Department of **Employment, Economic Development and Innovation**

Queensland Energy Management Plan

May 2011

Queensland Government

Foreword

"Managing electricity usage in the face of a growing population is an issue currently at the core of our industry, and I encourage the Queensland Government to continue to improve on ways of dealing with that."

Malcolm Richards CEO,
Master Electricians Australia

Queensland's strong economy and continued population growth is ensuring that electricity demand continues to grow.

These rising network and generation costs affect consumers through higher electricity prices.

The Queensland Government understands that times are tough under rising cost of living pressures like electricity and we are doing all we can to ease the burden on Queenslanders.

The Queensland Energy Management Plan (QEMP) sets out how we intend to manage the twin challenges of peak demand driven by economic growth and a secure, reliable energy supply.

The Plan is a roadmap to help manage electricity growth in a more cost effective manner by implementing a range of new initiatives that will engage electricity customers, distributors and the broader community.

By 2020, successful implementation of the QEMP will help avoid the equivalent of 1000 megawatts (MW) of necessary electricity generation and network infrastructure, saving the state more than $3.5 billion.

A key focus of the QEMP is to ease upward pressure on electricity prices by slowing the current trend of rapid growth in electricity use and peak demand.

To do that customers are encouraged to use energy more efficiently in homes, buildings and businesses.

The Plan outlines 28 initiatives designed to manage electricity consumption and peak demand in a more cost effective way, initiatives that will have considerable impact on the State's electricity network over the coming years.

The Queensland Energy Management Plan complements *Towards Q2, Tomorrow's Queensland* which underlines the State Government's commitment to cutting Queenslanders' carbon footprint by one third by 2020.

Reducing electricity use through energy efficiency and energy conservation will be critical to meeting this target.

The initiatives outlined in the QEMP complement the existing efforts to promote renewable energy generation outlined in it's sister document, the *Queensland Renewable Energy Plan*.

The Queensland Government recognises electricity pricing and management of peak demand are challenges in a rapidly growing State.

With this Plan we continue our efforts to rise to that challenge.

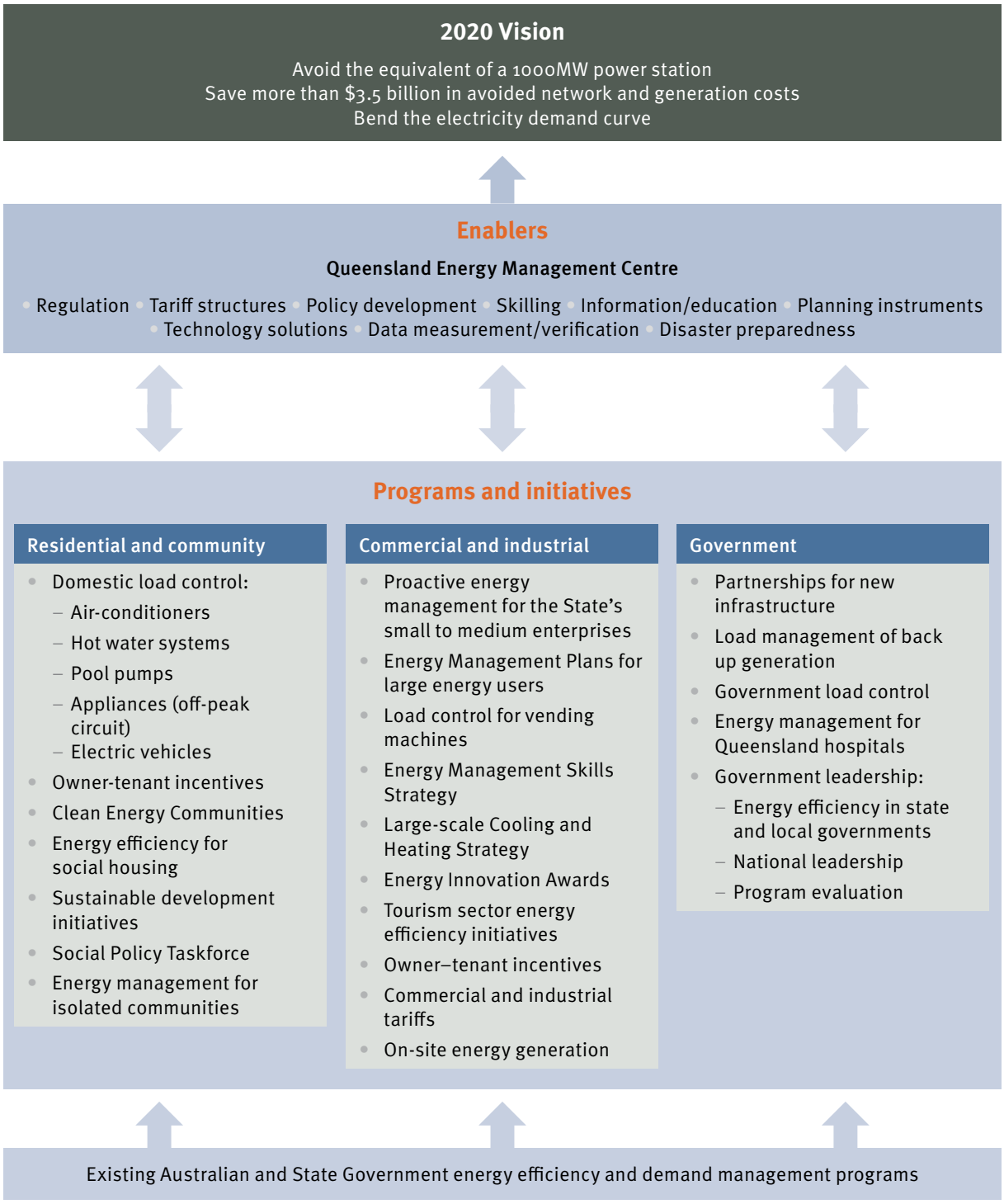
Anna Bligh, MP

Premier and
Minister for Reconstruction

Stephen Robertson, MP

Minister for Energy
and Water Utilities

Overview of the Queensland Energy Management Plan



1 Executive summary

Queensland's strong economy and continued population growth will ensure electricity demand continues to grow.

To meet this growth, peak demand capacity is expected to increase from approximately 8300 MW in 2008/09 to more than 12 800 MW by 2020. Over the next 10 years, it has been projected that more than $15 billion in capital infrastructure will be required for business-as-usual electricity delivery through traditional means.

Delivery of the State's clean energy agenda is a significant challenge given that energy consumption is integrally linked to growth, prosperity, productivity and quality of life. The Queensland Energy Management Plan (QEMP) is a roadmap to help manage electricity growth in a more cost effective manner by implementing a range of new initiatives underpinned by a broad regulatory reform process that will engage electricity customers, distributors and the broader community. A key focus of the QEMP is to mitigate upward pressure on electricity prices by slowing the current trend of rapid growth in electricity use and peak demand.

By 2020, successful implementation of the QEMP will help avoid the equivalent of 1000 MW, saving more than $3.5 billion in avoided network and generation costs. It will also assist Queensland households, businesses and industry respond to the energy challenges of the future—including emissions reduction and management of peak demand—through energy efficiency, energy conservation and demand management.

Fundamental to the successful delivery of the Queensland Government's vision is the implementation of a broad regulatory reform program. Direct load control of high use energy appliances such as hot water systems, air-conditioners and pool pumps, targeted demand reduction for commercial and industrial users and tariff review will help ensure efficient and responsible use of energy.

The QEMP will also deliver specific initiatives that will drive efficiencies in existing programs, establish appropriate measurement and verification, provide opportunities for Government collaboration and leadership. It will help examine and improve infrastructure planning guidelines and ensure the energy conservation agenda is represented in network asset planning and development.

Ultimately, the QEMP aims to transform Queensland's electricity network into an integrated, dynamic and responsive network. This will enable proactive management of electricity demand and consumption that will help bend the electricity demand curve delivering substantial economic, social and environmental benefits to all Queenslanders. The QEMP is designed to complement the *Queensland Renewable Energy Plan*, which broadly promotes energy management themes as part of the wider deployment of renewable energy throughout the State.

The initiatives described in the Plan will be further developed and implemented through an Australian first, the Queensland Energy Management Centre. The State's electricity distributors ENERGEX and Ergon Energy will be key partners in delivering the Plan and providing direction for the virtual Queensland Energy Management Centre.

2 Context

2.1 Energy concepts—demand management and energy efficiency

The challenge for the Queensland Government is to reduce the growth rate of both the consumption of electricity and peak electricity demand—demand management and energy efficiency represent two of the most cost-effective methods to achieve this.

a) *Peak demand management*

Peak demand refers to the times when maximum electricity is drawn from the network. In Queensland, peak demand generally occurs between 4pm and 8pm, when most householders return home and turn on energy intensive appliances. Hot summer days can cause significant spikes in demand due to the wide-spread use of air-conditioning. The transmission and distribution networks must be large enough to cope with both the average daily electrical load and those major spikes in demand that normally occur for only a few hours on a few days of the year.

Approximately 10 per cent of Queensland's multi-billion electricity network has been built to deliver energy for the extreme peak loads that occur for less than one per cent of the time (i.e. less than 88 hours per year). Hundreds of millions of dollars are spent each year to build and maintain this network, much of which is idle for all but the hottest summer days. Historically, the response to projected increases in peak demand has been to continually expand the network.

Demand management is the reduction in electricity use by customers at peak times and is measured in MW. The simplest examples of demand management include switching domestic hot water systems to off-peak tariffs or load switching where commercial customers defer energy intensive activities outside of peak times. These activities may not reduce the total energy used; instead they flatten the peak and therefore reduce the need for new infrastructure.

As peak demand management may shift rather than reduce total energy use, its benefits are primarily economic through deferred infrastructure costs. Environmental benefits such as reduced pollution and greenhouse gas emissions are gained from reducing total energy use, rather than just the peak. Total energy use can be reduced through energy efficiency and energy conservation.

b) *Energy efficiency*

Where demand management addresses peak energy use (by shifting load or peak reduction), energy efficiency reduces total energy use. Energy efficiency measures are those that achieve the same outcome while using less energy (for example, lighting a room with energy efficient bulbs). Energy efficiency is considered the most cost effective method of reducing greenhouse gas emissions and electricity bills. In many instances, energy efficiency measures effectively pay for themselves.

c) *Energy conservation*

Energy conservation is reducing total energy by switching off unnecessary equipment, including appliances on standby mode. As customers pay for what they use, energy conservation is the easiest way for a customer to reduce their overall energy costs. Energy conservation is achieved primarily through behavioural change, so the main avenue for government intervention is through the delivery of education campaigns and marketing.

2.2

Challenges in implementing the energy management agenda

There are a number of challenges to the deployment of energy efficiency and peak demand initiatives.

- Information barriers—where action is not taken due to lack of information on potential benefits or opportunities.
- Capital constraints—particularly for low income households, where significant up-front capital costs are difficult to justify even when aware of the potential ongoing savings.
- Split incentives—where the party that must pay for improvements will not directly benefit from the ongoing energy savings (e.g. landlord and tenant).
- Skills and capacity—where skills shortages may limit the availability of suitable staff to identify or implement opportunities.
- Disincentive for retailers to encourage energy conservation—where profits are directly linked to the amount of energy sold.
- Regulatory barriers—where existing regulations may perversely favour inefficient solutions.

The relative significance of these barriers is expected to change over time. The increase in costs resulting from the introduction of market based mechanisms such as the national Renewable Energy Target and any price on carbon will increase the percentage of business and household budgets dedicated to energy, ensuring a higher relative priority. An increase in energy costs shortens payback periods, because of larger savings, strengthening the business case for improvements and reducing the relative importance of up-front capital costs.

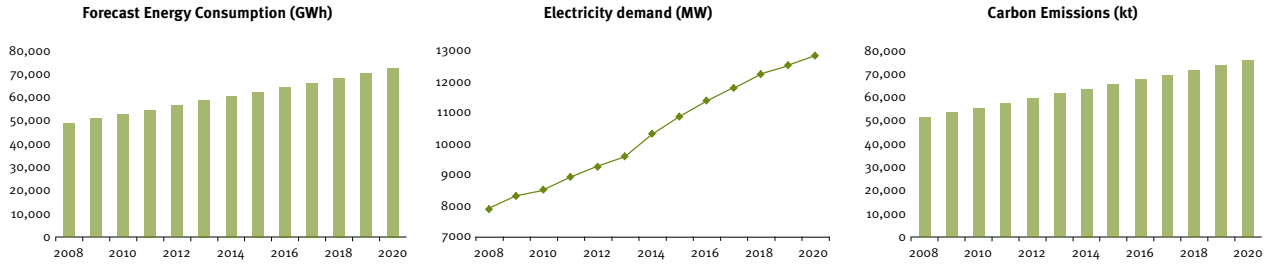
Energy efficiency is considered the most cost effective method of reducing greenhouse gas emissions and electricity bills. In many instances, energy efficiency measures effectively pay for themselves.

2.3

Why we need to act

Queensland's electricity demand will continue to grow at more than 3.5 per cent per year. By 2020, peak demand in Queensland is expected to grow to more than 12 800 MW (from approximately 8300 MW in 2008/09).

Figure 1 – Projected electricity demand, consumption and greenhouse gas emissions



To meet this growth in demand, it is projected that more than $15 billion in capital infrastructure will be required for business-as-usual electricity delivery through traditional means by 2020. ENERGEX estimates that the average investment for each megawatt of additional capacity is $3.5 million (comprising $2 million distribution network assets, $0.7 million transmission asset network costs and $0.8 million generation costs). As this cost is shared by customers, traditional approaches to meeting demand must be re-evaluated.

A significant driver contributing to the increasing cost of electricity is the expectation by customers that the distribution network will meet demand at all times. This expectation is increasing network costs while concurrently driving a decline in the utilisation of network assets. Network utilisation is falling as a consequence of customers demanding larger assets to support their lifestyle in circumstances where these assets are used for the equivalent of a few days or hours each year, during extreme climatic events.

It is projected that more than $15 billion in capital infrastructure will be required for business-as-usual electricity delivery through traditional means by 2020.

The cost of this network expansion is ultimately met by electricity customers—residential, commercial and industrial. In Queensland, the most significant impact on domestic consumer's electricity bills is not increasing energy generation costs but increasing network infrastructure costs. Based on current trends, the percentage of network costs of a residential customer's electricity bill could exceed 60 per cent by 2020.

Another significant challenge for Queensland from an energy conservation perspective is limiting greenhouse gas emissions by reducing electricity consumption and encouraging the increased penetration of renewable energy generation. The stationary energy sector is widely acknowledged as a significant contributor to greenhouse gas emissions. The Queensland Government's *ClimateSmart 2050 – Queensland Climate Change Strategy* highlighted that maintaining a business-as-usual model will result in greenhouse gas emissions from the electricity sector reaching 78 million tonnes by 2030, or around 200 per cent of 2000 emissions levels.

Whilst demand management outcomes have primarily an economic focus, energy efficiency provides low cost opportunities to decrease the State's carbon footprint. However, it is acknowledged that there is already a substantial policy focus at both the State and Federal levels on key elements of the energy challenge. The initiatives outlined in the QEMP are designed to complement, not duplicate, existing energy efficiency schemes.

2.4

Queensland Government action to date

Historically, Queensland has been a leader in its approach to managing electricity demand. More than one million of the 1.8 million households in Queensland are connected to off-peak hot water tariffs, in what is one of the largest and longest running residential load management programs in the world. In South East Queensland alone, these tariffs are estimated to reduce winter peak demand by 450 MW, the equivalent of a small coal-fired power station.

More recently, through *Towards Q2, Tomorrow's Queensland*, the Queensland Government has committed to cutting Queenslanders' carbon footprints by one third by 2020. Reducing electricity use through energy efficiency and energy conservation will be key to meeting this target.

The $44.7 million Energy Conservation and Demand Management Program alone is expected to reduce peak demand by 40 MW, or an expected saving of $120 million in transmission, distribution and generation infrastructure.

In 2009 the Queensland Government released its strategy for combating climate change *ClimateQ; towards a greener Queensland*. The strategy presents a broad range of investments and policies outlining Queensland's climate change response. In addition to initiatives relating to transport, land use and adaptation, the strategy outlines a variety of initiatives relating to energy management, including:

- the $44.7 million Energy Conservation and Demand Management Program, to work with electricity distributors to deliver a package of demand management strategies
- a $5 million package of initiatives for remote communities that will introduce energy efficiency measures in conjunction with the replacement of diesel generation by renewables
- $5 million towards the Townsville: Queensland Solar City project which involves installing solar panels and smart meters, as well as implementing other energy saving initiatives on Magnetic Island
- $1.4 million towards the development of sustainable building skills through the Green Building Skills Fund
- increased energy performance standards for new government buildings, and $8 million towards retrofitting existing government buildings through the Energy Efficiency Retrofit Program, administered by the Department of Public Works
- $200 000 for the Facilitating Low Emission Energy Generation in Commercial Buildings initiative to encourage distributed generation in the commercial sector
- working with local councils on energy efficient infrastructure through the Climate Ready Infrastructure Grants
- $15 million towards the ClimateSmart Business Service, to assist businesses to reduce their greenhouse emissions in preparation for increased energy costs
- $450 000 towards the Cleaner Greener Buildings initiative, lifting environmental standards for all new homes, offices and government buildings
- regulation to support demand management activities.

These initiatives are expected to have considerable impact on the electricity network over the coming years. The $44.7 million Energy Conservation and Demand Management Program alone is expected to reduce peak demand by 40 MW, or an expected saving of $120 million in transmission, distribution and generation infrastructure.

The *ClimateQ* package complements an existing suite of Queensland government energy management initiatives, including:

- supporting businesses to adapt to an energy efficient, low carbon economy through programs such as ecoBiz, ClimateSmart Business Clusters and QWESTNet
- requiring Queensland's largest commercial energy users to identify potential energy savings through the Smart Energy Savings Program
- helping consumers make informed choices on energy efficient appliances through ClimateSmart Retail
- encouraging a low carbon lifestyle with the ClimateSmart Living program
- helping householders save on their energy bills through the ClimateSmart Home Service.

2.5

The National Energy Management Agenda

In Australia over the past five years the National Framework for Energy Efficiency (NFEE) has been the primary mechanism for developing and implementing energy efficiency policies collaboratively between Commonwealth, state and territory governments.

The Queensland Government has taken a leadership role in this forum with an investment of almost $5 million over five years and is integral in helping achieve a national economic benefit of $2.65 billion and greenhouse gas abatement of 15.8 million tonnes by 2020. These savings have been achieved by incorporating energy efficiency improvements mainly in appliances, buildings and major industry.

The Queensland Government has taken a leadership role with an investment of almost $5 million over five years.

On 2 July 2009, the Council of Australian Governments (COAG) agreed to a comprehensive 10 year National Strategy on Energy Efficiency (NSEE) to accelerate energy efficiency improvements for households and businesses across all sectors of the economy. The Queensland Government is an active participant in the development of the NSEE and will ensure that the implementation of the QEMP is informed by national processes.

Case study

The powersavvy program

There are 33 isolated power stations that provide electricity to customers in isolated areas of Queensland.

These networks rely almost entirely on diesel fuel for electricity generation. The cost of providing a reliable, high quality supply of electricity in these communities is very high.

In 2009, the Queensland Government provided Ergon Energy with $5 million to implement the Isolated Communities Energy Savings Pilot (now known as "powersavvy") at Thursday Island, Horn Island and the Northern Peninsula Area. The objective of the pilot was to develop and demonstrate a sustainable, repeatable model for significantly reducing electricity consumption in isolated communities, with a target for reduction in energy consumption of 20 per cent across the pilot communities. In parallel with the energy efficiency and energy conservation trials, $1.05 million is being spent installing 200 kilowatts of photovoltaic (PV) panels in the three pilot communities and Boulia, to assess the suitability of PV for these regions.

Ergon Energy has recruited and trained local indigenous field officers to undertake 950 residential audits. There has been a strong interest from the local indigenous community in participating in the audits, with over 600 conducted; the audits have seen a high uptake with most indigenous residents approached participating. Detailed energy saving audits have also been conducted with 140 large commercial and Government customers in these communities.

Early indications from the pilot are that participants have already achieved significant reductions in their power bills, with some residents advising savings of up to 30 per cent in their electricity bills.

3 The vision

The QEMP will help transform Queensland's electricity network into an integrated, dynamic and responsive network that will enable proactive management of electricity demand and consumption to bend the electricity demand curve.

By 2020, successful implementation of the QEMP will help avoid the equivalent of a 1000 MW power station and more than $3.5 billion in avoided network costs.

3.1

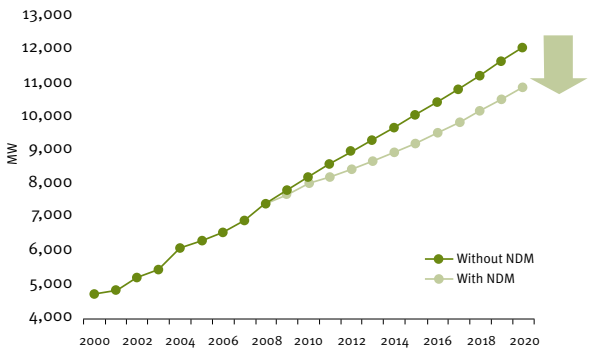
How we're going to get there–bending the demand curve

The QEMP proposes a roadmap to help manage electricity growth in a more cost effective manner. For every 1 MW of capacity avoided through the plan, $3.5 million in network and generation assets is avoided.

By developing and implementing a range of initiatives underpinned by a broad regulatory reform process, the QEMP aims to bend the electricity demand curve (Figure 2 below). Importantly the demand management activities and energy efficiency measures are designed to change the way electricity is used, with minimal impact on lifestyle or the effectiveness of appliances or services.

The demand management activities and energy efficiency measures are designed to change the way electricity is used.

Figure 2 – Bending the electricity demand curve



The QEMP comprises a range of initiatives that will be developed and implemented out to 2015, with a number of high value propositions considered as a priority. These include options to increase load control on hot water systems, pool pumps and air-conditioners, the development of targeted electrician training, a number of energy management opportunities in Government buildings and the establishment of appropriate measurement and verification mechanisms. Underpinning all the activities of the QEMP are a number of fundamental principles that focus on achieving widespread penetration of load control, provision of incentives to encourage uptake, improving access to information and education, addressing social disadvantage and providing Government leadership. The role of tariffs could also play an important part in changing behaviour.

Case study

Zillmere Joint Contact Centre

The Joint Contact Centre (JCC) in Zillmere, Brisbane, is a new government building designed to house a number of agencies and services. The building will provide continuous contact centre facilities for Smart Service Queensland and the Queensland Police Service, 24 hours a day, seven days a week.

In September 2009, the JCC was awarded a 6 Star Green Star–Office Design v2 rating from the Green Building Council of Australia (GBCA) with a score of 92 points. This is the highest score achieved by an office building to date in Australia and represents 'World Leadership' in sustainable design. In particular, the building received the highest possible points for the Energy, Management and Water benchmarks. The building is also registered with the GBCA to be assessed under the Green Star–Office As Built and Office Interiors ratings.

The Joint Contact Centre PV installation consists of 630 roof mounted PV panels and more than 1200 PV panels mounted above an external sealed car park. The PV installation will provide up to 450 kilowatts of installed solar energy capacity producing approximately 705 000 kilowatt hours of solar energy per annum. It is estimated that the PV installation will reduce greenhouse gas emissions by 734 tonnes each year and result in an annual energy cost reduction of approximately $147 000.

4 The Queensland Energy Management Plan

4.1 *The Queensland Energy Management Centre– driving delivery of the QEMP*

Successful implementation of the QEMP will require a coordinated approach. To this end, the Queensland Government, ENERGEX and Ergon Energy will establish Australia's first virtual Energy Management Centre. The Centre will act as a collective and authoritative source of information in the fields of energy efficiency, energy conservation and peak demand management for industry and the public. The Centre will become the primary avenue for research and consumer education and engagement in Queensland.

The Queensland Government, ENERGEX and Ergon Energy will establish Australia's first virtual Energy Management Centre.

The Centre will be a virtual organisation comprising two core components:

- An energy information centre—ENERGEX and Ergon Energy will be responsible for establishing and funding an independent website to provide education services and advice on energy management issues, including energy efficiency, energy conservation and peak demand management. The site will provide information on a variety of issues ranging from energy efficiency assessments of household appliances and lighting, to government programs for energy management.
- An energy management policy and regulatory team—the Centre will include a dedicated government policy and regulatory team that will focus on driving the regulatory reform agenda and working closely with the distributors, government agencies and industry to continue refining energy management policy.

The two functions will be overseen by a reference group comprising senior staff from the member organisations, along with members of key government departments, with the express purpose of guiding policy development, monitoring the implementation of the QEMP and sharing information from the member organisations where relevant.

4.2

Residential and community initiatives

The house of the future will have:

- energy efficiency design principles embedded in building codes
- a greenhouse efficient hot water system connected to an off-peak tariff
- a load controlled pool pump connected to an off-peak tariff
- energy efficient air-conditioners that are demand response enabled
- an off-peak circuit in the house, enabling appliances in the laundry, below the sink and in the garage to be used at off-peak times
- access to up to date information on how best to manage energy in the home
- energy efficient lighting and energy efficient appliances
- climate appropriate design, with design features such as natural ventilation and insulation
- access to appropriately trained service providers accredited in energy conservation and demand management providing optimal connection of energy intensive appliances such as air-conditioners.

Benefits to the consumer

- Connection to current off-peak tariffs can save customers more than 40 per cent when compared with normal domestic tariffs. For example, switching a pool pump to Tariff 33 can result in savings of up to $220 per annum.
- Review and development of new tariffs and incentives to help save customers money and reduce the amount of energy they use. For example, new tariffs for demand response active air-conditioners will be examined.
- Bending the electricity demand curve will help manage the cost of electricity. Network costs make up nearly 50 per cent of domestic consumers' electricity bills. Managing the networks more effectively will have positive financial outcomes for Queensland's electricity consumers.
- Access to information and professional, accredited service providers will help customers make informed decisions regarding their appliances which will help them save money.

Benefits to the electricity supply chain

- A peak reduction of more than 900 MW by 2020.
- A potential reduction in utility capital expenditure of up to $3.1 billion.

How we're going to get there

- Require all hot water systems in new homes to be connected to off-peak tariffs.
- Encourage pool pumps in new and existing homes to be connected to off-peak tariffs.
- Develop options including tariff review to enable load control on all new and replacement air-conditioners.
- Develop an accreditation program for electricians as part of a continual learning scheme for residential energy management.
- Examine options to minimise costs associated with standing charges of current off-peak tariffs.
- Require retailers to offer controlled load retail tariffs in combination with customer education activities.
- Establish the Queensland Energy Management Centre as an authoritative source of information for residential customers.
- Investigate ways to encourage energy efficiency in leased properties in the residential sector.
- Deploy energy efficiency improvements in state-owned social housing stock.
- Minimise negative impacts on disadvantaged Queenslanders by forming a whole of government taskforce to investigate social impacts of changes in energy costs.
- Undertake energy management opportunities in remote and isolated communities.
- Work with the Clean Energy Communities program to include demand management opportunities alongside energy efficiency and renewable generation in new residential developments.

Case study

The Cool Change Initiative

Cool Change—Energy Smart Suburbs is an ENERGEX initiative in partnership with the community to help find sustainable ways to use electricity and manage peak electricity demand. The Cool Change trial is the largest trial of its kind in Australia.

Throughout the trial, ENERGEX has fitted energy management devices on air-conditioners, pool pumps and hot water systems in participating homes, enabling the appliances to be remotely cycled by ENERGEX for short periods over the few hours of peak demand.

Over 1800 customers have participated in the trial to date. Cycling of air-conditioners and hot water systems over the second stage of the trial achieved a peak demand reduction of approximately 20 per cent. Surveys conducted throughout the initial trial period found that over 90 per cent of participants reported either no or negligible impact on their summer comfort.

4.3 Commercial and industry

The commercial and industrial facility of the future will have:

- energy efficiency design principles embedded in building codes
- access to the $15 million ClimateSmart Business Service for small to medium sized enterprises (SMEs) that will provide information and assistance to manage energy use
- Energy Management Plans for new large energy users to minimise costs of energy network augmentation and improve energy conservation and efficiency
- incentives to reward direct load control with large commercial and industrial customers
- a power factor (a measure of how efficiently equipment uses electricity) that supports a reduction in demand and enhanced quality of supply
- load management of backup generation to enable the network company to use generators to meet system demand
- opportunities to benefit from new large-scale heating and cooling initiatives
- load control of vending machines
- supply supported by new distributed generation
- incentives for pumps and irrigation facilities to provide direct load control.

Benefits to the consumer

- Improve Queensland's commercial and industrial customers resilience to the impacts of a changing energy environment.
- Financial savings for commercial and industrial customers through improved energy efficiency, which will in turn improve profitability and protect Queensland jobs.
- Tailored information to commercial and industrial customers to educate about specific risks associated with energy costs along supply chains, with access to Government programs through the QEMC energy information centre.
- Access to an appropriately trained and accredited energy workforce including energy auditors and energy efficiency advisors.
- Incentives through tariff reform.
- Opportunities to participate in large-scale heating and cooling projects with reduced electricity costs.

Benefits to the electricity supply chain

- A peak reduction of more than 170 MW by 2020.
- A potential reduction in utility capital expenditure of up to $590 million.
- Localised network support at periods of peak demand with the potential to defer network augmentation.
- Depending on success of commercial negotiations, significant amounts of controllable load may be made available for switching at times of peak demand.
- Deployment of power factor correction equipment will reduce demand on the network.

How we're going to get there

- Develop a scheme whereby all new buildings with back-up generators, located in the central business district of major Queensland centres, offer generation to distributors under commercial arrangements.
- Negotiate with regulatory authorities to ensure that major impediments such as management of exhaust fumes from diesel generators are appropriately addressed.
- Develop a new network and retail tariff for commercial and industrial customers for specific use with a controlled load.
- Provide for audio frequency load control signalling to appliances within the customer's premise and reward customers for allowing network control of these appliances.
- Identify opportunities for an effective regulatory and commercial deployment model for power factor correction to meet customer, distributor and government objectives.
- Strengthening the energy management component of the $15 million ClimateSmart Business Service for a stronger focus on energy efficiency and energy management.
- Ensure new large network connections investigate demand management opportunities.
- Ensure Queensland professionals have the necessary skills to support emerging demand management technologies.
- Develop a state-wide strategy to increase penetration of new/emerging technologies such as precinct-scale chilled storage for air-conditioning.
- Trial new technologies for monitoring and managing energy use in refrigerated beverage vending machines.
- Sponsor a new category in the Premiers ClimateSmart Sustainability Awards Program that recognises innovation in clean energy and energy management.
- Investigate suitable incentives to encourage energy efficiency in the hotel and tourism sector.
- Investigate ways to encourage energy efficiency in leased properties in the commercial sector.

Case study

James Cook University (JCU)

In 2008, JCU in Townsville began a partnership with Ergon Energy to construct a district cooling system at the campus incorporating chilled water thermal energy storage with a centralised chilled water cooling plant. Prior to installation of the district cooling system, the campus had 28 local chilled water plants resulting in high maintenance and running costs.

These local chilled water plants have now been reduced to one central energy plant, reducing the amount of energy required to air-condition the university. By having a central energy plant, the costs of maintaining and upgrading the individual chillers, and additional costs to Ergon Energy of $25 million to upgrade the local substation, have been avoided. The capital cost of the district cooling project was $21 million. The main benefits of the system are:

- *reductions in energy use—the system is expected to deliver a saving of 10 800 MWh in 2010 and has significantly reduced the university's average peak load*
- *reductions in electricity costs—the system is expected to deliver an annual saving of $1.4 million*
- *reductions in greenhouse gas emissions - the system is expected to deliver a saving of 12 000 tonnes in 2010*
- *long life span—the plant has an estimated life span of 30 years.*

4.4

State Government infrastructure of the future

Queensland Government infrastructure of the future will:

- be designed in consultation with network companies to ensure buildings have the highest energy efficiency and demand management capabilities
- be overseen by a proactive, action-orientated interdepartmental group working through the Queensland Energy Management Centre
- have load management technology in any back-up generation installed in new and existing government owned buildings and infrastructure, where appropriate, which will enable network companies to use that generator to meet system demand
- have direct load control on appliances installed within new and existing government buildings where appropriate
- where appropriate provide distributed renewable energy generation.

Benefits to the consumer

- Coordinated delivery of the new energy management agenda will result in broad economy wide outcomes including job creation, reduction in upward pressure on electricity bills and decreased greenhouse gas emissions.

Benefits to the electricity supply chain

- Regulatory and policy support to maximise benefit of the $221 million secured by Ergon Energy and ENERGEX through the Australian Energy Regulator's 2010 Distribution Determinations.

How we're going to get there

- Ensure Government departments that are designing and planning new buildings consult with the network companies.
- Provide energy data collected from programs prescribed under regulation to the Government owned network companies.
- Ensure Government departments contract with ENERGEX or Ergon Energy to develop a network support agreement to make any back up generation available to support the network.
- Identify practical solutions to traditional poles and wires options for areas that require increased load capability.
- Develop extensive data management and verification processes to inform best practice policy development.
- Develop a whole of government leadership group to ensure all significant future policy development considers potential network impacts, and investigate opportunities for energy efficiency and demand management across government.
- Investigate opportunities to use standby generators in Queensland hospitals to meet peak demand and investigate similar opportunities in state and local governments.

Case study

Townsville Hospital

The Townsville Hospital has entered into an agreement to use existing standby diesel generators during times of peak demand. The hospital has three 1.1 MW diesel generators; these allow approximately two-thirds of the hospital's 4.4 MW demand to be met in the event of a network outage.

Hospitals are required to test emergency generators for a minimum of 4 hours per month to ensure they are ready for use in case of network outage. In the past, electricity generated during these tests has not necessarily been put to use.

The Townsville Hospital has now entered into an agreement with demand management company Secure Energy which allows the required testing of the diesel standby generators to occur during times of peak energy demand. The agreement also allows for electricity produced during required testing to be used by the hospital onsite rather than being wasted, and significantly reduces the hospitals impact on the local network.

The initiative will save approximately $9 million in deferred capital expenditure for the electricity network. It will also deliver significant savings to the operating costs of Townsville Hospital.

5 Implementation and review

5.1 Community Engagement

Achieving the goals of the QEMP will require active involvement and engagement of industry and the Queensland community.

The Queensland Energy Management Centre will communicate messages around QEMP initiatives and reinforce the benefits of energy management for the Queensland community. Strategies for stakeholder and community engagement will vary depending on the audience and subject matter, and will be tailored to suit individual QEMP initiatives. Engagement strategies will prioritise the use of the existing communication channels, such as employing the successful ClimateSmart Homes Service for delivery of additional peak demand management and energy conservation messages and products.

A better understanding of the nature and proportion of the energy consumer segments that exist in Queensland is essential to ensure the proposed initiatives are effective, while not unfairly impacting on vulnerable consumer groups. For this reason, the Queensland Energy Management Centre will ensure implementation of QEMP initiatives is underpinned by a thorough understanding of energy consumer groups.

The Queensland Energy Management Centre will also help manage community engagement and moderate outcomes by ensuring a range of policy options are investigated. The Centre will ensure best practice policy development processes are adhered to, including community consultation and the development of Regulatory Assessment Statements.

Case Study

The ClimateSmart Home Service

The ClimateSmart Home Service delivers improved energy efficiency in households across Queensland by installing energy saving devices, providing customers with behaviour change tools and offering detailed advice on ways to reduce energy use.

The ClimateSmart Home Service is making a significant contribution to helping Queensland households reduce their energy use.

As at the end of February 2011, over 245 500 services had been completed, achieving significant energy savings, with over 2.2 million compact fluorescent light-bulbs, and over 72 000 energy efficient showerheads installed.

The ClimateSmart Home Service has proven popular with Queensland households, with a 95 per cent overall satisfaction rating for the life of the program. The service is an effective awareness raising mechanism with the majority of customers continuing to use the wireless power monitor to assess their energy use.

5.2 QEMP work plan

The QEMP describes a comprehensive work plan that will effectively manage Queensland's electricity needs while also managing upward pressure on electricity prices.

The QEMP will initially focus on introducing load management for new infrastructure and appliances.

Implementation of the QEMP will be the key responsibility of the virtual Queensland Energy Management Centre, and will be rolled out incrementally until 2015.

The QEMP includes a number of high value propositions that will provide immediate benefits to Queensland, with staged activities designed to build on the successes of earlier activities. The QEMP will initially focus on introducing load management for new infrastructure and appliances, providing early outcomes, and only later expand to examine retrofits of infrastructure and replacement of existing appliances.

Progress against the QEMP work plan will be reviewed on a quarterly basis. The QEMP implementation plan is provided in the following table.

Priority: High value propositions considered necessary in the short term, to be addressed immediately.

Staged: Initiatives considered necessary in the short term, but to be introduced in a more staged manner to allow for customer, network and industry acceptance.

Develop: Initiatives considered necessary in the medium term, but with significant work required prior to introduction.

Initiative	Description	Priority	Staged	Develop
Residential				
Energy efficiency for social housing	Deploying energy efficiency in state-owned social housing stock (ongoing)	✓		
Social Policy Taskforce	Minimising negative impacts on disadvantaged Queenslanders by forming a whole of government taskforce to investigate social impacts of changes in energy costs (May 2011)	✓		
Clean Energy Communities	Working with the Clean Energy Communities program to include demand management opportunities alongside energy efficiency and renewable generation (from July 2011)	✓		
Domestic load control	Progressing from current pool pump and air-conditioning trials to large-scale rollouts; expanding programs to investigate new technologies and load control of additional classes of appliances; preparing the network for electric vehicles; and investigating installation of off-peak circuits (commence 1 July 2011, implement by end 2012)	✓		
Residential tariffs	Investigating tariffs to encourage take up of load controlled appliances (investigate from July 2011, commence January 2012)	✓		
Energy management for isolated communities	Undertaking demand management opportunities in remote and isolated communities (ongoing)	✓		
Owner/tenant incentives—residential	Investigating ways to encourage energy efficiency in leased properties in the residential sector (from July 2012)		✓	
Sustainable development	Investigating new building codes and installation codes for ducted air-conditioning, wireless electricity use monitors and gas hot water systems (ongoing)			✓

Initiative	Description	Priority	Staged	Develop
Commercial and Industrial				
Proactive energy management for small to medium enterprises	Adapting the existing ClimateSmart Business model to focus more strongly on energy efficiency and energy management (by July 2011)	✓		
Energy Innovation Awards	Sponsoring a new category in the Premiers ClimateSmart Sustainability Awards Program that recognises innovation in clean energy and energy management (from 2011)	✓		
Energy Management Skills Strategy	Ensuring Queensland professionals have the necessary skills to support emerging demand management technologies (develop in 2011, implementation 2012)	✓		
Energy Management Plans for large energy users	Reducing unnecessary infrastructure by ensuring new large network connections investigate demand management opportunities (from July 2011)		✓	
Large-scale Cooling and Heating Strategy	Developing a state-wide strategy to increase penetration of technologies such as precinct-scale chilled storage for air-conditioning (develop 2011)		✓	
Load control for vending machines	Trialling new technologies for monitoring and managing energy use in refrigerated beverage vending machines (commence July 2011)		✓	
Tourism sector energy efficiency initiatives	Investigating suitable incentives to encourage energy efficiency in the hotel and tourism sector (announce July 2011)		✓	
Owner/tenant incentives—commercial	Investigating ways to encourage energy efficiency in leased properties in the commercial sector (by July 2012)		✓	
Commercial and industrial tariffs	Investigating tariffs to encourage load control and reviewing existing tariffs for agricultural applications (investigate options from July 2011)		✓	
Generation initiatives	Expanding existing Singe Wire Earth Return (SWER) Improvement project and Sustainable Wide Area Network Support (SWANS) initiatives (individual project plans - ongoing)			✓
Government				
Partnerships for new infrastructure	Working with distributors to identify energy conservation and demand management opportunities when building or upgrading government facilities and infrastructure (guidelines by late 2011)	✓		
Government leadership	Forming an interdepartmental leadership group to ensure all significant future policy development considers potential network impacts, and investigating opportunities for energy efficiency and demand management across government (April–July 2011)	✓		
Energy management for Queensland's hospitals	Investigate opportunities to use standby generators in Queensland hospitals to meet peak demand (from July 2011)	✓		
Load management of backup generation	Encouraging state and local governments to include load management of backup generation in all government buildings and infrastructure where appropriate (by July 2012)			✓
Government load control	Including direct load control capability in all government buildings and infrastructure where appropriate (by July 2012)			✓
Enablers				
Queensland Energy Management Centre	Establishing the Queensland Energy Management Centre (commence July 2011)	✓		
Data management	Collecting energy use data, measuring and verifying success of programs and increasing data sharing between distributors and government (ongoing)	✓		
Disaster preparedness and recovery	Ensuring the government is prepared for the rapid deployment of energy management solutions when refurbishing and rebuilding residential, commercial and government facilities after major disasters.	✓		
Research and development	Supporting research into load management devices, consumer segmentation and expanding the scope of research and development opportunities available to distributors (from July 2011)			✓
Retailers	Work with electricity retailers to investigate options for better provision of information on demand management and energy efficiency.	✓		

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