Question 1

How is Powerlink increasing transparency around, and encouraging the use of non-network solutions?

Powerlink has a distribution list of non-network solution providers (the Non-network Engagement Stakeholder Register) who are contacted with each opportunity that arises. Anyone wanting to be added to this list should let us know their contact details. We also ensure a forward view is provided well ahead of the need through the Transmission Annual Planning Report (TAPR). This provides time for non-network solution providers to develop potential solutions which can then be evaluated through the economic assessment process.

This year's TAPR includes a new section (Appendix F), which summarises potential non-network opportunities in the transmission network over the next five years. These are all in relation to the possible replacement of network assets which are approaching the end of service life, since no augmentations are planned during this planning horizon. In addition to keeping members of Powerlink's Non-network Engagement Stakeholder Register group up to date regarding opportunities for non-network solutions, Powerlink also provides technical data to the AREMI platform (nationalmap.gov.au/renewables) to allow potential non-network opportunities to be browsed interactively and overlaid with a range of other datasets.

Powerlink's website has been updated with our network support contracting framework to assist non-network providers with an outline of the key contracting principles that are likely to appear in any non-network support agreement negotiation.

Question 2

Please explain the effect of customer engagement with regards to demand?

Positive examples of where customer engagement has influenced the demand forecast includes input from our Customer Panel, Demand and Energy Forum and annual transmission customer forecast review.

In particular, Powerlink developed the customer momentum factor applied in the forecast through stakeholder engagement with the Customer Panel, previous Demand and Energy Forums and the Queensland Household Energy Survey findings. This factor accounts for customer behaviour in that although parts of the community will utilise more electricity, energy efficient devices and established behaviour are expected to have a dampening effect on increased demand. In line with the resulting demand forecast, Powerlink is not currently forecasting any limitations on the transmission network which would give rise to a need for augmentation of the network.

Powerlink also engages annually with direct connect customers, obtaining their 10 year outlook of demand and energy use. This forms the basis of the bottom up forecast for these customers which is then moderated based on factors including recent history, committed projects, and econometric measures.

Question 3

Why has Powerlink Queensland forecast battery storage so low? Does it include large scale battery storage?

Powerlink's delivered demand forecasts include a modest allowance for future battery uptake by customers at their premises. The forecast of reducing electricity prices extends the payback period of battery storage systems and accordingly delays the uptake of new systems. As a consequence, the forecast capacity of battery storage systems has been reduced within the 2018 TAPR. No allowance has been made for large scale battery systems embedded within the distribution or transmission networks.

This is an assumption made by Powerlink for the purposes of forecasting demand and energy to be delivered from the transmission network. Powerlink makes all its assumptions transparent so that others can adjust if they consider an alternative input is warranted for their own purposes.

Question 4

Do you have a view regarding QNI increased sizing?

AEMO's 2018 Integrated System Plan has identified a case for an imminent minor transmission augmentation, followed by a 'medium' QNI development. Powerlink and TransGrid's own modelling also suggests a likely case for increasing the interconnector capacity. Powerlink and TransGrid will undertake a Regulatory Investment Test for Transmission (RIT-T) process and through that process will test a wide range of feasible options against a range of scenarios. We are currently preparing the detailed inputs required to inform the Project Specification Consultation Report (PSCR), as the first stage of the RIT-T. The RIT-T will also invite non-network proponents to submit alternatives to network development. Powerlink, in coordination with TransGrid, will then carefully consider the possible outcomes of this analysis and associated stakeholder consultation.

Question 5

What planning is underway for electric vehicle (EV) impact?

Powerlink is taking the potential uptake of EVs into account in its demand and energy forecasts. The assumption made in regards to EVs is transparent on Powerlink's website.

Australia has a low uptake of EVs compared to countries like Norway and the Netherlands. Further, it is estimated that a 1% uptake of EVs on the road would result in approximately 0.2% increase in energy. Powerlink has adopted the neutral uptake scenario from the Electric Vehicle Insights paper prepared in September 2017 by Energeia for AEMO. The forecast is for an increase in energy delivered from the transmission system of 0.7%. There is no addition to the maximum demand forecast as it is assumed the EVs would be charged outside the peak demand period. Powerlink will continue to monitor forecasts and introduce plans as a more imminent and firm need arises.

Powerlink cannot comment on any planning in the distribution network in relation to EVs.

Question 6

The discussion has focused on new generation – how will Powerlink ensure that network changes will not increase network costs to the detriment of existing demand customers, particularly customers with inflexible loads?

Powerlink's overarching objective is to minimise the cost of its services while providing safe and reliable transmission services to customers. The transmission network will continue to change in response to changing inputs such as demand or load and asset condition, as well as generation. There are currently a lot of generators seeking connection to the transmission network and this has resulted in the discussion seeming to be focused on generation.

Powerlink is seeking to ensure network development is co-optimised with generation development to meet demand. Initiatives such as the Integrated System Plan will help to facilitate identification of co-optimised generation and network development plans that minimise the total energy cost to customers.

Question 7

How will higher integration of asynchronous generation impact the calculation of power system stability limits and outage planning?

As asynchronous and synchronous generators connect to the power system, existing limit advice is updated and provided to AEMO. The introduction of new generation into the power system offers larger combinations of possible dispatches. Powerlink will continue to monitor and model the secure technical envelope to include plausible new dispatches.

In terms of calculation techniques, these are influenced by the mode of failure defining the technical envelope. AEMO released System Strength Impact Assessment guidelines, detailing asynchronous generator's new responsibility to 'do no harm' under system normal conditions. Where asynchronous generating systems may introduce instabilities during system normal conditions, remediation schemes are required to be installed as part of the generation project.

More detailed Power System Computer Aided Design (PSCAD) modelling will be undertaken where traditional planning tools do not provide sufficient accuracy (particularly under planned outage conditions).

Question 8

How is Powerlink going to manage the congestion on the network with the arrival of a large number of renewable projects?

Powerlink has open access obligations to its transmission network. Connection of any generator, renewable or not, will change flows on the transmission network. Limit equations will be determined and implemented through the AEMO market operation systems to ensure that power system security is maintained through security constrained dispatch.

Powerlink will continue to monitor the level of constraints that occur on the transmission network and will investigate whether net market benefits will result from relieving intra and inter connector congestion through the RIT-T process.

Question 9

Taking a look at the historical increase in 50POE peak demand, you said that it was attributed to the gas load – can you estimate what fraction is due to the gas load?

The growth in Coal Seam Gas (CSG) loads contributed approximately 60% of the growth between the 2013/14 and 2017/18 transmission delivered demands.

Question 10

Can you provide more detail please about the two Renewable Energy Zones (REZ) 5 and 6 in Qld? Is Powerlink working on options/solutions to connect the VRE?

The 2018 ISP identified Fitzroy (REZ 5) and Darling Downs (REZ 6) as immediately optimal REZ development areas supported by existing capacity and system strength. Powerlink does not discriminate and will work with proponents interested in connecting generation in these and other areas.

Question 11

The Integrated System Plan (ISP) indicated that +100MW in north Queensland could see loss factors at -35%. Does Powerlink have a view on loss factors?

AEMO is responsible for the methodology and calculation of transmission loss factors (also known as marginal loss factors or MLFs).

In the example provided in the ISP (Figure 26) by AEMO, the generation vs MLF relationship was extrapolated to levels beyond thermal and steady state capabilities of the network. However, it served to illustrate the importance of MLFs when connecting to a remote part of the network.

Dispatch of an additional 100MW of generation in north Queensland will displace a similar amount of generation at various other locations in the NEM. The resulting MLF will be dependent on the network locations and changes in dispatch at various times through a year's profile.

Question 12

What consideration is being given to virtual storage opportunities?

Presently the volume of distributed battery storage is modest, but Powerlink is optimistic about the potential for aggregation platforms (i.e. virtual power plants) to enable such distributed energy resources (DER) to provide value for customers and provide cost-effective services to the grid. We are closely following developments in this area and monitoring the uptake of distributed battery storage.

A review of network operations capabilities has been undertaken to ensure that Powerlink is positioned to take advantage of new services as they become available at scale. The Energy Networks Association (ENA), of which Powerlink is a member, has been collaborating extensively with AEMO on the 'Open Energy Network' consultation, which is investigating how best to integrate such services.

Question 13

Will Powerlink publish the results of the congestion analysis?

Powerlink will publish any congestion analysis results relevant to the cost-benefit analysis undertaken as part of the RIT-T process.

Powerlink also publishes historical congestion data as part of its annual TAPR.

Question 14

Will all renewable energy run constrained lower output due to congestion and strict stability requirements arise from constrain equations? Will renewable projects lose commercial viability due to loss of revenue due to low output operation?

Like all generators, renewable generators are dispatched by AEMO in accordance with the National Electricity Rules arrangements. Existing and new generators of any type should ensure that they are aware of current and potential future network congestion in their investment and operating discussions. The responsibility to instruct generator dispatch lies with AEMO. Powerlink will continue to monitor congestion levels and will investigate whether net market benefits will result from relieving congestion through the RIT-T process.

Question 15

What role do you see for Concentrated Solar Power (Solar Thermal) in Queensland?

As a Transmission Network Service Provider (TNSP), Powerlink is technology neutral in providing a connection to the transmission network. Concentrated Solar Power (CSP) shows desirable characteristics including provision of inertia and system strength and storage of its own generated heat. At this stage no CSP generator has committed to connect to the Queensland transmission network.

Question 16

Why does Powerlink have a view about the marketability of renewable generators? Isn't that the role of generators – Is there a risk that Powerlink may focus on connecting generators and avoiding constraints at the expense of load customers?

Powerlink does not provide a view of marketability or profitability of generators. As suggested in the question, marketability is the concern of the generator proponent. Constraints are outcomes of future dispatches and are risks for the generation proponent to appropriately consider.

Powerlink has obligations under the National Electricity Rules to respond to all enquiries and applications to connect. Currently there are high levels of interest in connecting to the transmission network by renewable generators and Powerlink is meeting its obligations under the Rules.

Question 17

What's the likelihood of widespread extended outages in Queensland given other states' recent experiences?

A number of rules, guidelines and license conditions have been changed and updated following the South Australia system black incident. These changes have incorporated lessons and experiences from other regions in the National Energy Market and mitigate the risk of cascading power system issues. However, it should always be remembered that power systems are complex and operate in real time.