Local Government
Infrastructure Services

4 February 2016

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Dear Sir/Madam

ERC0191 National Electricity Amendment (Local Generation Network Credits) Rule 2015

Please find attached a submission from Local Government Infrastructure Services on the proposed National Electricity Amendment (Local Generation Network Credits) Rule 2015.

Thank you for the opportunity to comment on the proposed rule change. LGIS is participating in the Institute for Sustainable Futures (ISF) project that aims to support the proposed rule change and supports the ISF submission to the AEMC. In particular, LGIS agrees that:

- the consultation timeframe should be adjusted to ensure that the AEMC and other stakeholders can take account of the results from the ISF project
- the assessment framework should be modified to include consideration of potential incentives for inefficient duplication of network infrastructure under current arrangements
- a timeframe of 15 to 20 years should be used to assess the effects of an LGNC on network costs and on consumers, rather than a single regulatory period, and
- the assessment framework should take into account the reliability and security of embedded generation technology.

Sincerely

Daniel Westall
Director, Energy Projects

Submission to the Australian Energy Market Commission Consultation Paper on Local Generation Network Credits

Local Government Infrastructure Services
February 2016

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, 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. The current restrictions on the use of existing distribution networks has led to these projects including private distribution networks that duplicate the existing infrastructure, to connect the renewable energy generator with council assets. While this approach would generate inefficiencies that are undesirable to all stakeholders, it is the most economically viable solution available under the current energy regulatory framework.

The Winton Shire Council geothermal energy project in Central-Western Queensland is one of the case studies for the Institute for Sustainable Futures (ISF) research project *Facilitating Local Network Charges and Virtual Net Metering*, which aims to develop alternatives that would encourage the use of existing networks and avoid the need to consider 'behind the meter' solutions such as private networks. On behalf of Winton Shire Council, LGIS has been working closely with Ergon Energy Queensland and ISF to explore the potential impacts on the project of local generation network credits (LGNC) and local electricity trading (LET).

LGIS is aware of and supports the ISF submission on the proposed National Electricity Amendment (Local Generation Network Credits) Rule 2015. In particular, LGIS agrees that:

- the consultation timeframe should be adjusted to ensure that the AEMC and other stakeholders can take account of the results from the ISF project
- the assessment framework should be modified to include consideration of potential incentives for inefficient duplication of network infrastructure under current arrangements
- a timeframe of 15 to 20 years should be used to assess the effects of an LGNC on network costs and on consumers, rather than a single regulatory period, and
- the assessment framework should take into account the reliability and security of embedded generation technology.

LGIS is grateful for the opportunity to provide this submission, which provides some background to our renewable energy program and provides specific comment on the questions raised in the Consultation Paper on the National Electricity Amendment (Local Generation Network Credits) Rule 2015.

Local Government Geothermal Energy Program

Geothermal Energy Generation

Many Queensland regional towns obtain their water supply from bores drawing water from the Great Artesian Basin. The bore water often comes to the surface at temperatures exceeding 50 degrees Celsius and must be cooled before being distributed to residences and businesses. LGIS is investigating using geothermal power plants in several of these towns to cool bore water and generate electrical power for use in the towns.

The technological feasibility and reliability of geothermal energy generation from bore water is demonstrated by the extensive use of such generation overseas. In addition, LGIS has completed several high-level reviews that demonstrate the feasibility of geothermal energy generation using bores in Queensland towns.

The main advantage of geothermal energy generation is that it is a relatively simple and highly reliable source of base load power that is independent of weather conditions and time of day. In addition, the power plant has low operating and maintenance costs, with very high availability and long operating life.

LGIS is working with ten councils in North-, Central- and South-Western Queensland to develop geothermal power plants that will provide electricity to council assets in 12 towns. A further eight councils are considering joining the program, which 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 Queensland 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.

Options for Utilising Existing Distribution Network Assets

As part of the initial pre-feasibility review of the Winton geothermal energy project, 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 distribution network at Winton.

1. Tolling: Council pays a cost to Ergon to carry the energy on its existing infrastructure.
2. Virtual Net Metering (VNM) (also called Local Electricity Trading): 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.

During initial discussions Ergon Energy advised LGIS that the tolling and VNM options are not supported by current legislation. Although permitted, an independent network utilising existing power poles would have high risks of prohibitive costs as 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.

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. Subsequent engagement with senior management at Ergon and the Department of Energy and Water Supply has not yet led to any resolution of the issues restricting use of the Ergon network.

Establishment of Private Networks

In the absence of any viable option for using existing networks, all LGIS reviews of geothermal energy projects include modelling the provision of a private network taking power from the geothermal plant to Council assets. Under this solution the length of the network is optimised to include as many Council assets as practicable given their location and energy consumption. The 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. The council would 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 private networks would be constructed on council land and road reserves with any crossings of State controlled road requiring an easement from the State Government. Where the proposed network would be too extensive to allow a low voltage network alone, 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 (ie, behind the meter). The Zero Export Device is required to ensue 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 geothermal power plants could produce surplus generation 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.

Comments on the AEMC Consultation Paper

Question 1 Assessment framework

As described above the Winton Geothermal Energy Project is one of five renewable energy generation projects being included in a virtual trial of LGNC through an ISF project. The trial will investigate alternatives for implementing LGNC and LET and compare the overall costs with the costs of the proposed energy distribution through a private network. Initial results indicate that LGNC and LET combined will provide cost savings to consumers while ensuring losses in distributor revenue will be reduced compared with that for the private network case, where a portion of the costs savings would be spent on network capital and operational expenditure.

The ISF project is due be completed in August 2016, which may not allow sufficient time for the final results to be taken into account in the assessment of the proposed rule change. LGIS therefore considers that the timeframe for the proposed rule assessment should be extended to ensure that the final results of the ISF project can be adequately considered by the AEMC.

LGIS's reviews of potential geothermal energy projects highlight the disincentives to future use of existing networks for distribution of embedded generation power, resulting in a reducing number of network users available to meet the costs of the network. The availability of LGNC would encourage the embedded generators to access the existing network rather than seek behind the meter solutions, providing benefits for all consumers on the network. The assessment framework should therefore consider the value of LGNC to all consumers, not just generators.

When assessing the viability of embedded generation projects, LGIS considers whole of life costs and revenues. In most cases asset life would be expected to be substantially greater than the five year regulatory period proposed for the assessment framework. LGIS assessments are based on a 20 year period (still considerably less than the expected asset lifetime of a geothermal power plant), and LGIS considers the proposed assessment framework should be based on comparable timeframes.

The reliability and security of embedded energy generation connected to a distribution network would be highly relevant to consumers and distributors. On the of the main advantage of a geothermal power plant, for example, is the consistency and predictability of supply, with very little down time required for maintenance. This reliability is enhanced for the Winton project, where two geothermal power plants are proposed, offering base load and peak load supply and additional security of supply.

This security is a major advantage at regional towns such as Winton, where the grid power supply via a very long SWER line is prone to frequent brown outs during voltage drops due to increased load on the line. Consistent additional power supply from an embedded generator connected to the SWER line via the distribution network would benefit all consumers supplied by the SWER line, irrespective of the timing of the peak load. LGIS considers that the proposed assessment framework take into account the reliability and security of embedded generation technology when considering the proposed rule change

In summary, LGIS considers the following change should be made to the proposed rule assessment framework:

- The timeframe for the proposed rule assessment should be extended to ensure that the final results of the ISF project can be adequately considered by the AEMC.
- The assessment framework should consider the value of LGNC to all consumers of providing an incentive for generators to remain connected to the existing distribution network rather than implementing behind the meter solutions.
- The proposed assessment framework should be based on timeframes comparable to the asset lifetime of the embedded generators.
- The proposed assessment framework should take into account the reliability and security of embedded generation technology.

Question 2 Perceived issue with current NER

The current regulatory restrictions on use of existing distributing networks for embedded generation are a significant barrier to investment in projects that would contribute to the achievement of the National Energy Objectives (NEO). The establishment of private networks to enable behind the meter connections is an inefficient solution as it duplicates current infrastructure and is available only to council assets. Private networks are therefore only a viable option where there are assets in the vicinity of the proposed generator with sufficiently large power consumption to provide savings great enough to justify the cost of the network.

In the absence of incentives such as LGNC the potential for embedded energy generation in regional towns is limited, due to the need for private networks. There are a number of communities in regional Queensland with geothermal resources that could support an embedded generator if the whole community could be connected through the existing distribution networks. LGIS estimates more than 30 communities could support a geothermal power plant if incentives to use the current networks were provided.

Question 3 Determining Avoided Costs

Ergon's network includes 65,000 km of SWER lines across regional Queensland. Voltage drop on the SWER lines with increasing load and consequent brown outs at towns serviced by the lines is becoming a significant issue for Ergon and consumers, prompting a program of battery installations to decrease voltage drops at a cost of approximately $100 million. Embedded energy in regional towns can reduce the need for solutions such as battery installations, and avoid associated costs.

Avoided costs for SWER line augmentation are highly location specific, as load increases apply to a specific line and the embedded generators would need to be connected to that line to be effective in avoiding costs. In addition, the generator must provide power at times of peak load to effectively reduce voltage drops. Therefore, the location and consistency of the embedded generation should be an important consideration oi the determination of the LGNC.

Question 4 Specificity of Calculations

As described under Question 3, the network cost that could be avoided through embedded generation is specific to the location and consistency of the generator. The value of LGNC available generators should reflect these specifics, but as illustrated in the consultation paper not be so complicated as to reduce that value. The outcomes of the virtual trials undertaken as part of the ISF project could guide the level of specificity of calculations.

Question 5 Potential Benefits of the Proposal

The comments above set out the potential benefits of the proposed rule change. In summary there are:

- avoiding current disincentives to embedded generation network connections that could lead to duplication of infrastructure and diversion of cost savings
- improving the viability of embedded generation projects at more locations, therefor increasing cost savings to consumers
- reducing network augmentation and replacement costs, in particular for the Ergon SWER network in regional Queensland, and
- encouraging the expanded use of geothermal energy generation that would provide more reliable power to regional towns, encouraging economic development and improving regions' sustainability.

The method for determining the value of LGNC payable to generators should be determined by specific factors including location and consistency of supply. The LGNC should not be determined by type or age of generator, but by performance. The outcomes of the ISF project would be of assistance in determining LGNC values without the calculations becoming a significant administrative burden.