the Solar Bonus Scheme, a feed-in tariff to pay domestic and small energy customers for the surplus electricity generated from roof-top solar systems
- the \$60 million Solar and Energy Efficiency Program for more than 1,250 Queensland State schools which includes the delivery of 2 kilowatts capacity solar photovoltaic panels, smart metering, IT systems and the installation of energy efficient lighting over the next three years
- Queensland Solar Homes Trial, a government bulk purchase of solar panels to drive down cost and increase uptake of solar panels
- up to \$5 million toward the \$30 million Townsville Solar Cities project which will fund grid-connected solar distributed generation.

In addition, the Queensland Government has invested in a number of renewable energy generation assets through the Government Owned Corporations including wind, solar thermal, hydro, biogas and Australia's first wet geothermal plant.

Cloncurry Solar Thermal Project

Cloncurry, in north-west Queensland, is set to become the first town in Queensland to produce solar thermal power capable of supplying all of the town's electricity needs, 24-hours a day. The technology used at Cloncurry will ensure the 10 megawatts power station will continue to generate electricity when the sun is not shining. Up to 8,000 mirrors will reflect sunlight onto graphite blocks. Water will be pumped through the blocks to generate steam that will operate a conventional steam turbine electricity generator. This project will determine if this clean energy solution can be replicated in other rural and remote areas of Queensland. The Queensland Government has committed up to \$7 million from the Queensland Renewable Energy Fund for the Cloncurry Solar Thermal Project.

Renewable energy—diversifying the Mackay Sugar Co-operative

In the face of low sugar prices, Mackay Sugar successfully applied for \$9 million from the Queensland Renewable Energy Fund to diversify into renewable energy production in the form of cogeneration and ethanol production. The cogeneration plant will provide 27 megawatts of renewable energy capacity to the Mackay district electricity grid for 50 weeks of the year, 30 per cent of the district's current usage and reduce greenhouse gas emissions by 200,000 tonnes per annum. At the same time it will provide steam and electricity for the sugar refinery and for ethanol production. The proposed 60 megalitre ethanol plant will derive all of its production steam and electricity from the cogeneration project, making it the 'greenest' ethanol produced in Australia. The project is significant in that unlike other bagasse cogeneration plants, it will be capable of supplying electricity in the crushing and non crushing season. During the non crushing season, the plant will be fuelled by stored bagasse.

Wind mapping

The Queensland Government has committed \$250,000 from the Queensland Renewable Energy Fund to purchase detailed wind mapping data for Queensland to inform local and regional planning. The map will identify the best high-wind areas, detailing their proximity to the power grid. It is anticipated that the provision of this type of data will make investment in wind power projects in Queensland more attractive to private sector investors.

Coastal Geothermal Energy Initiative

Queensland's known geothermal resources are a long distance from transmission lines and the major population centres on the east coast. The Coastal Geothermal Energy Initiative is a \$5 million drilling program that will build on existing geological data in Queensland. Its aim is to identify possible sources of hot rocks for geothermal energy closer to existing electricity transmission lines and population centres.

Birdsville Geothermal

The Queensland Government has committed \$4.3 million to Ergon Energy for the new Birdsville Geothermal Power Station. The project will replace existing plant that is reaching the end of its design life with more efficient equipment that will use the existing wet geothermal resources more efficiently, producing more energy from these resources.



The challenges ahead

Despite the potential of renewable energy, there remain challenges to developing these technologies.

High cost

Electricity generation from renewable energy sources in Australia is generally not as competitive as traditional electricity generation for large-scale grid connected demand. For example, according to ACIL Tasman modelling; the cost of new electricity generation from coal in Queensland can be as high as \$65 per megawatt hour¹. Based on modelling² commissioned by the Commonwealth, renewable energy sources range in price from \$80–\$90 per megawatt hour for wind and hydro and up to more than \$300 per megawatt hour for solar photovoltaic.

Renewable energy projects can have very high capital costs per unit of electricity generated, but lower ongoing operational expenditure, as they generally do not have fuel costs. To date, this has been insufficient to service capital expenditure, even over very long timeframes. The commencement of the Australian Government's Carbon Pollution Reduction Scheme (which will create a price signal for carbon), and the expansion of the national Renewable Energy Target (which stimulates direct investment in renewables) will narrow the cost gap between renewable sources and fossil fuel based energy sources.

Regulatory impediments

Industry participants have identified uncertainty around regulatory requirements as a barrier to the uptake of renewable energy in Queensland.

A lack of clarity on issues relating to land planning, land access, native title, royalty and fee regimes and environmental, noise and visual impacts, have the potential to hinder renewable energy developments. Regulatory issues regarding transmission and connection to the grid have also been identified as serious impediments.

Intermittency

The intermittent nature of some renewable energy sources and the corresponding fluctuations in electrical energy have in some cases limited the expansion of renewable energy, particularly given that the electricity grid must maintain an acceptable and predictable level of frequency and voltage variation.

1. ACIL Tasman (13 February 2009) *Fuel resource, new entry and generation costs in the NEM*, Prepared for the Inter-Regional Planning Committee.

2. MMA (2008) *Impacts of the Carbon Pollution Reduction Scheme on Australia's Electricity Markets—Report to Federal Treasury*.



Fluctuations can occur because:

- sugar is a seasonal crop and unless bagasse is stored for off-season use, generation is limited to the crushing season (i.e. June to January)
- wind intensity does not always meet the speed necessary for delivery of electricity at maximum efficiency (e.g. wind over seven metres per second)
- cloud cover and darkness limit solar generation.

Given that renewable energy sources cannot always provide a dependable electricity supply to the grid, alternative electricity infrastructure must still be built to ensure reliability for homes, business and industry.

The costs of servicing the capital for this duplicative infrastructure can in some situations add costs to the supply of electricity.

The capacity for integration of intermittent renewable energy sources into electricity grids will depend on the improvement of energy storage technologies which allow renewable power to be stored and released in a more controlled manner. However, substantial technological advances are already occurring and reliable, scalable storage devices are being developed. Intermittency issues are also being addressed by a greater distribution and diversity of renewable energy sources and the use of gas-fired plants to smooth peaks.

Other issues

Achieving the transition to a sustainable low carbon economy will require mobilisation of new skills and training. However, with the rapid expansion of the renewable sector globally, evidence of skills shortages are beginning to emerge.

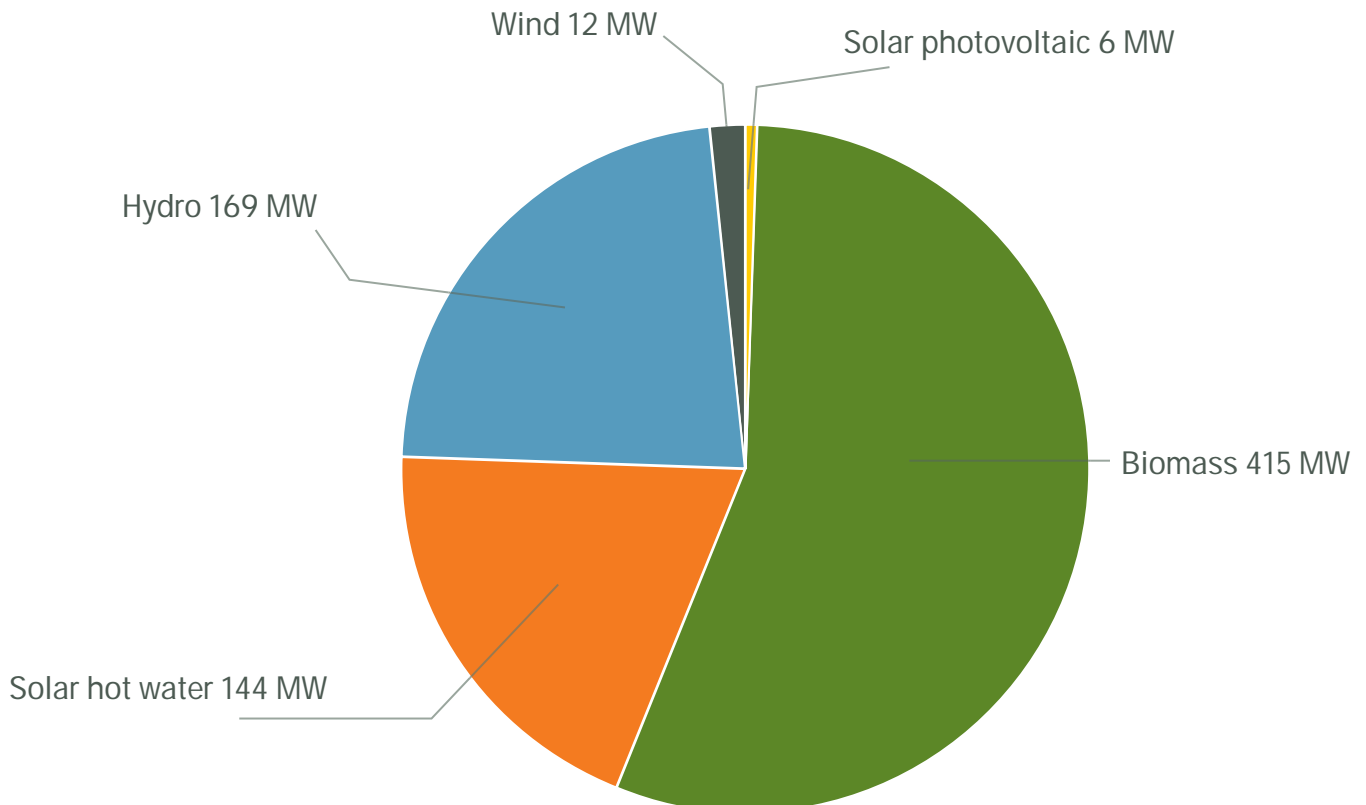
Technology will underpin advances in renewable energy and will be essential in helping lower costs while increasing efficacy of renewable energy solutions. The need for an increase in public and private funding for renewable energy research has been identified by industry proponents.

The vision — creating a clean energy future for Queensland

The Queensland Government's vision for the renewable energy sector encompasses new industry, new jobs and new investment. Aiming to achieve at least 20 per cent of investment generated through the national Renewable Energy Target, the Plan will help stimulate up to \$3.5 billion in new investment, create up to 3,500 jobs and reduce greenhouse gas emissions by more than 40 million tonnes.

Whilst the government's intent for the sector is ambitious, a bold vision is a necessary prerequisite to underpin the required regulatory, investment, incentive and stakeholder engagement frameworks that need to be in place for Queensland to demonstrate leadership in the renewable energy sector.

*2008 Renewable Energy Mix
Total: 745 megawatts (MW)*

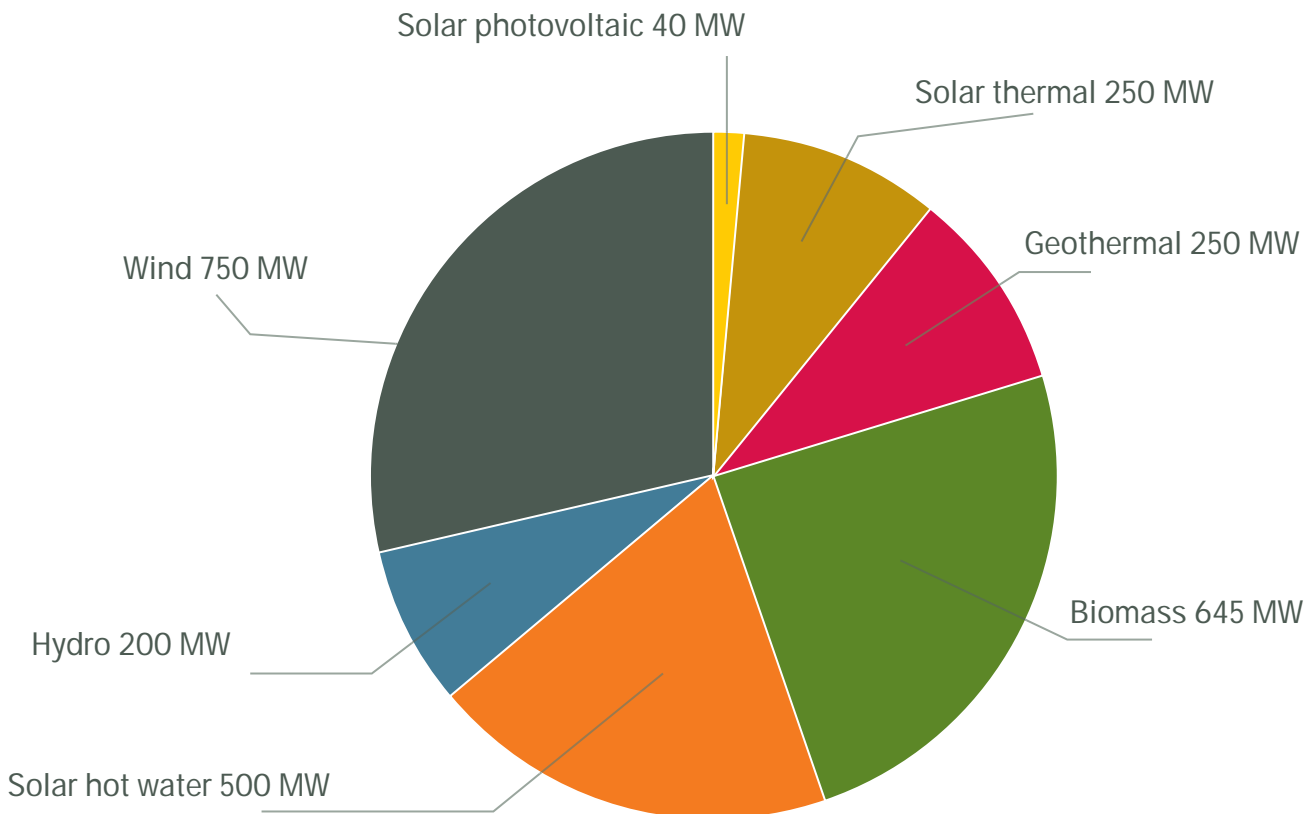


4.4 How we're going to get there

Should Queensland achieve a 20 per cent share of the national Renewable Energy Target, this would equate to 9,000 gigawatt hours (or more than 2,500 megawatts of capacity) of Queensland-based renewable energy by 2020.

The pie graph below represents a possible renewable energy profile for Queensland by 2020. The scenarios for each technology type and the approximate share of each renewable energy source for the state have been estimated using advice from industry, renewable energy proponents and national and international modelling.

*2020 Renewable Energy Mix
Total: 2635 megawatts (MW)*



The Queensland Renewable Energy Plan

The Plan will help leverage up \$3.5 billion in new investment, create up to 3,500 new jobs and reduce greenhouse gas emissions by more than 40 million tonnes by 2020.



5.1 Accelerating deployment

The primary objective of the Plan is to increase the deployment of renewable energy infrastructure in Queensland. This means providing the right incentives, financial and otherwise, to encourage industry to move beyond 'business as usual' and look for new opportunities to deploy renewable energy.

Initiatives

1. Queensland: the solar hot water state

The Queensland Solar Hot Water Program (the Program) will accelerate the installation of up to 200,000 solar hot water systems (including heat pumps) over a three-year period from 1 July 2009.

The Program aims to:

- reduce participating Queensland household electricity bills by approximately 20–30 per cent annually which could save up to \$100 million in total over the three-year life of the scheme and up to \$825 million state-wide over the life of the installed systems
- achieve a cumulative greenhouse gas emission reduction of 630,000 tonnes over the three year life of the scheme and more than 4.9 million tonnes over the life of the systems. This will help to achieve the Q2 aspiration to reduce Queenslanders' carbon footprint by one-third by 2020
- create up to 500 direct jobs in manufacturing and installation
- attract solar hot water manufacturing capacity to the state.

2. Solar thermal options for regional Queensland

2a. Multiple small-scale solar thermal plants

This initiative will encourage the creation of consortia to deploy multiple solar thermal plants (with individual capacity between 5 – 20 megawatts, subject to individual feasibility) throughout Queensland. Ergon Energy has identified a number of sites (including Charleville, St George and Emerald), where network augmentation will be required in the next few years. The initiative provides an opportunity to prove up the technology on a small-scale, deploy multiple solar arrays in strategic locations throughout the state, and minimise the cost to the Queensland Government through avoided network costs.

2b. Large-scale solar thermal feasibility study

Queensland has high quality solar resources located throughout the state. Concentrated solar power generation with appropriate storage technologies offers a potential mechanism to harness this energy for base-load power and a range of niche applications such as heat energy for mining and industrial processes.

The Queensland Government, in partnership with the Clinton Foundation and other stakeholders, will undertake a feasibility study to determine the economic, technical and environmental feasibility of deploying large-scale concentrated solar power at specific sites in Queensland. The first stage of this study is scheduled for completion in 2009.

3. *Queensland's hot dry rocks—investigate commencing a pilot geothermal project by 2014*

Geothermal energy, along with solar thermal, represents one of the best potential avenues for large-scale generation of clean energy in Queensland. Production legislation will be released in 2009 to help fast track geothermal projects. The government in partnership with industry will seek to commence deployment of a large-scale geothermal demonstration project by 2014.

4. *Renewable energy options for Queensland's isolated networks*

Small-scale renewable systems (flat plate solar photovoltaic) are currently being trialled on Thursday Island, Bamaga and Horne Island to determine the effectiveness of renewable energy options in helping isolated communities transition from diesel generation to reduced emissions intensive alternatives.

These systems will improve the quality and reliability of electricity supply and decrease diesel use, resulting in savings to government and ongoing reductions in greenhouse gas emissions. Contingent on the success of this pilot program and the effectiveness of a range of energy efficiency measures also being deployed, the program may be rolled out to all of Queensland's isolated communities.

5. *Government Owned Generators partnering with industry to identify renewable energy solutions*

Queensland energy sector Government Owned Corporations—Stanwell Energy, CS Energy, Tarong Energy, Ergon Energy, ENERGEX and Powerlink—have the potential to increase the uptake of renewable energy in Queensland. Queensland's Government Owned Corporation generators currently comprise around 55 per cent of Queensland's generating capacity but only around 28 per cent of Queensland's renewable energy capacity.

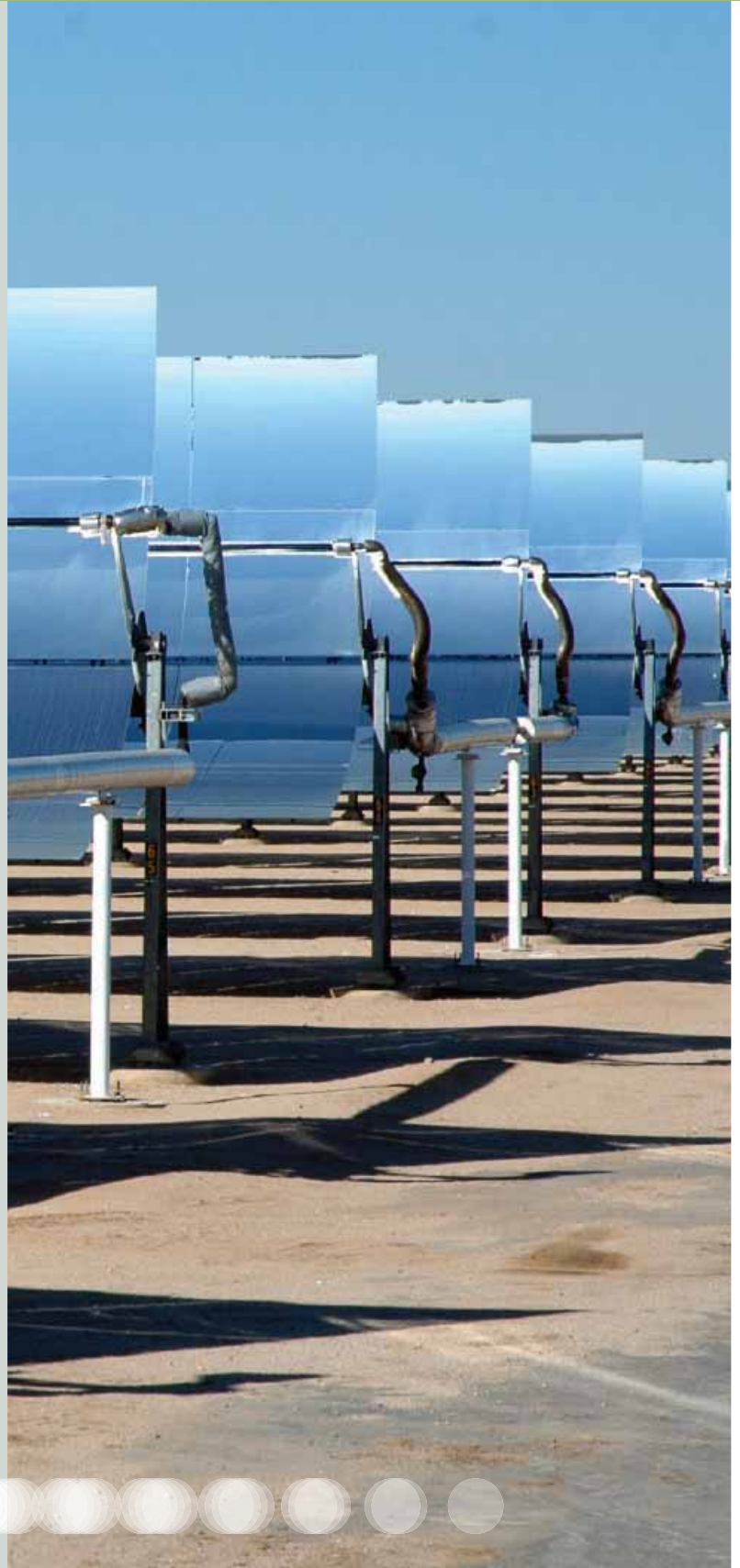
It is expected that Queensland's Government Owned Corporations will examine their operations to identify opportunities to work with industry to deploy renewable energy solutions. To achieve this outcome, the Office of Clean Energy will consult with relevant Government Owned Corporations to examine their approach to addressing the challenge (noting that investments and transactions entered into by Government Owned Corporations are undertaken based on the commercial merit of the proposal and the ability of the investment or transaction to contribute to the long term strategic objective).

As part of this initiative, Renewable Energy Network Benefit Statements will be required annually from Ergon, ENERGEX and Powerlink detailing where deployment of renewable energy or demand management projects may avoid building or upgrading networks into the future.

6. *Clean energy communities*

With Queensland's continuing population growth, options to reduce peak demand and decrease loads on the network are becoming increasingly important. Master planned communities capture a significant portion of population growth occurring in South-East Queensland. The proliferation of suburban and regional development also creates significant energy demand. These new and increasing demands mean increased costs to the state as a result of the need for continual network upgrades.

Developers and local government can play an active role in reducing energy demand and supporting the growth of distributed renewable energy sources in electricity networks. Accordingly the Office of Clean Energy will assist all new and refurbished master planned communities, large-scale commercial developments and government infrastructure services to develop Clean Energy Plans. These plans will encompass demand side management, energy conservation and renewable energy options aimed at speeding up the deployment of clean energy technologies in major population growth hot spots. This initiative will align with the Queensland Government's Green Door and Cleaner, Greener Buildings initiatives. Initially such an approach could be developed, trialled and refined within existing or proposed master planned communities such as Greater Springfield and Ripley Valley west of Brisbane or Rocky Springs in north Queensland. Demonstration projects in some developments could commence in 2010.



Efficient and effective regulation

5.2

A lack of industry clarity on issues relating to land planning, native title, land tenure and environmental, noise and visual impacts has the potential to hinder renewable energy developments in Queensland. In addition, regulatory issues regarding transmission and connection to the grid have been identified as serious impediments. As many of these network issues are regulated through the National Electricity Rules, Queensland will position itself to take a leadership role to influence the continued development of the national regulatory framework.



Initiatives

7. *Best practice renewable energy regulation for Queensland*

A regulatory reform package will be delivered in 2009, aimed at simplifying the business, regulatory and planning environment in Queensland for renewable energy projects. A Renewable Energy Regulatory Taskforce will examine existing legislation and provide options to remove or reduce impediments and streamline planning processes for renewable energy projects. For example, the project will examine the best mechanisms for facilitating access to land for renewable energy, which may include acquisitions, land designations or declaration of State Development Areas.

Development in Queensland is subject to various regulatory requirements, instruments and plans that are administered by all levels of government. Approvals may be required under Commonwealth legislation such as the *Environment Protection and Biodiversity Conservation Act 1999* for renewable energy projects. Relevant state legislation that imposes requirements for development includes the *Integrated Planning Act 1997*, *Environmental Protection Act 1994*, *State Development and Public Works Organisation Act 1971* and the *Electricity Act 1994*. Each local government's planning scheme may also establish requirements for development in that local government area.

This plethora of regulation can hinder renewable energy projects. Providing some clarity, or mapping, of these frameworks will be an important first step in identifying options for streamlining of regulatory requirements. Developing industry-specific planning tools and streamlined processes for approvals will further accelerate investment in the sector.

A key component of this project will involve examining transmission and distribution issues, specifically regulatory, technical and financial impediments to connect to the network and options to build network infrastructure to areas with quality renewable energy resources. This work will be developed in consultation with Powerlink, Ergon Energy, ENERGEX and industry, and will include a framework aimed at assisting project proponents connect to the network.

8. *Agricultural lease holders able to sublease to wind farms and other renewable energy technologies*

Seventy-one per cent of Queensland is classified as State land, presenting an opportunity for government to provide preferential access arrangements for renewable energy projects. Most State land is administered under the *Land Act 1994* by the Department of Environment and Resource Management. Under the current Land Act provisions, a lease must be used for the purpose for which it was issued. By amending the Act, a leaseholder could have improved flexibility to accommodate green energy projects with their consent. Lease holders could then benefit through an additional income stream to support the primary land use.



Smart industry, jobs and investment

The renewable energy industry and support services are growing exponentially. The United Nations estimated that \$148 billion was invested in new wind, solar and other alternative energy assets in 2007. This represents a 60 per cent increase over 2006. The Queensland Government must position itself to capture a share of this investment by developing new jobs, products, markets and services.

Initiatives

9. Resource mapping

Queensland's wind and solar resources will be mapped and the first series made publicly available by the end of 2009 with the purpose of attracting increased investment from renewable energy proponents. The maps will be designed to provide information to industry on the best sites in Queensland for building renewable energy generation projects. It will allow them to easily evaluate potential sites based on the amount of energy resource available and proximity to existing electricity networks and water sources. Geothermal mapping will commence by July 2009.

10. Designate renewable energy as a Queensland priority industry sector

The Queensland Government establishes priority industry sectors where government action can achieve the largest gains in developing industries. Priority sectors have Industry Development Plans that drive productivity and economic growth by: connecting industry with ideas; boosting incentives for productivity improvement; developing skilled people; building markets for smart products; and promoting an innovative business culture.

A number of initiatives will be developed as part of the Industry Development Plan including:



10a. The Renewable Energy Jobs Policy—up to 3,500 jobs by 2020

The policy will include an education, training and skill-building framework to ensure that appropriate skills are developed in Queensland to support the rapid expansion of the sector. The policy will not duplicate existing Queensland and Australian programs but will strengthen coordination of employment and training development across Queensland Government agencies including measures to adapt curricula, provide information and incentives to industry and individuals to re-skill workforces and training support for the emerging renewable energy industry.

10b. Pilot Renewable Energy Zones

Building on the resource mapping project, Renewable Energy Zones (REZs) will be designated in areas where there is the best quality renewable energy resource, the greatest potential for network availability and energy demand growth. Development of the REZs will include specific proposals to facilitate common user infrastructure such as transmission and distribution, provision of land, investment incentives and streamlined regulatory and approval processes. Initially three pilot REZs will be designated in areas near Mount Isa, in the Surat Basin and Central Queensland.

10c. Renewable Energy Incentives Package

A suite of incentives will be developed as part of the Industry Development Plan to attract renewable energy generators to the state, particularly to the designated Renewable Energy Zones. The incentives package could include: the establishment of technology-specific feed-in tariffs, preferential access to state-owned land, training and recruitment costs and the provision of common use infrastructure.

Many of these incentives are currently offered under the Queensland Government's Regional Queensland Investment Incentives Scheme which provides financial incentives to influence the investment decisions of businesses considering whether to locate a strategic project in regional Queensland. This scheme is managed by Invest Queensland, and the Office of Clean Energy will work with them to further develop a renewable energy specific incentive package. Options for incentives will be considered by the Queensland Government in late 2009.

10d. Applying technology and innovation

Technology is fundamental to industry's climate change response and the government is committed to developing a strategic approach to the development of the low emission technology sector. Existing renewable energy research and development in Queensland is disparate and undertaken by a wide cross-section of organisations. The extent of collaboration between participants and the development of critical mass in specific areas of research is unknown. Similarly, public funding originates from multiple agencies within the Queensland Government. Industry has expressed concern that research and development performance will not be optimal without a cohesive approach.

Funding from Queensland Government innovation funds may be used to help develop Queensland-based renewable energy technology solutions. A key focus of this initiative will be the commercialisation of proof-of-concept technologies such as solar thermal and geothermal to ensure their economic viability within the next five to ten years.

The Office of Clean Energy, in conjunction with other divisions of the Department of Employment, Economic Development and Innovation, will also examine opportunities to address areas of market failure along the innovation chain, facilitate strategic prioritisation of resources and increase collaboration and strategic alliances.





Implementation

The Office of Clean Energy

In late 2008, the Premier established the Office of Clean Energy to further develop and implement the state's clean energy policy. The Office of Clean Energy is a 'one stop shop' that will provide ongoing policy and program support while dispensing expertise to assist proponents fast track eligible projects. It will ensure integration of renewable energy, energy efficiency, and demand management related projects across the Queensland electricity network, while establishing a strong advocacy role for the clean energy sector in Queensland. The Office of Clean Energy will significantly improve the state's capacity to coordinate information across state, Commonwealth and local governments, industry groups and industry participants.



Review

The Queensland Renewable Energy Plan describes a comprehensive work plan for the Queensland Government to accelerate the development of the renewable energy sector. The policy's effectiveness will be assessed on an ongoing basis, in recognition of the rapidly changing global and national policy environment. Regular assessment will also ensure flexibility. A review of the Plan will be undertaken within two years.





Contact

**Office of Clean Energy
Department of Employment,
Economic Development and Innovation**

PO BOX 15216
City East, Queensland
4002

P: +61 7 3237 1508
E: info@cleanenergy.qld.gov.au