COGENERATION AND TRIGENERATION IN NEW SOUTH WALES

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Mr Jonathan O'Dea MP Chairman Public Accounts Committee Parliament House Macquarie Street, Sydney NSW 2000

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Dear Mr O'Dea

Cogeneration and trigeneration in New South Wales

Origin Energy (Origin) appreciates the opportunity to provide comments to the New South Wales (NSW) Legislative Assembly, Public Accounts Committee (PAC) inquiry into cogeneration and trigeneration (cogeneration) in NSW. Origin has an active interest and extensive experience in installing and operating cogeneration systems across Sydney and Melbourne through Cogent Energy (Cogent), an Origin subsidiary. We recognise the work of the PAC forms part of a broader reform agenda by government and industry proponents to promote efficient levels of embedded generation and demand side engagement, more generally. In responding to the PAC terms of reference, we do so in the context of these broader reviews.

Cogeneration is an established technology that has been used globally since the 1880's. The extensive use of embedded generation systems has allowed for the development of effective risk management controls, enabling issues such as gas safety, acoustics, exhaust emissions and electricity grid connections to be well regulated by relevant industry standards and codes of compliance. Achieving and maintaining acceptable safety standards is particularly important for mono-nitrogen oxides (NO_x) emissions control, as mandated by the Environmental Protection Agency (EPA). This is particularly important where larger cogeneration plants are installed in high-density areas, such as the Sydney Central Business District (CBD).

We support the introduction of a nationally consistent regulatory framework for cogeneration that: (1) properly recognises the emissions reduction benefits available from precinct cogeneration; and (2) promotes innovative and flexible, cost reflective network tariffs for the deferred use of the transmission and distribution networks for the energy consumed. Such an approach can promote the efficient adoption of cogeneration systems in buildings and precincts across Australia. However, the current arrangements in Australia fall short in these key areas. Additionally, Australia lags behind the regulatory frameworks supporting cogeneration in markets across Europe and the United States. As such, the existing regulatory impediments continue to stymie the commercial adoption of cogeneration locally, as evidenced by the decision in June 2013 to abandon the City of Sydney Decentralised Energy Master Plan - Trigeneration project.

Origin recommends that the best way for PAC to help promote development of this nationally consistent framework is to support and endorse the existing market reviews and policy development processes currently underway. This includes the Standing Council

of Energy and Resources (SCER) work stream on embedded generation¹ and the Australian Energy Market Commission's (AEMC) consultation on improving the arrangements for connecting embedded generators.² Leveraging off the existing processes minimises the risk of regulatory duplication and allows for coordinated and complementary recommendations to progress in a timely and informed manner.

The remainder of this submission highlights the issues with the current framework and provides guidance on what role PAC could play in facilitating progress.

The practical benefits of cogeneration

There are numerous benefits associated with the installation of cogeneration within a building or precinct. Cogeneration systems are installed in parallel with existing electrical grid systems, which mean the grid is always active while the plant is operating. This, in effect, provides a dual supply system. End-users have supply redundancy while the local network has access to a source of demand management that may serve as a non-network option to defer network augmentation over periods of peak demand.

Cogeneration enables risks to be identified and managed adequately in a cost effective manner. Issues such as gas safety, acoustics, exhaust emissions and electricity grid connection are well regulated by the relevant industry standards and codes of compliance. The use of best-available-technology (as mandated by the EPA) for NO_x emissions control for larger cogeneration plants installed in high-density areas (such as the Sydney CBD) help ensure that cogeneration plants achieve acceptable safety standards.

Whilst there is some financial risk associated with a complex design and installation of a cogeneration project, experienced and highly skilled operators have the capability to design, construct and operate these plants with negligible risk to the prospective owners and consumers. Correctly designed and configured connections should also minimise supply interruptions. From Cogent's practical experience, we find availability and reliability in excess of 98% is achievable. This enables building owners to forecast accurately building generation profiles and therefore identify the consequential requirements of the distribution network - whether it be to export to or import generation from the grid.

The commercial benefits and challenges of cogeneration

National Australian Built Environmental Rating System

From a building owner's perspective, a key commercial driver for the installation of cogeneration is the benefit offered by higher environmental ratings, such as the National Australian Built Environmental Rating System (NABER) rating.³ A higher NABERS rating can potentially increase a building's value and deliver an improved rental yield. Whilst this

¹ AECOM, 'Mid-Scale Embedded Generation Connection Standards, Feasibility Study Final Report,' 17 June 2013, Canberra. p. 20.

² AEMC 2013, 'Connecting Embedded Generators, Rule Determination,' 27 June 2013, Sydney. pp. 51-57.

³ In some instances, this can improve a building's NABERS rating by 1-1.5 stars with Government tenants required to occupy buildings with a minimum of 4.5 stars NABERS rating (<u>http://ee.ret.gov.au/non-residential-buildings/government-buildings/energy-</u>efficiency-government-operations-eego/eego-ratings).

works effectively with an in-building, non-exporting plant, there are significant obstacles encountered with a precinct-scale scheme.

The changes to the NABERS scheme ruling on cogeneration in October 2012 by the Commonwealth Government (and as used by the CBD Scheme) has resulted in an outcome where the lower carbon value of the exported energy component is not recognised in the headline ratings for buildings contracted to take energy under the scheme. This deprives the building hosting the cogeneration system, as well as secondary (or receiving) buildings of the incremental NABERS improvement based on a technical aspect of the scheme.⁴ The reduction in benefits accruing from the scheme can act as a commercial disincentive for development of precinct-scale projects.

We recommend the PAC review limitations under the NABERS scheme preventing building owners benefiting from the environmental star rating from using precinct scale cogeneration and pursue possible solutions under the auspice of the SCER or directly with the DRET.

Cogeneration requires more innovative and flexible tariffs

Cogeneration systems that are connected within a building, downstream from where the market electricity meter is read, may not utilise the transmission and distribution network from the point where electricity is generated and consumed. Cogeneration, therefore, has the ability to completely displace the applicable distribution use-of-network (DUoS) charges for all of the generated electricity. This is an attractive benefit which contributes significantly towards a business case for installing a cogeneration system.

However, when electricity is exported to buildings in precinct-scale projects, all of the distributed electricity is subject to full DUoS charges, irrespective of the distance involved. In some instances, the buildings could be adjacent to each other with only meters of the grid utilised. This situation manifests itself in its extreme when full DUoS charges are levied for in-building plants distributing electricity to multiple switchboards within the same building.

The avoidance of transmission and distribution costs is a well-recognised benefit of cogeneration schemes. A move to cost-reflective network pricing for precinct or export-configured cogeneration schemes could incentivise the adoption and realisation of economic and environmental benefits from cogeneration projects, particularly given the recent increase in DUoS charges.

We recommend the PAC support the Australian Energy Regulator (AER) in identifying incentives to encourage DNSPs within NSW and nationally to adopt more innovative and flexible, cost reflective tariffs with an additional focus in relation to the concept of Location of Generation and Use (LoGU) in contrast to the current almost exclusive attention to Time of Use (TOU) incentives.

⁴ This occurs when power is generated but not recognised on the switchboards of the building or other buildings where the electricity is being exported with metered energy read at a single point on a specific switchboard.

The cost of gas

Natural gas has traditionally composed a significant proportion of operating costs in a cogeneration project. The east coast gas market is in a period of significant change and transition. In this context, businesses are identifying every opportunity to streamline and manage operating costs to help keep projects commercial, including obtaining gas from renewable sources ranging from anaerobic digestion to the production of bio-gas.

We understand the NSW EPA is conducting a consultation on NSW Energy from Waste including exploring options for Syngas, or synthesis gas, which is a fuel gas mixture consisting primarily of hydrogen, carbon monoxide, and is the product of a gasification process. We strongly support and encourage this work and recommend it continues as a matter of priority for the NSW EPA. Alternative sources of gas, apart from being decentralised in nature, are also an environmentally sustainable option based on renewable feed-stocks.

A major component of the cost of delivered gas is the transportation charge levied by gas network service providers. The inflexible and regimented approach to gas transportation pricing does not allow for the aggregation of multiple sites, which would allow a precinct operator to optimise gas demand across multiple plants. Cost reflective pricing for network tariffs could be applied for the use of gas networks as currently used and being developed for electricity.

We recommend PAC support initiatives to promote the supply of gas in NSW and applicable tariffs reviewed by the AER.

Regulatory frameworks and the operation of cogeneration

As noted above, Australia is behind international markets in supporting a regulatory framework that supports efficient investment in cogeneration. In identifying the jurisdictional differences in these regulatory regimes, Australian government and policy bodies have undertaken considerable investigation and industry consultation into cogeneration and demand side management, more generally, to identify key problems and propose solutions. The AECOM report to DRET noted the range of investigations into embedded generation since 2004,⁵ which includes the Productivity Commission reviewing and the AEMC recommending rule changes to facilitate the efficient connection of embedded generation.

In its draft rule determination for connecting embedded generators, the AEMC recognised the commercial barriers with exporting generation to the grid from the perspective of feed in tariffs and the need for cost reflective tariffs.⁶ In particular, the Commission noted that the SCER, Productivity Commission and AEMC Power of Choice Review have all considered the issue of developing flexible feed in tariffs concluding:

The Commission considers that in time, when more innovative and flexible tariff arrangements are developed and deployed in the NEM, that the economic incentives to export electricity to the grid will improve. This will lead to more embedded generators choosing to size their equipment to take advantage of the opportunities in providing electricity to the distribution network at times of peak demand where it is flexible to do so.⁷

⁵ Op Cit, AECOM 2013. p. 2

⁶ Op Cit, AEMC 27 June 2013. p. 66.

⁷ Ibid.

In relation to cogeneration, we support the development of flexible tariffs that can recognise the limited use of the network when exporting generation from a building or precinct.

This, and other recommendations to address the current shortfalls in the Australian regulatory framework, could be addressed through a review into the network charging arrangements covered by the National Electricity Rules and National Gas Rules. Such a review is possible using the existing regulatory processes available under the National Electricity and Gas Laws. The AEMC rule change process to implement improvements to the framework for connecting embedded generation is such an example. We encourage the PAC to endorse these existing processes, offering its support, rather than seeking to run concurrent and duplicate processes.

Conclusion

Cogeneration is a well established and utilised technology both internationally and in Australia. While the technical and safety aspects of cogeneration are well understood and appropriately regulated, key commercial barriers remain that hinder the efficient take up of cogeneration. These impediments include: the NABERs scheme; a lack of flexible and cost reflective feed in tariffs; and gas supply and transportation costs.

We recognise that considerable investigation and consultation has been undertaken by SCER, the Productivity Commission and the AEMC into demand side engagement and embedded and cogeneration, more specifically. We recommend that the PAC leverage off these existing processes and findings when conducting its own deliberations. Of particular importance is the need to promote a national approach to promoting efficient adoption of cogeneration, rather than individual jurisdictions diverging from a single policy.

Should you have any questions or wish to discuss this information further, please contact Hannah Heath (Manager, Wholesale Regulatory Policy) on **Exercise State** or

Yours sincerely,



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