2020 Transmission Network Forum Summary

Powerlink hosted its annual Transmission Network Forum in September 2020. Due to the impacts of COVID-19, the forum was 'live' streamed to more than 250 customer, industry and government representatives across Queensland and interstate, where Powerlink's role in responding to the opportunities and challenges around the energy transition was discussed.

Virtual attendee numbers highlighted the importance of continued engagement with key stakeholders during these challenging times.

Powerlink's new Chief Executive Paul Simshauser delivered an insightful 'State of the Network' address looking at energy market prices, drivers and impacts, and what it potentially means for the industry in the future.

Insights were then shared by our Manager Revenue Reset, Matthew Myers, on key financial forecasts, engagement to-date and where feedback is being sought on Powerlink's 2023-27 Revenue Proposal process.

This was then followed by a brief presentation from the newly-appointed Executive General Manager Corporate Development, Kevin Kehl, who highlighted Powerlink's role in responding to network challenges including minimum demand, emerging limits on the power system, technical impacts and the broader market outlook.

Our expert panel participated in a robust Question & Answer session responding to questions focused on future power system planning and navigating the energy transition.

Our expert panel included:

- General Manager Network Regulation, Jennifer Harris
- Technical Solutions Manager, Geoff Burgess
- Team Leader Renewable Technology, Sachin Goyal

Expert panel 'hot button' issues

Jennifer Harris, General Manager Network Regulation:

"Trying to achieve the appropriate balance in our influencing activities both externally and normal course of business. It's trying to achieve an appropriate balance between meeting our regulatory obligations, facilitating our customer outcomes, and doing it all at a reasonable price."

Geoff Burges, Technical Solutions Manager:

"Getting customers through the Generator Performance Standards (GPS) process. If I had one piece of advice it would be ensure your submissions to the GPS process are well thought through and of good quality at the first step, as it can make an enormous difference on progressing through the process."

Sachin Goyal, Team Leader Renewable Technology:

"The power system is going through unprecedented change and two key factors are driving these changes in generation, including large scale renewable generation and roof top solar, and the lowest demand we have seen. These factors are posing several challenges for power system engineers in terms of operating a secure and reliable network."

Forum key Question & Answer themes

A number of questions were submitted throughout the event by virtual attendees, with key themes emerging, including:

Renewable Energy Zones (REZ) & allocation of Queensland Government funding

- Powerlink will be front and centre talking to Government for a significant share of the $500M, on top of the $145M funding already allocated for REZ development.
- Renewable energy will play a key role in helping drive the Queensland economy to recover from COVID-19, and this funding will strongly support that economic recovery.
- We are undertaking extensive planning to ensure the REZ investment best supports renewable generation and delivers value for Queenslanders.
- Funding will drive investment in our network to further support the state's renewable energy sector and help meet the 50% Renewable Energy Target (RET) by 2030.
- Decisions on what projects the funding will be allocated to sits with Government and will depend on the proposals put forward.
- Our new Corporate Development team is currently investigating a long-term model of the future of energy development in Queensland, considering what staging of potential load growth and load change scenarios and generation scenarios.

Addressing the challenges of system strength

- Powerlink has progressed significantly in terms of analysis undertaken and what we know about system strength impacts.
- There is a responsibility on Powerlink as a Transmission Network Service Provider (TNSP) to maintain a minimum level of system strength as defined by the Australian Energy Market Operator (AEMO), however new generators are required to bring their own system strength if an adverse impact is identified.
- Powerlink is working with AEMO to resolve the system strength gap identified in North Queensland.
- We're taking a collaborative approach working very closely with manufacturers across the industry to explain the system strength issues so they can improve their technology to help customers deliver their projects.

Facilitating new connections

- We committed at our 2019 forum to be more transparent with customers to help make the connection application process easier, around the Generator Performance Standards (GPS), and Full Impact Assessment (FIA).
- We now work with customers to define exactly what information is required to facilitate the FIA process and identify if a significant investment i.e. system strength solution, will be required for the project.
- Working very closely with manufacturers across the industry to provide feedback from customers to improve their technology to deliver projects.
- We are currently working with the Australian Renewable Energy Agency (ARENA) to investigate innovative solutions to address system strength issues through offering System Strength as a Service (SSaaS).
- ARENA investigations include looking at the role grid forming inverters could play as a potential solution.

Influence of the proposed CopperString project on Powerlink's Regulatory Proposal

- At this time (September 2020), the proposed private investment CopperString project will not form part of Powerlink's Regulatory Proposal.
- Considerations would need to be made should the project proceed, regarding impact it may have in bringing forward reinforcement or reinvestment on Powerlink's network.
- A Regulatory Investment Test for Transmission (RIT-T) would be required prior to any component of the project being transferred across to Powerlink's regulated asset base.

Customer and stakeholder influence on the 2023-27 Revenue Proposal

- Powerlink's co-design engagement approach has proven to be critical as it guided and informed the entire engagement process and made sure we concentrated on what was important to customers.
- Our Customer Panel and the Australian Energy Regulator's (AER) Consumer Challenge Panel encouraged the development of a draft Revenue Proposal. Powerlink adopted this approach, publishing this document at the end of September 2020.
- Customer feedback has influenced discussions around depreciation, step changes to operating expenditure, and Powerlink has made step changes based on customer feedback.
- Our pricing methodology and Preliminary Positions and Forecasts Paper have also been heavily influenced by customer feedback.

Selection of contingent projects

- We are expected to flag a variety of contingent projects within our Revenue Proposal, some which are based on load i.e. Galilee Basin, and some which have appeared in AEMO's Integrated System Plan (ISP).
- Powerlink wants to ensure that projects which appear in the ISP, which may be actioned within the next regulatory period or just outside the next regulatory period are identified to be transparent about what might eventuate.
- When it comes to contingent reinvestment projects, there may be a need to undertake a major reinvestment on a transmission line and we look at timing, need, and other options available. If there is uncertainty around a particular project, or potential other projects around that area, for example ISP projects, we a may consider those for contingent reinvestment

Question and Answers

A number of questions were submitted during the forum, and due to timing were unable to be answered. Powerlink made a commitment to attendees to provide follow-up responses to these questions.

Question: What are the principle nightmare scenarios for Powerlink, what would the impact be on Powerlink and how are these risks being managed within the Revenue Proposal?

Answer: There are a range of risks and benefits that we have had regard to in our draft Revenue Proposal. We have also summarised several key risks and benefits in the draft Revenue Proposal Overview. Key risks include being able to manage the consequential impacts of COVID-19 in the current and into the next regulatory period, and the challenge on our business to operate and maintain our network within a proposed operating expenditure target of no real growth.

We will ensure our Revenue Proposal, lodged with the Australian Energy Regulator (AER) in January 2021, represents what we need to provide safe, secure, reliable and cost-effective transmission services. We will manage unforeseen risks to the extent we can within our allowance, or we will access arrangements under the National Electricity Rules (e.g. cost pass through arrangements) in the regulatory period, if appropriate and necessary.

If for any reason we cannot continue to deliver safe, secure and reliable services within our target forecast, we will overspend our allowance. This will be a last resort for the business.

Question: The term "reasonable price" has been used during today's Forum. Please define "reasonable" and why the term "affordable" was not used instead?

Answer: Powerlink recognises affordability is a key concern for customers and that customers expect us to do what we can to ensure affordable services and value for money. The use of "reasonable price" is not intended to disregard a focus on affordability.

Our thinking in choosing the term "reasonable" was that the concept of "affordable" may differ between different customer groups. We adopted the term "reasonable" to reflect our view of the need to balance affordability with our obligation to deliver safe, secure, reliable transmission services.

We have highlighted our need to deliver customer affordability, and our approach to doing this in our draft Revenue Proposal.

Question: How much cross subsidisation between various classes of consumers currently exists, e.g. between solar and non-solar connected consumers?

Answer: Currently there is no cross subsidisation regarding utility scale solar connecting to the transmission network. Utility scale solar projects cover all costs associated with their connections to the transmission network.

Question: It is impossible to plan a transmission system if Powerlink/AEMO has limited visibility of potential new generation projects. Does local government inform Powerlink when a development application has been lodged and when the development application has been approved? Do Powerlink in turn report proposed new generation projects to AEMO? If so, at what point is the proposed new generation project reported to AEMO?

Answer: In Queensland, local government is not responsible for the planning approval of wind farms. This process is a state government activity under the Queensland Wind Farm Planning Code. The wind farm planning code provides a consistent approach to assessing wind farms across the state.

Developers of new generation projects are required during the project's development phase to discuss connection to the network with Powerlink as the Transmission Network Service Provider (TNSP), and we encourage this to occur as early as possible.

The National Electricity Rules requires a new generation developer to make an enquiry, then application, to the Network Service Provider (NSP), however both activities are initiated by the new generation developer. Like any other corporate entity, Powerlink can see dates published by local and state government, and other parties. However, we are not directly informed by local government of development applications at any stage.

AEMO is required to maintain a central register of connection applications and enquiries on its website. NSPs are required to inform AEMO to update the register. This register is updated quarterly and provides transparency about current connection activity.

Question: Powerlink has worked with key D&C contract partners for several years who have supported augmentation of the network and responded to challenging connection timeframes with excellent results. Is Powerlink considering to further leverage these relationships to assist Powerlink to respond to future opportunities such as developing the REZ concepts, reducing the new customer connection cycle times, and aiding Powerlink in growing its unregulated portfolio?

Answer: Powerlink and its D&C partners have worked collaboratively for many years to provide transmission solutions to meet the needs of our customers. Recently we have worked collaboratively on innovations to improve Powerlink's line reinvestment works. Our D&C partners are also heavily involved in the connection of renewable generators to our transmission network across the state. Powerlink will continue to partner in the development of REZs and continue work to simplify the connection of generator and load customers to the transmission network.

Question: Queensland has historically sent power from southern and central Queensland to the north - in a vertical skinny network. We are seeing some periods of the power flow shifting south and developments of generation and loads in the west of the state. What opportunities and challenges does Powerlink see for the changes in typical network flows and the future east-west network expansion?

Answer: The changing mix of generation is having a significant impact on power flows across Powerlink's major grid sections. Powerlink's 2020 TAPR (published 30 October) shows that the period of time the CQ-NQ grid section is reversing to a southerly direction is increasing. This changing flow pattern is introducing operational challenges in voltage control. Midday transfers are forecast to continue reducing with commissioning of additional capacity of variable renewable energy (VRE) generators and integration of additional rooftop-PV in North Queensland. Correspondingly, voltage control is forecast to become increasingly challenging for longer durations. The TAPR recommends the installation of a bus reactor to mitigate the risk of over voltages.

The TAPR also provides details of several proposals for large loads that may connect in the west of the state. The connection of new loads, such as the Galilee Basin and the connection of existing loads in the North West Mineral Province will require transmission network extensions to these remote locations. Such loads would have a positive impact on the minimum load issues emerging. This is particularly significant given the load profile for these mining, metal processing, and industrial loads are typically relatively flat.

However, during coincident NQ peak load conditions, the addition of these loads has the potential to significantly impact the performance of the shared transmission network and it may be economic to augment. The degree of impact is also dependent on the location and capacity of new or withdrawn generation in the Queensland region.

Question: With the last decade of reduced load growth and increased generator connections the expertise and resourcing has become very generator focused. How do NSPs influence, manage and prepare for future upward step changes in load or a sharp increase in load due to technology shifts which will necessitate shifting back to an energy delivery focus? E.g. CopperString would bring 400 MW of load connected in North Queensland. Electric vehicles could lead to large increases in load very quickly as would the processing and production facilities for battery technology and its associated components.

Answer: In discussions at the Transmission Forum our focus was on what we understood to be contemporary issues for our customers and communities – mainly around connecting renewable generators. Powerlink's future sustainability and investment decisions rely on the balance of supply and demand in a changing environment. Our addition of Demand Disruption goes to this point. We are involved in the CopperString project to ensure we understand and can support the connection of this load to the Queensland transmission network and the NEM.

We are also heavily involved in the Queensland Household Energy Survey with Energy Queensland and we separately monitor and assess the potential impacts of load and supply including electric vehicles, storage (both behind the meter and on the networks), rooftop PV trends, hydrogen production and the environments that our direct connect customers operate in. The Queensland Household Energy Survey Insights Report is available on our website and the Transmission Annual Planning Report also includes references to load or generation changes expected to impact on Powerlink's operations.

Question: For long term planning to address system strength issues, do you see more Battery Energy Storage Systems (with grid forming inverters) being used or will Open Cycle or Combines Cycle Gas Turbines be more economical?

Answer: Powerlink is technology neutral regarding system strength support and will select the most economical solution that maximises net benefits to the market.

Currently there is not any proven and commercially available grid forming inverter technology for use in an inter-connected network such as the NEM. Some trials are in progress that will hopefully remedy this situation.

The recently released Australian Energy Market Commission's (AEMC) Final Report Investigation into System Strength Frameworks in the NEM proposes the form of support be based on economic principles currently set out in the Rules.

Question: What is your opinion about asset transfers between PLQ and EQL networks? Do we need a joint team to work together on principles and plans on how to manage this very important aspect of our business?

Answer: Powerlink and the distribution entities (Ergon Energy and Energex) participate in annual joint planning with the objective of providing a safe, secure and reliable supply of electricity to our customers at the lowest cost irrespective of asset ownership. At this stage there is no apparent need or requirement for asset transfers between entities. If such a need is identified, the entities all being owned by a common shareholder, will follow the appropriate coordinated governance process.

Question: No mention of resilience to climate change? The Ergon distribution network has thousands of ground clearance issues which are cost and safety issues. What measures is Powerlink carrying out to increase its resilience, but not put cost on to consumers e.g. line sagging (fire) and strength and age of towers if cyclones move further south?

Answer: Transmission line clearances above ground and to vegetation are significantly greater than for distribution and sub-transmission circuits. Nevertheless, ground clearance deficiencies do occur, often for reasons that are beyond the control of Powerlink. Over the last 10 years, Powerlink has conducted a program of Aerial Laser Surveys (ALS) combined with sag modelling survey and modelling activities are carried out to identify potential ground clearance deficiencies and correct these where necessary. Corrections are prioritised by risk, and solutions are implemented in the most cost-effective way. Powerlink is also monitoring changes in Queensland's climate over time as this can impact our transmission line sag and line ratings. In many cases line ratings can be adjusted to ensure ground clearance requirements are met without a cost burden to customers.

Powerlink's current structure failure rate is very low, and many existing structures have already survived many high intensity cyclones, as well as microbursts associated with thunderstorms. We actively engage with external experts to assess the potential impacts of various category cyclones on our infrastructure. Ongoing monitoring of advice on the effects of climate change is occurring, and we are currently contributing to a review of AS1170.2 (Structural design actions - Wind actions), as this may impact tower design requirements in certain areas.

The need to balance cost with reliability and security is vital, as is the need to maintain the strength of structures over time. This is done through maintenance inspections, combined with refit activities and corrective maintenance to replace corroded bolts and members as required.

Question: What steps is Powerlink taking to help achieve an Open Electricity Network with a wholesale electricity two-sided market?

Answer: Powerlink is not undertaking any specific initiatives towards a two-sided wholesale market at this time. Through our membership of Energy Networks Australia (ENA) we are engaged in the work the Energy Security Board (ESB) is undertaking to develop a long-term, fit-for-purpose market framework that could apply from the mid-2020s (post-2025 Market Design). If there are aspects of this reform agenda that customers would like us to specifically address at this time, we welcome that input.

Question: Are investments to boost system strength a part of Revenue Proposal?

Answer: Our recently released draft Revenue Proposal discusses this topic. We have forecast a need for $17.8m in prescribed capital investment in the 2023-27 regulatory period on reactive power equipment to manage voltage levels.

Further system strength issues may arise during the 2023-27 regulatory period that could necessitate investment. These issues may need to be addressed through mechanisms such as cost pass through arrangements (refer Chapter 12 Pass Through Events in our draft Revenue Proposal).

Relevant capital investments will be subject to the AER's Regulatory Investment Test for Transmission (RIT-T)

Question: What is Powerlink's view of the proposed Financial Transmission Rights (FTR) structure? Does this proposed FTR structure shift the risk of network congestion to generators while this is currently shared between all market participants and network planners?

Answer: The AEMC is currently consulting on the Coordination of Generation and Transmission Investment (COGATI) reforms to ensure new generation and storage can connect to the power system in the right place and at the right time to meet future needs. The proposed transmission access reform involves the introduction of locational marginal pricing (LMP) and financial transmission rights (FTRs). LMP and FTRs are intended to provide signals, including better information and incentives to improve the location decisions of generators within the transmission network so it is better utilised, and give generators the ability to manage the risks relating to transmission congestion.

Changing the existing market arrangements represent a significant change to the NEM's design, including risks that market participants face. The COGATI reform and ESB market design have common elements and the AEMC has delayed its reform to ensure a workable solution is reached with the ESB. Powerlink's view is that any market redesign, including if an FTR regime is introduced, needs to demonstrate a net market benefits be pragmatic and workable, and appropriately manages risk that provides a foundation for future investment and development.

Question: Will Powerlink be working on a 100% dividend to Shareholders over the reset period?

Answer: Dividend setting arrangements are a matter for our shareholders, the Queensland Government. The dividends we are required to be pay are not a component of, or a factor that influences, our Revenue Proposal.

Reflecting the low level of growth investment Powerlink needs to make, we pay out 100% of our net profit after tax. That is subject to us maintaining a credit metric that is better than the BBB+ credit metric to make sure our business continues to be financially sustainable.

Question: To what extent have you started putting power lines underground to avoid bushfire threats to transformers and other vulnerable assets?

Answer: In Queensland, the incidence of fire starts from transmission circuits is very low, as a result of higher transmission circuit clearances, and vegetation management systems to maintain appropriate clearance around lines. While the cost of undergrounding 11kV distribution circuits is relatively low, undergrounding of high capacity 132kV, 275kV or 330kV circuits is extremely expensive, and accompanied by some disadvantages.

As risk can be managed by maintaining safe clearances around overhead transmission lines, undergrounding to manage bushfire threats has not yet been a cost-effective driver for any project.

Contact Us

Further information about Powerlink and our projects can be downloaded from www.powerlink.com.au

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