

Submission to the Queensland Productivity Commission Electricity Pricing Inquiry

Local Government Infrastructure Services
November 2015

Introduction

Established in 2005, Local Government Infrastructure Services (LGIS) is Australia's only infrastructure services company focused on local government. As LGIS is fully owned by the Local Government Association of Queensland (LGAQ), we work closely with councils in an environment of transparency and trust.

LGIS is one of Australia's most highly-experienced infrastructure advisors, with outstanding credentials. Our team members have worked on some of Australia's largest infrastructure projects across a wide range of sectors relevant to local government, including energy efficiency, renewable energy generation and community engagement on energy efficiency.

LGIS is currently working with several Queensland councils to deliver a large scale renewable energy program utilising geothermal power plants and solar arrays to provide power to local government and community assets located throughout regional Queensland. To efficiently deliver these projects, LGIS draws on its extensive experience of assisting councils through all stages in the asset lifecycle across a range of infrastructure.

LGIS is grateful for the opportunity to provide this submission, which covers three areas mentioned in Section 4 of the *Electricity Pricing in Queensland* Issues Paper: energy efficiency, isolated energy supply systems and local government involvement in the supply of energy.

Energy Efficiency

The Issues Paper describes the Irrigation Energy Savers and Energy Savers Plus programs as examples of effective energy efficiency and demand management programs. LGIS considers that these and other demand management programs can not only significantly reduce consumers' energy bills, they will also reduce utility costs through alleviating strain on capacity constrained networks and allowing the deferment of network augmentation.

LGIS has considerable experience of energy efficiency initiatives. From 2008 to 2012, LGIS delivered the largest residential energy efficiency project ever undertaken in Australia and one of the largest in the world. The ClimateSmart Home Service (CSHS) was a Queensland Government residential energy efficiency initiative designed to facilitate behaviour change that would lead to lower electricity consumption in Queensland and reduce greenhouse gas emissions arising from residential energy use. The design of the Service utilised community-based social marketing principles and revolved around an innovative combination of technology educational tools, prompts and communication.

With a total of 344,371 completed services, the CSHS achieved a customer uptake of one in five eligible Queensland households. Participant households achieved an average reduction in electricity consumption of 6.2 kilowatt hours per day - most of which was attributable to behaviour change. The overall reduction in greenhouse gas emissions attributable to the CSHS was calculated as 3,114,104 tonnes of CO₂ equivalent. In addition, overall customer satisfaction with the CSHS was exceptional, with an average of 96 per cent for the duration of the program.

LGIS worked with Ergon Energy to concentrate CSHS delivery in North Mackay and Mt Isa, where Ergon was experiencing significant capacity constraints. Ergon combined with LGIS to market the services in these areas and paid the customer contribution for eligible consumers. Consequently up to 25 per cent of targeted households received services, providing significant reductions in demand on infrastructure.

Ergon now offers a range of free services to assist its business customers monitor their energy use in detail and advise customers of energy efficiency measures. From its research and experience of similar programs LGIS considers that that these services would not only reduce

energy bills, they would encourage improvements in overall business efficiency and performance. LGIS therefore encourages its clients to take up the Ergon services as an adjunct to the LGIS energy projects.

Demand management is a highly cost-effective means of reducing electricity bills. Other options for energy cost reduction such as embedded generation of renewable energy should incorporate a demand management program to limit the capacity of embedded energy required, especially with respect to peak demand, and therefore reduce capital costs.

Isolated Energy Supply Systems

LGIS has engaged with many councils where energy is provided to their communities by isolated supply systems. Councils have expressed concerns that reflect the issues identified by the Independent Review Panel related to efficient delivery of service, quality of services and support for regional development. In particular, some councils are frustrated that current supply arrangements limit their ability to provide embedded generation to reduce energy costs and provide more flexibility to meet energy demands. While reliability of supply is not generally raised as an issue, there is concern that restrictions that are designed to protect the distribution networks will limit the economic growth needed to ensure sustainability of these communities.

LGIS has also discussed with Ergon personnel the operation of the isolated supply systems, where the financial and environmental sustainability issues associated with the current diesel generators has led Ergon to consider their replacement with renewable energy technologies. In particular, LGIS is aware that Ergon has been considering geothermal energy plants for western Queensland isolated supply systems and fringe of grid locations due to the geothermal plants' low operating costs and ability to provide constant base load power.

The Independent Review Panel's options for alternate service delivery by private sector operators, as quoted in the Issues Paper, could address the issues raised by councils and Ergon. However consideration of such options should take into account that councils are the major consumers and key stakeholders for the isolated supply systems.

Rather than private sector local service agents or providers taking over the delivery of power, there is an opportunity for local government to operate the isolated systems. It would be beyond the capacity and capabilities of many councils to operate their own communities' isolated power supplies, but delivery by a local government owned entity managed by the LGAQ and LGIS would provide advantages over individual systems being operated by private companies. A state-wide approach would also ensure consistent performance across all communities and prevent 'cherry-picking' by private operators of the most financially viable systems.

Local Government Energy Supply

LGIS is working with nine councils in North-, Central- and South-Western Queensland to develop geothermal power plants that will provide electricity to council assets in 11 towns. A further nine councils are considering joining the program that will save each council between \$5 million and \$20 million in electricity costs over 20 years. The total potential cost savings to these councils is more than \$150 million over 20 years.

The first council in the program, Winton Shire Council, has committed to construction of a 300 kilowatt geothermal power plant to provide electricity for Council's main assets in Winton, with a total annual consumption of approximately 1,500 megawatt hours. Council previously engaged

LGIS to provide a pre-feasibility review and concept design study for the project, and LGIS is now managing procurement, construction and commissioning of the plant.

Council undertook the geothermal energy generation project as a means of obtaining a more reliable power supply as well as to make savings in current and future electricity usage charges. Power for the Council assets is currently provided by Ergon Energy through its distribution network, whereby electricity is generated at Charters Towers and distributed to consumers using a Single Wire Earth Return (SWER) line. This SWER line has been subject to significant load demand increases in recent years, which results in frequent voltage variations and consequent brown-outs at Winton, at the end of the SWER line.

As part of the pre-feasibility review, LGIS engaged with Ergon to determine how electricity from the proposed geothermal power plant could be distributed Council assets and, if possible, sold to Ergon or other consumers to generate an additional revenue stream. LGIS considered the following options for using the existing Ergon network at Winton.

1. Tolling: Council pays a cost to Ergon to carry the energy on its existing infrastructure.
2. Virtual Net Metering (VNM): install a meter at the point of generation and individual meters at all Council assets to be supplied, deduct Council consumption from production ('netting off') and Council or Ergon pays for any overuse or oversupply.
3. Independent network: rent space on Ergon's existing poles and create an independent network.
4. Feed-in tariff: Council sells electricity to Ergon through a connection to the grid, with Ergon paying a tariff on the amount of electricity provided.

After discussions with Ergon, LGIS concluded that none of the above options are viable. LGIS therefore determined that the best solution for Council would be to build a private underground distribution network to direct power from the generating plant to Council assets.

The barriers that need to be overcome to distribute power from the geothermal energy generation plant at Winton would also apply to any embedded energy project where distribution of power away from the generation site is required. These barriers are a major issue for any embedded energy project, and are discussed in more detail below.

Options for Utilising Ergon Network Assets

During initial discussions Ergon Energy advised LGIS that the tolling and VNM options are not supported by current legislation. Ergon also advised that if these became available, any planning, design and network augmentation required to support the additional power distribution would be totally borne by Council, with likely a large amount of redundancy built into augmentation at Council's cost.

Although permitted, an independent network utilising existing power poles would have the same potential risks and prohibitive cost regime as the other options and, most importantly, Ergon could hold Council liable for any damage or emergent issues while renting the poles. In addition, should Ergon's existing poles and wires infrastructure be deemed unsuitable for an additional wire Council would be required to fund the upgrade of these assets, and a costly asset audit would be required before any arrangements were negotiated.

Connecting the geothermal power plant to the Ergon network and accessing Ergon's feed-in tariff for renewable energy could be a cost effective option. However the low value of the feed-in tariff currently offered by Ergon (6.3 cents per kilowatt hour) renders this option non-viable.

Introduction of Local Network Charges and Virtual Net Metering

In addition to the potential for VNM to reduce usage charges, the infrastructure charges that are paid to the Distributed Network Operator to operate the regional transmission network could be reduced to account for the electricity generated by Council's power plant being used within the local area (instead of being transmitted from Charters Towers on the SWER line). However, as for VNM such local network charge arrangements are not permitted under current legislation.

As the existing network is part of the National Electricity Market (NEM) changes to the NEM rules would be required to allow local network charges and/or VNM. In support of a request for such a rule change submitted by the City of Sydney, Total Environment Centre and the Property Council of Australia in July 2015, the University of Technology Sydney's Institute for Sustainable Futures (ISF) is running virtual trials of local network charges and VNM. The trials are being conducted in five locations around Australia including in Queensland, where Ergon is a project partner, and will investigate the business case and methodology of applying local network charges and virtual net metering at those locations

At the invitation of ISF, Winton Shire Council recently agreed that the Winton geothermal energy project be included as the Queensland trial project. Generation data provided by LGIS for the proposed geothermal power plant will be modelled and compared with historic consumption data for the relevant Council assets provided by Ergon, to determine an appropriate local network charge and pricing for VNM. The business cases for the project with and without local network charges and/or VNM will be compared to the case utilising a private network to assess which option provides the optimal result for Council and Ergon.

The trials commenced in November and will be complete by the end of 2015, with final outputs to be made available in early 2016. Confirmation of any advantages of applying local network charges and/or VNM to the existing network compared with building a new private network would facilitate the introduction of these initiatives.

In addition to the significant positive impact on the Winton project, introduction of VNM and/or local network charges would enhance the viability of similar projects throughout Queensland. It is likely that LGIS's current geothermal energy program would at least double in size in the short term, providing potential savings and reliable energy supply for whole communities, boosting economic development of regions and bringing significant improvements for capacity constrained networks and overloaded distribution infrastructure.

LGIS is discussing the ISF trial with the Department of Energy and Water Supply (DEWS) and investigating regulatory barriers to the eventual introduction of VNM and local network charges. DEWS advised the NEM rule change process includes extensive consultation with NEM participants, and consideration of the rule change is therefore likely to extend over one year. The aim of the consultation is to confirm that the proposed rule change would result in an overall net benefit to the market, but DEWS advised it is likely that some network providers will have concerns with the proposed change and resulting potential for cost shifts. Apparently such potential adverse impacts were not considered in the rule change proposal.

In addition to the NEM rule change, introduction of VNM and/or local network charges would require changes to Queensland legislation. These would require the usual consultation and process that applies for any legislative changes, and would be subject to the demands of the Queensland Government's legislative change agenda.

Establishment of a Private Network

In the absence of any introduction of local network charges and/or VNM, a private network taking power from the geothermal plant to Council assets is the preferred solution to overcoming the barriers to connecting to Ergon's network. Under this solution Council assets would remain connected to the Ergon network in order to provide a degree of redundancy and account for any peak demand in excess of the geothermal power plant capacity. Council will still incur fixed network charges, but usage charges will be avoided except for any occasions when peak demand requires additional supply. In addition, demand charges applied to some assets will be avoided or at least significantly reduced due to the reduction in demand on the Ergon network.

The Winton private network would be constructed on Council land and road reserves with any crossings of State controlled road requiring an easement from the State Government. Ergon Energy Solutions advised that the proposed network would be too extensive to allow a low voltage network alone. Consequently the network would include a high voltage supply from the geothermal plant to a centrally located transformer and low voltage lines from the transformer to the connected assets.

Power supply from the private network would be connected to each Council asset through a Zero Export Device located between the meter and the switchboard. The Zero Export Device is required to ensure no power is fed into the Ergon grid from the private network. Ergon currently requires full connection assessment for any generation connection over 5 kilowatt, however installing a Zero Export Device avoids this requirement as no power will be exported to the Ergon network, either when the network is delivering power or during power failures. This will enable Ergon to continue to carry out its repair and maintenance obligations without impact by or on the private network.

The Winton geothermal power plant could produce approximately 650 megawatt hours of surplus generation annually that could be sold directly to consumers, where it is technically and economically viable to do so. Additional users on roads where the Council network is located could be connected to the network as is the case for commercial Power Purchase Agreements supplied from rooftop solar panels, with zero export to the grid. LGIS obtained legal advice that, subject to meeting all the technical issues and obtaining State Government agreements, there are no regulatory impediments to constructing a private network for Council use only, or selling excess power to other consumers.

Whole of Community Energy Supply

The Winton town bore to be used for the proposed geothermal power plant could provide water of sufficient temperature and flow rate to generate up to 1 megawatt electricity, subject to State Government approval of the necessary increased water allocation. At least 2 megawatt capacity would be needed to supply power to the current Winton consumers, which could be provided by an additional bore and generating plant.

Expansion of the current geothermal energy project could also include other renewable energy technologies to provide the optimal mix of base load and peak power, and provide for future additional consumers that could be attracted to the area by the prospect of sustainable, reliable power supply. For example, a combined geothermal, solar and battery plant could provide sufficient energy for an expanded Winton community of 2,000 residents and future businesses in and around the town such as a meat works, cattle transport hub and water distillation plant.

Using an extended private network would not be a cost-effective means of distributing power to all Winton consumers. Consideration of an expanded renewable energy project will therefore depend on resolution of the issues discussed above that currently prevent use of the Ergon network.

The optimal solution may be to use the Ergon distribution assets as a microgrid, either still connected to or separated from the wider Ergon network. The assets could be transferred to the entity owning the renewable energy power station (most likely a partnership with Winton Shire Council as the expanded facility would be beyond Council's financial capacity). As noted in the issues paper, such a transfer would raise technical, legal and economic risks and issues, but the potential benefits to the State Government in reduction of its community service obligation payments to Ergon under the uniform tariff policy (said to be \$5 million per year for Winton) would be significant.

The opportunities and barriers discussed above for Winton Shire Council to supply and distribute energy to the wider community apply to any other regional local governments. The isolated supply systems would be the most readily transferred to local government as the generator and distribution network is separate from the wider Ergon network (and the NEM). The aggregated approach to local government operation of the isolated system power supplies could be extended to transfer ownership of the Ergon generation and distribution assets at those communities to a single entity established in conjunction with LGAQ and LGIS, enabling more localised solutions to energy issues and relieving Ergon of the need to service those communities.

The financial viability of the isolated power systems under local government ownership could be improved by replacement of diesel generators by renewable energy power plants. LGIS's experience shows that the low operating costs of geothermal power plants in particular can generate substantial savings compared with current tariffs, which can fund plant replacements and offset greater costs for systems where geothermal resources are not available, and other renewable energy technologies would be utilised.

Resolution of issues related to pricing, operator capabilities and capacity, compliance with requirements for electricity supply and cost fluctuations between communities would be facilitated through an aggregated approach to local government power supply. Given its experience of local government energy and infrastructure projects, LGIS is well placed to support any local government involvement in the supply of electricity.