Powerlink Queensland

Submission to the Queensland Productivity Commission

Electricity Pricing Issues Paper

NOVEMBER 2015

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Contents

1 INTRODUCTION

The price of electricity continues to be a major challenge confronting the electricity supply industry, with all areas of the supply chain under pressure to reduce prices.

Powerlink Queensland recognises it has a key role to play in taking steps to place downward pressure on electricity prices. Powerlink has responded, and is continuing to respond, to this challenge by ensuring the business:

- is appropriately balancing cost to consumers with delivering reliable electricity transmission services
- is playing its part in placing downward pressure on electricity prices by delivering electricity services that are efficient and valued by customers and consumers.

Powerlink welcomes the opportunity to provide information to the Queensland Productivity Commission (QPC) to guide its thinking in making recommendations about how challenges facing the energy industry can be met. The following submission from Powerlink Queensland:

- builds understanding of Powerlink's role in the provision of energy, and the transmission component of electricity prices
- provides details about Powerlink's proposed Australian Energy Regulator (AER) Revenue Proposal approach, which demonstrates how Powerlink is responding to the challenge of placing downward pressure on electricity prices
- outlines Powerlink's commitment to consumer engagement and integration of consumer input to business decisions
- responds to questions raised by the QPC about the technological and policy challenges facing the electricity industry.

2 BACKGROUND

2.1 About Powerlink Queensland

Powerlink Queensland is a Government Owned Corporation (GOC) that owns, develops, operates and maintains the electricity transmission network in Queensland.

Our primary role is to provide a safe, cost effective and reliable transmission network to transport high voltage electricity generated at large power stations to the electricity distribution networks owned by Energex, Ergon Energy and Essential Energy in Northern New South Wales (NSW).

Powerlink also transports electricity to large industrial customers, such as rail companies, mines and mineral processing facilities that are directly connected to the transmission network.

Powerlink's transmission network runs approximately 1,700 kilometres from Cairns to NSW and includes more than 15,000 circuit kilometres of transmission lines and more than 130 high voltage substations (see Figure 1).

***Figure 1**: Powerlink's transmission network*

2.2 Regulatory framework

Powerlink is a Transmission Network Service Provider (TNSP) within the National Electricity Market (NEM). The NEM is the market for the wholesale buying and selling, and supply of electricity in Queensland, NSW, Victoria, South Australia, Australian Capital Territory, and Tasmania.

The prescribed electricity transmission services which Powerlink provides are regulated under the National Electricity Law (NEL) and National Electricity Rules (NER). Under these arrangements Powerlink is regulated by the AER, which is a constituent part of the Australian Competition and Consumer Commission (ACCC).

The Council of Australian Governments (COAG) established the COAG Energy Council which includes Energy and Resource Ministers from the Federal Government, and all States and Territories. The COAG Energy Council sets policy for the NEM and can issue directives to the Australian Energy Market Commission (AEMC).

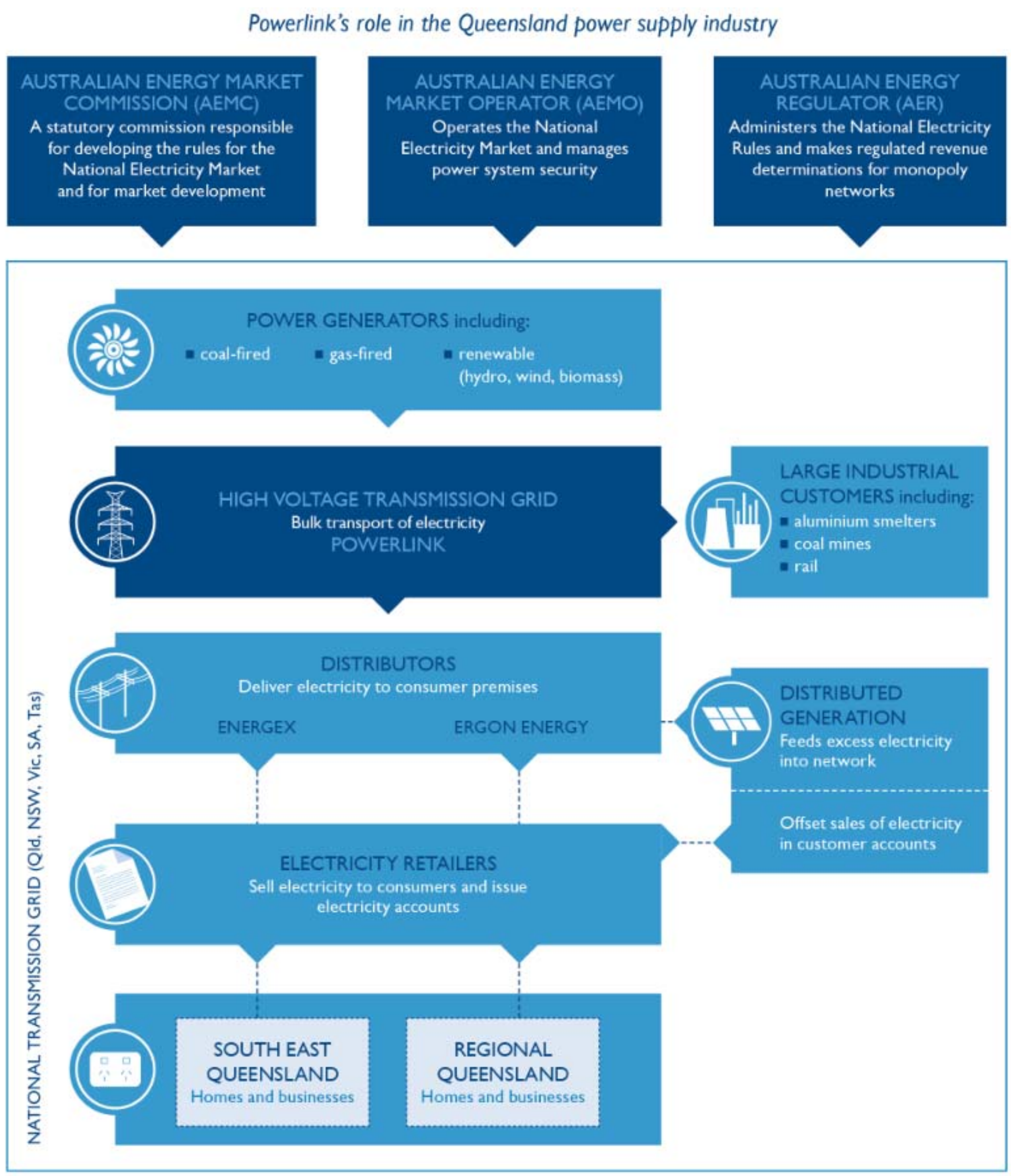

***Figure 2:** Powerlink's role in the Queensland power supply industry*

2.3 Transmission prices

Powerlink is mindful of its contribution toward the electricity bills of Queensland consumers and takes steps to ensure transmission services are delivered as cost-effectively as possible. Powerlink is focussed on providing input to proposed changes to regulatory and pricing frameworks, as well as boosting our efficiency and productivity in the long-term to help achieve the lowest possible power prices for Queensland businesses and consumers.

For a typical Queensland residential electricity consumer, the cost of electricity transmission makes up about 9% of the total delivered cost of electricity (see Figure 3).

Electricity supply chain component	Proportion of electricity bill
Power generators	21%
High voltage transmission	9%
Electricity distribution	39%
Electricity retailers	21%
Green schemes and solar	10%

Figure 3: *Electricity supply chain cost components based on a 2014/15 typical Queensland consumer electricity bill.*

Powerlink determines transmission prices by calculating Transmission Use of System (TUOS) and other charges, in accordance with methodologies set by the NER and the AER. There are a number of factors which may affect the transmission component of a consumer's electricity bill:

- wholesale price of electricity
- location of the consumer
- methodology used by retailers and distributors when passing through the cost of transmission to consumers.

Powerlink's five year AER revenue determination is a key factor in transmission pricing. The annual revenue amount which Powerlink collects for its regulated business (prescribed services) is determined by the AER through the revenue determination process.

The majority of Powerlink's grid revenues come from its prescribed network services, which are regulated by the AER. Revenue is essential to Powerlink's business so as to:

- operate and maintain the Queensland transmission network in a safe and reliable manner
- replace aging assets that have reached the end of their life
- develop the transmission network at the appropriate time needed in accordance with Powerlink's obligations to meet reliability standards set out in the NER, the *Electricity Act 1994*, and Powerlink's Transmission Authority, at the lowest long-run cost to consumers.

2.4 Upcoming revenue determination and transmission price path

Powerlink's approach to its upcoming Revenue Proposal for the 2018-2022 regulatory period is to deliver better value to our customers and consumers, with a focus on efficiency and cost reduction, while continuing to provide reliable transmission services. Powerlink's forecast expenditure requirements will be less in the next regulatory period (2018-2022) due to:

- virtually no requirement for augmentation (load-driven) capital expenditure which has been driven by a flat electricity demand outlook (see Section 2.5 and 2.6)
- operating expenditure requirements for the regulated network will be reduced as a result of ongoing efficiency initiatives (see Section 2.7)
- the cost of capital is expected to be substantially lower than it has been in previous years due to a lower cost of debt and equity.

Powerlink has engaged extensively with stakeholders in various panel discussions and customer forums that provided valuable face-to-face opportunities to inform our decision making.

Preliminary forecasts of Powerlink's proposal for regulated revenue point to around a 30% reduction in indicative transmission prices[1] in the first year of the next regulatory period. Based on the current forecast of energy use, indicative transmission prices over the balance of the regulatory period out to 2022 are expected to remain within CPI growth.

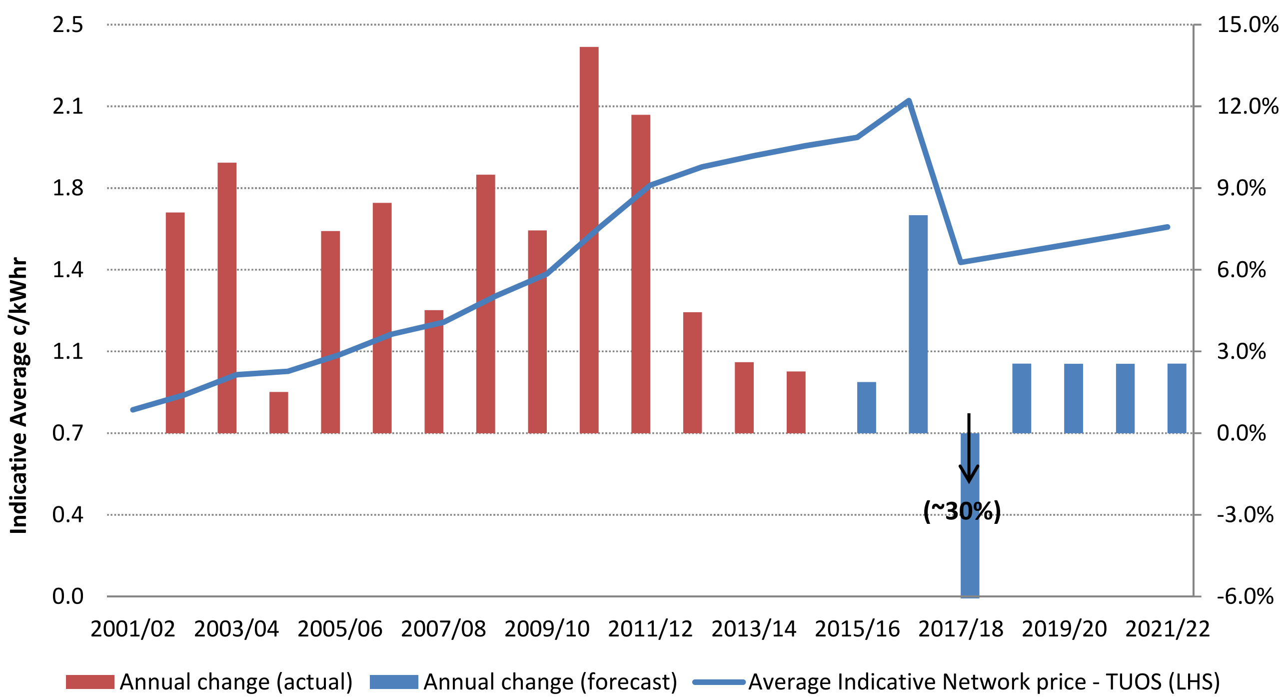

***Figure 4:** Powerlink nominal average transmission price (as at November 2015)*

[1] *Indicative transmission prices each year are calculated as revenue for regulated (or prescribed) transmission services divided by energy.*

Transmission charges comprise approximately 9% of an average residential household's electricity bill each year. The impact of Powerlink's Revenue Proposal on residential electricity consumers each year will depend on a number of factors, including:

- the proportion of annual prescribed revenue to be recovered from the Distribution Network Service Providers (DNSPs), Energex and Ergon Energy
- the particular tariff arrangements applied by the DNSPs and retailers
- the individual customer's electricity usage.

For a residential electricity consumer, Powerlink's Revenue Proposal is expected to reduce the average electricity bill by about 2.5% in the first year. On the basis of assumed tariffs and consumption, this presents an estimated saving of between $15[2] and $40[3].

[2] **Residential Flat:** single rate residential tariff is based on 4100 kilowatt hours (kWh) peak consumption per year.

[3] **Residential Time of Use:** time-of-use residential tariff is based on 2150 kWh peak, 5950 kWh shoulder and 2900 kWh off-peak consumption per year.

2.5 Demand and energy forecasts

Demand and energy forecasting is a key component in achieving the outcome of downward pressure on electricity prices while maintaining reliability of supply. It is used in determining future capital expenditure.

Since 1987/88, electricity demand has grown steadily (see Figure 5), requiring a strong program of transmission network development. However, in the years following the Global Financial Crisis (GFC), business and household demand dropped for a range of reasons including changes in consumer behaviour, uptake of solar photovoltaic (PV), technology changes and general economic conditions.

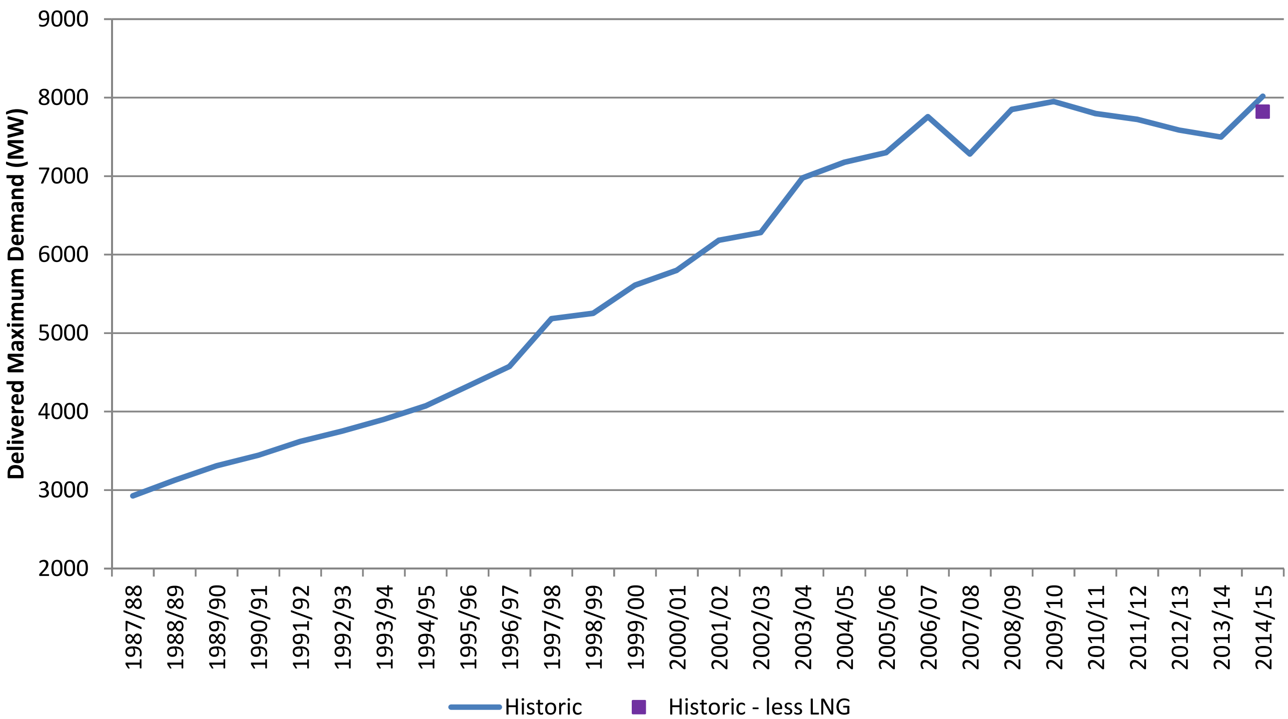

Figure 5: *Historic electricity demand growth over time (1987/88 to 2014/15)*

Powerlink looks at two major components when developing its forecasts – demand (instantaneous electricity usage) and energy (electricity usage over a full year). Our forecasting model takes into account:

- input from Powerlink's Demand and Energy Forecasting Forum
- information about resource sector investment
- external advice on likely economic conditions
- uptake of solar PV installations on homes and businesses
- impact of increased electricity prices (e.g. changed consumer behaviour) and energy efficiency initiatives
- adjustments to capture the effect of temperature and weather on demand and energy
- new technologies such as battery storage and electric vehicles.

Demand forecasting has been particularly difficult for a number of years, driven by uncertainty in economic conditions and also the rapid pace of changes in consumer behaviour and emerging technology.

Powerlink has made significant improvements to its forecasting approach over the past few years, including updating its forecast more frequently. Details about these enhancements can be found in Powerlink's 2012 to 2015 Transmission Annual Planning Reports (TAPR – referred to as Annual Planning Reports for the years 2012 and 2013)[4].

In 2015, to further improve our forecasting methodology, Powerlink engaged with a wide range of experts from companies such as Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian Energy Market Operator (AEMO), Energex, Ergon Energy, the Queensland Government, EY and senior independent specialists, and made the following additional enhancements:

- improved monitoring of the impact of solar PV on demand and energy – Powerlink has recently become a member of the Australian PV Institute which supplies real-time data for solar PV. This new information significantly enhanced Powerlink's ability to analyse a range of PV effects and, in particular, its impact on peak demand
- explicitly incorporating the forecast impact for other new technologies including battery storage, electric vehicles, energy efficiency improvements and tariff reform.

Powerlink also published its demand and energy forecast on the Powerlink website so interested parties could analyse the assumptions made, allowing them to replace them with their own assumptions to enable sensitivity studies to be performed. Powerlink's most recent forecasts show that, in the summer of 2014-15, actual maximum demand delivered for Queensland was around 1% above the previous peak in 2009-10 (see Figure 6).

Powerlink now forecasts that, excluding the ramp-up in demand associated with supply upstream Liquefied Natural Gas (LNG) processing facilities in the western Darling Downs and Surat regions, underlying demand growth is relatively flat over the next 10 years. Underlying energy use has also moderated since 2009 (see Figure 7).

It is important to note LNG growth has not driven a significant investment in the regulated (prescribed) network which is paid by electricity consumers. The majority of LNG related network investments are non-regulated with all costs associated with acquiring easements, constructing and operating the non-regulated network paid for by the LNG customer via commercial charges over the life of the agreement with the customer, not by Queensland consumers.

[4] *Powerlink's TAPRs/APRs are available at https://www.powerlink.com.au/About_Powerlink/Publications/Transmission_Annual_Planning_Reports.aspx or by contacting Powerlink directly*

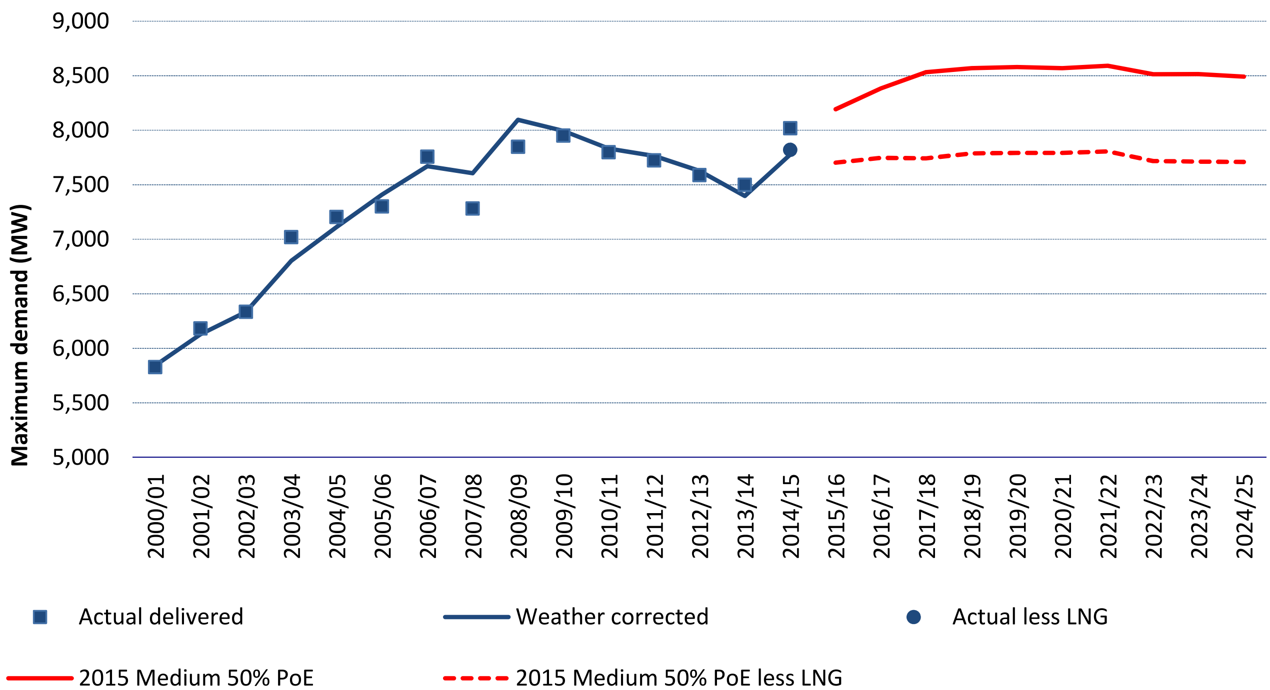

***Figure 6:** TAPR 2015 forecast Queensland region 50% Probability of Exceedence (PoE) summer peak delivered demand for the medium economic outlook*

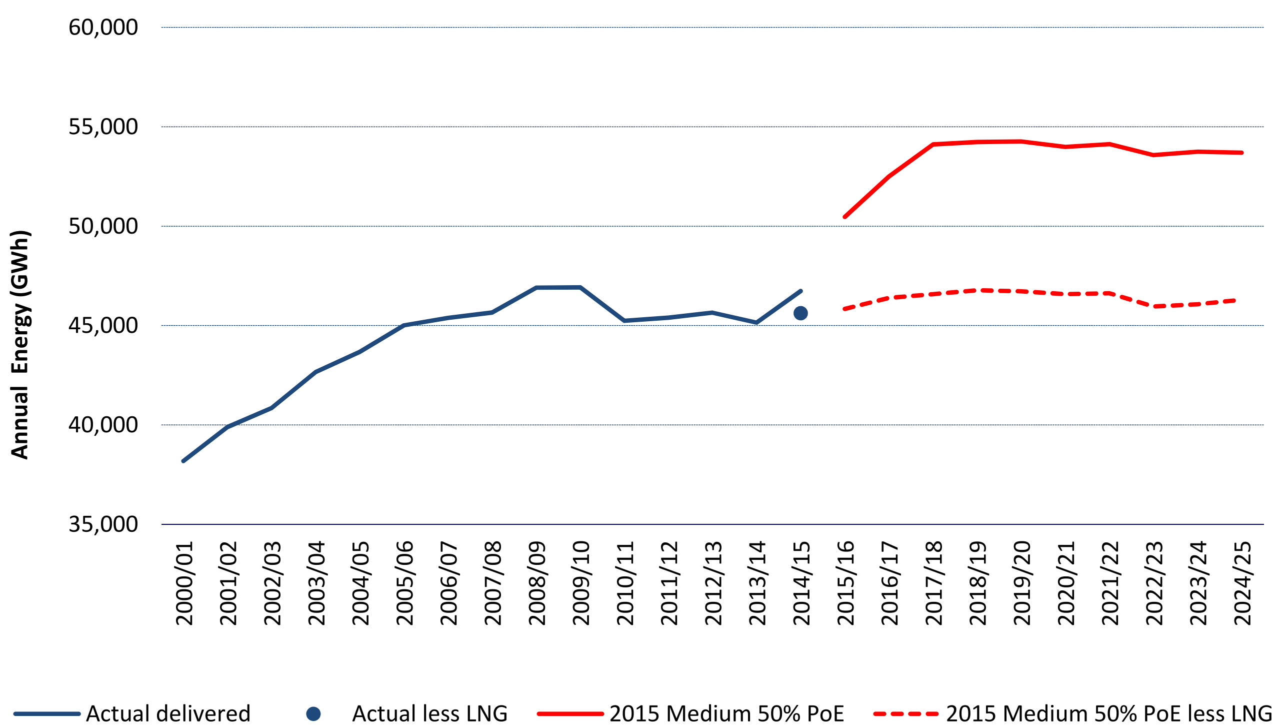

***Figure 7:** TAPR 2015 forecast Queensland region delivered energy for the medium economic outlook*

2.6 Capital efficiency

Powerlink's capital expenditure comprises demand driven and non-demand driven components. Demand driven capital expenditure includes augmentations, connections to the distribution networks, easements and land acquisitions. Non-demand driven capital expenditure includes reinvestment, security and compliance and non-network expenditure.

Demand driven capital expenditure is intrinsically linked to reliability criteria and demand forecasts. Powerlink regularly reviews the program of capital works and, where appropriate, defers capital investments to an appropriate time to ensure the right balance is struck between cost, efficiency and risk. For the current regulatory period (2013-2017), Powerlink's regulated capital expenditure is forecast to be approximately $1.4 billion (around 50%) lower than the current AER's regulatory allowance.

The reasons for this reduction are both external and internal to Powerlink. The demand forecasts at the time of the previous revenue determination were significantly higher than in subsequent years, due to very different economic conditions and forecasts at the time. Powerlink responded to these changes proactively through enhancements to its demand forecasting processes (see Section 2.5).

Powerlink did not, and has not, made investments simply because the regulatory allowance was provided. The reduced demand forecast, coupled with changed Powerlink assessment practices, has resulted in lower investment.

In addition, Powerlink has changed its approach regarding how to appropriately meet the demands on its network not only during this regulatory period, but into the future. Among other things, this has involved more detailed investigation into the utilisation, condition and management of existing assets. In practical terms, this has resulted in materially less capital expenditure in the period.

Powerlink's forecast capital expenditure indicates an approximately 25% further reduction for the 2018-2022 regulatory period compared to the 2013-2017 regulatory period. Figure 8 demonstrates the significant shift in capital expenditure over the last two regulatory periods (since 2008) and into the future.

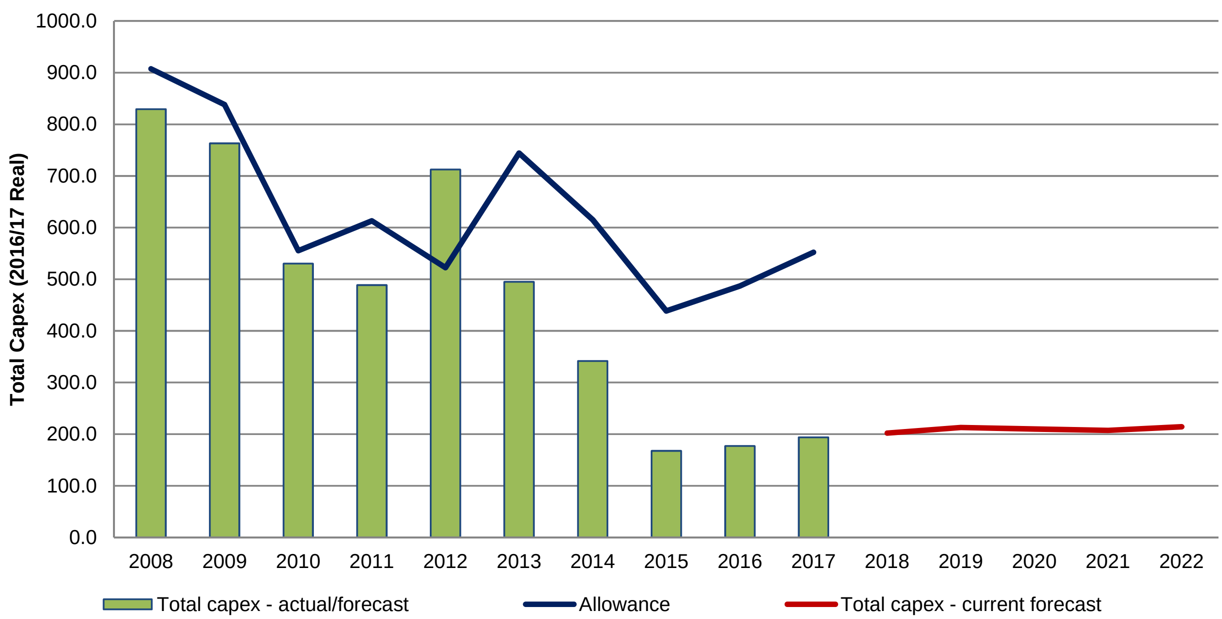

Figure 8: *Powerlink total regulated capital expenditure profile (2008-2022)*

Asset reinvestment focus

Non-demand, asset reinvestment capital expenditure is needed to manage the emerging risks related to Powerlink's ageing infrastructure. The Queensland transmission network experienced significant growth in the period from the 1960s to the 1980s and assets are reaching the end of technical or economic life.

Non-demand driven capital expenditure now represents the majority of Powerlink's current and future program of work. To ensure efficient network reinvestment, Powerlink has systematically assessed the enduring need for assets at the end of their technical or economic life and considered a broad range of options including:

- network reconfiguration
- asset retirement
- replacement with an asset of lower capacity.

Powerlink is also focused on enhancing our engagement process with non-network solution providers, having established a register of interested parties to allow for earlier engagement on non-network alternatives where possible.

These demand and non-demand driven capital expenditure efficiency initiatives are a key part of how Powerlink is contributing to placing downward pressure on electricity prices.

2.7 Operational efficiency

Powerlink's business is transitioning from a period of extended growth to a period of flat underlying electricity demand and a significantly reduced future workload. This has led to increased focus on ensuring that the business operates efficiently. Some of the key steps taken to improve Powerlink's overall efficiency include:

- restructuring the business in a way that maximises accountability and performance and
- aligning organisational resources and capability with forecast business requirements.

Powerlink is continuing to identify where it can improve its operations, including where there may be opportunities to enhance work practices, reduce duplication and benchmark costs as part of ongoing good business practice.

Powerlink's current forecast operational expenditure indicates an approximate 5% reduction for the 2018-2022 regulatory period compared to the current 2013-2017 regulatory period, as shown in Figure 9.

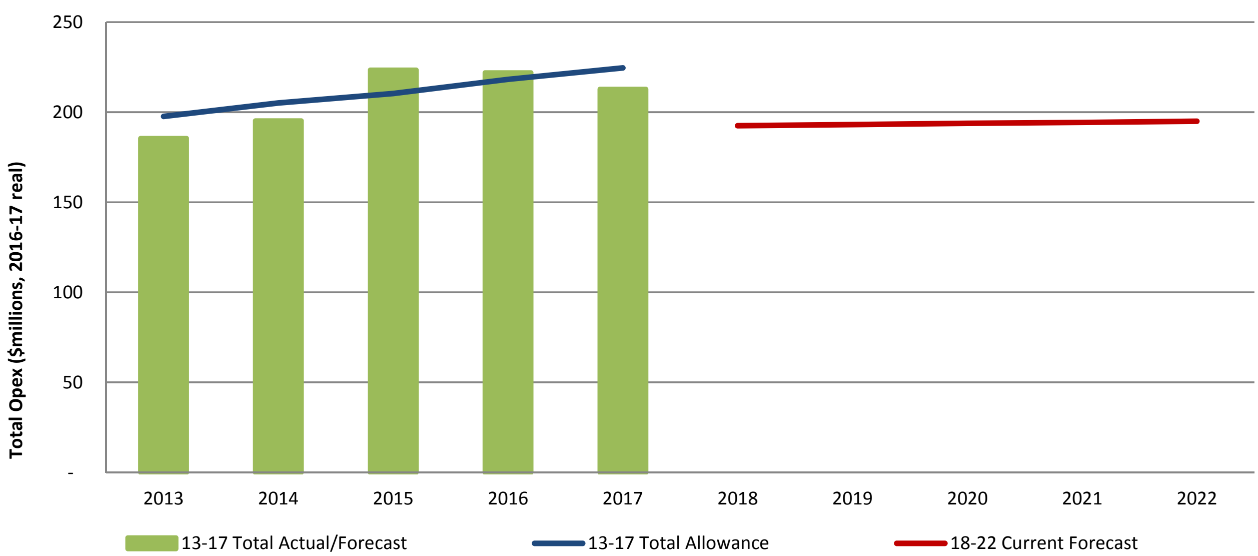

Figure 9: *Powerlink total operational expenditure (2013-2022)*

2.8 Consumer and stakeholder engagement

Powerlink's Stakeholder Engagement Framework and approach recognises the importance of effective and authentic engagement to ensure our services are valued by shareholders, consumers, customers and the market.

Powerlink has undertaken extensive research, both internally and externally to identify which aspects would add most value to engagement discussions. In response to this research, Powerlink's key consumer engagement activities include:

Powerlink Customer and Consumer Panel

Powerlink established its Customer and Consumer Panel with a representative membership of directly-connected customers, consumer advocates and industry representatives. The panel meets on a quarterly basis to provide a face-to-face forum for stakeholders to provide their input into our decision making processes and methodologies. It also provides Powerlink with another avenue to keep our stakeholders better informed about operational and strategic topics of relevance.

Demand and Energy Forecasting Forum

In March 2015, Powerlink hosted a Demand and Energy Forecasting Forum with experts from a wide range of industries to learn more about new technologies and the impacts they may have on future electrical demand and energy. As a result of this forum several enhancements were made to the forecasting methodology in the 2015 TAPR, including more explicit analysis of emerging technologies.

Transmission Network Forum

In July 2015, Powerlink held its annual Transmission Network Forum to discuss the future of Queensland's transmission network. The forum commenced with a presentation on Powerlink's TAPR, followed by concurrent interactive breakout sessions on Powerlink's AER Revenue Proposal, optimising the long-term planning of the transmission network and the impact of technology on demand and energy forecasts.

Area plan forums

One of the key findings of Powerlink's research was that stakeholders wanted more information and involvement in future network planning and investment decisions. In response, Powerlink has developed a strategy to host Area Plan Forums to allow stakeholder involvement in network planning decisions.

In 2015, stakeholders were invited to provide input on the Greater Brisbane and Central Queensland to Southern Queensland Area Plans. The focus of these forums involved Powerlink's approach to optimising asset reinvestment decisions in these areas, including options such as network reconfiguration and asset retirement.

2.9 Benchmarking

In 2014 the AER published its new annual benchmarking reports for electricity transmission and distribution network service providers. The purpose of these reports is to inform the AER and other stakeholders of the relative efficiency of the businesses over time and for input to the AER's regulatory determination processes.

Powerlink recognises the importance of benchmarking and supports the development and application of a robust benchmarking framework. However, at this time, Powerlink remains concerned that there are a number of areas where the data prepared by each of the TNSPs is not like-for-like as TNSPs have interpreted the AER's Regulatory Information Notice (RIN) requirements differently.

These issues have been raised in several submissions to the AER in relation to its 2014 and draft 2015 Benchmarking Reports for Transmission (see Appendix A: Powerlink AER 2015 Draft Annual Benchmarking Report Submission).

In terms of productivity, the QPC refers to Powerlink's performance between 2010 and 2013 in its Issues Paper. This reference is to the AER's measure of Multilateral Total Factor Productivity (MTFP). The MTFP is a ratio of the annual input of capital and operating expenditure (with physical measures of the size and capacity of a transmission network used as a proxy for capital expenditure) against a basket of outputs delivered to network users (including energy consumption, maximum demand, circuit kilometres of transmission line, voltage weighted entry/exit points and reliability).

In both its 2014 TransGrid Transmission Determination and Draft 2015 Annual Benchmarking Report for Transmission, the AER emphasised that it is not particularly confident in the specification used for the MTFP[5] and that caution should be exercised when interpreting the MTFP results. As with any type of benchmarking, it is important to recognise that there are a very small number of TNSPs under comparison (five) and each operates in a different environment. Notwithstanding these limitations, Powerlink acknowledges that its MTFP performance has still fallen between 2010 and 2013.

Since the early 2000s, Powerlink made significant capital investments to augment its network in response to demand growth, which increased the annual input of capital captured in the MTFP. Outturn demand and energy consumption in more recent years has not increased in line with forecasts and hence outputs measured by the MTFP have not increased in proportion to the capital inputs. This has resulted in Powerlink's MTFP score reducing in recent years.

While most other TNSPs also experienced significant increase in capital inputs over this period, Powerlink's performance was exacerbated by the long distances from where generation is located to where the load growth was experienced, which his characteristic of the Queensland geography. This required greater capital investment than if the same requirement for network capacity could have been over shorter distances. In essence, the AER's MTFP measure does not fully account for differences in operating environment.

Powerlink expects its performance under the MTFP to improve over the longer term with reduced forecast capital expenditure and increases in demand and energy consumptions due to the ramp-up of LNG production in the Surat Basin.

[5] *MTFP uses an annual user cost of the regulated asset base, which includes both a return on and of capital investments.*

In developing its 2014 Annual Benchmarking Report for transmission, the AER also commissioned Economic Insights to analyse the relative productivity of operating expenditure for transmission network service providers. Economic Insights developed an Operating Expenditure Partial Factor Productivity (PFP) indicator, shown below, that assessed the efficiency of total operating expenditure in delivering the same outputs previously discussed.

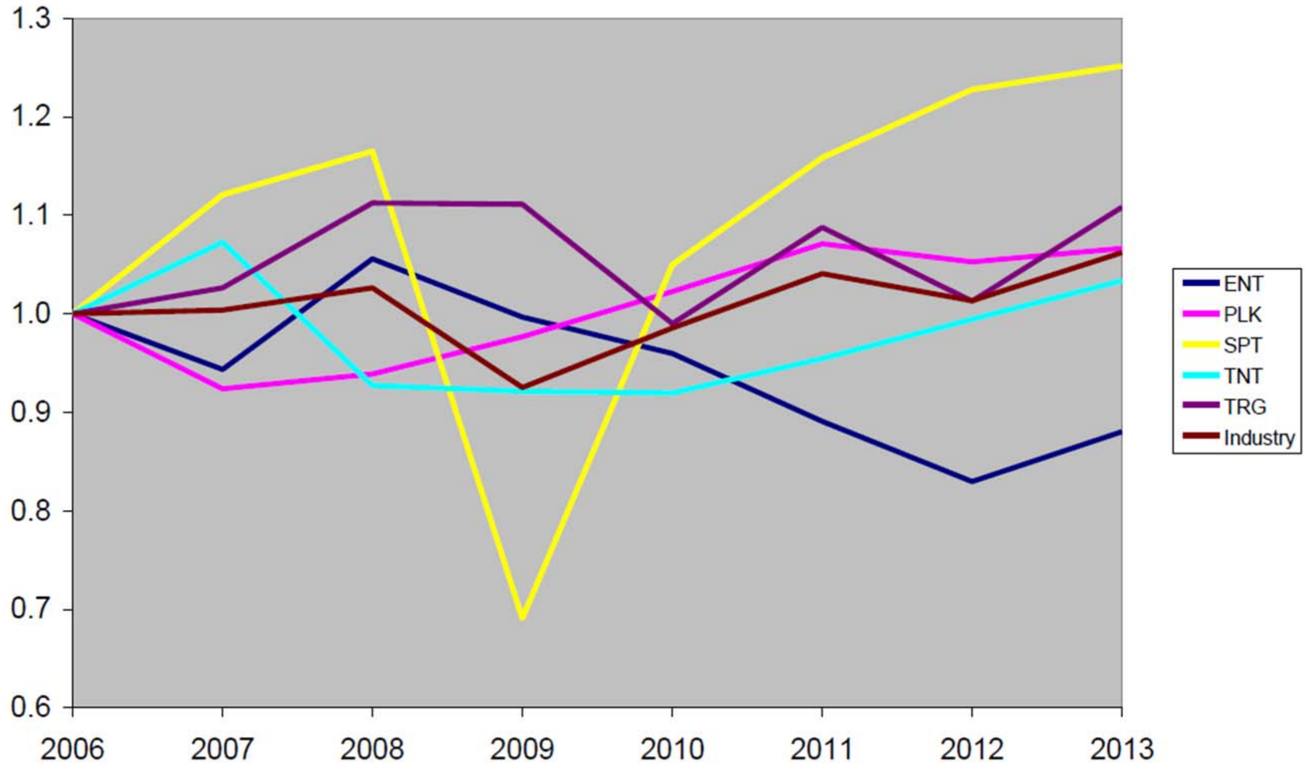

Figure 10: *TNSP opex partial factor productivity indexes (2006-2013).*
Source: *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs, Economic Insights, November 2014.*

The AER's analysis revealed that at an industry level, operating expenditure productivity had been increasing at an average rate of 0.86% per annum. Powerlink's average annual operating expenditure productivity was calculated to be 0.92%. With respect to operating expenditure productivity, Powerlink's performance has therefore been comparable to other TNSPs and in line with the industry average.

Powerlink expects that its continued focus on efficiency and cost reduction, as reflected in the forecast operating expenditure (see Section 2.7), will assist in preserving and improving Powerlink's operating expenditure productivity.

3 PRODUCTIVITY IN THE ELECTRICITY SUPPLY CHAIN

3.1 Driving productivity

The primary role of transmission networks is to supply bulk supply electricity from remote large scale generation to load centres. Transmission networks therefore play a key enabling role in facilitating competition in the market between different types of generation.

The energy market is undergoing significant change that is impacting all sectors of the industry. Within this context, transmission is expected to continue to play this important 'back-bone' role. However, a key difference is that the market is increasingly seeing the replacement of large scale conventional generation (such as coal-fired plants) with more renewable generation and increased distributed generation.

The QPC should ensure that its recommendations to improve productivity do not result in unintended consequences that would potentially hinder Powerlink's ability to continue to enable competition. In the current low demand environment it is even more important to improve the utilisation and efficiency of existing infrastructure and adapt regulatory frameworks to allow service providers the flexibility to be more creative and innovative in responding to changing consumer demands.

Powerlink considers that the regulatory framework is fundamental to the market's ability to respond and adapt to the transformation ahead. This will require a change in the mindset of policy makers and Rule makers, and a movement away from traditional forms of network regulation in some areas to support increasing contestability and competition, with a view to enhancing productivity. In particular to:

- Reduce the level of regulation imposed upon the businesses. The more dynamic nature of the market and potential availability of grid substitutes suggest that traditional heavy-handed monopoly regulation may not be required. A more flexible and potentially lighter-handed approach to regulation may be more fit-for-purpose that builds on some of the more future-ready elements of the framework, such as incentive-based mechanisms.
- Ensure no additional (unnecessary) regulation is imposed. In some sectors there is a presumption that as new and developing opportunities emerge, more regulation is required. Instead, a more efficient and proportional approach would be to identify whether in fact there is a market failure that would warrant additional regulation in the first place. It is also important that there be clear separation between the bodies responsible for deciding whether regulation is justified and the details of how it will be administered.
- Allow network businesses to enter new markets and compete where the environment provides effective or workable competition, not on the basis of network businesses receiving a regulated rate of return but on a competitive basis with appropriate ring fencing. The need to encourage such an environment was also considered as part of the recent Harper Competition Policy Review. In particular, getting the policy settings "right" was considered to be an important means to promote innovation, investment and creativity for new entrants as well as incumbents, in the interests of consumers.

Further information on potential changes to the regulatory framework is provided in Section 4.4.

3.2 Renewable energy

There are many benefits associated with the Queensland Government's renewable energy plans as they will help reduce Queensland's carbon footprint and generate new jobs across the state. Whilst Queensland has one of the highest penetration rates of residential solar PV in the world, current rates of renewable production are:

- 3% of current energy provided by solar PV
- 1.5% of current energy supplied by hydro
- 1% of current energy supplied by bagasse

Queensland is the nation's leading producer of solar power, with 451,450 installations to September 2015. In fact if you combine the capacity of all the solar PV installations in Queensland the total generation capacity would represent the third largest generation source in the State.

Solar PV has changed the profile of electricity generated at major power stations and transported across the electricity transmission network over the course of a day. In 2010, peak demand occurred on hot summer days around 3pm. As solar PV is offsetting demand from the transmission system at that time the summer state peak demand in 2014/15 occurred late in the afternoon and by 2017/18 the peak is expected to move into early evening.

The effect of solar PV has reduced the duration of the state peak demand (see Figure 11). These combined impacts will make non-network solutions (e.g. demand management, location generation or storage), more viable given the energy requirements will be lower compared to energy requirements associated with a longer duration sustained peak demand such as was occurring in 2010.

Hence, coupling solar PV installations with storage (the right amount in the right locations) will provide benefits to electricity consumers by improving the utilisation of electricity infrastructure and reducing future pressure on electricity prices.

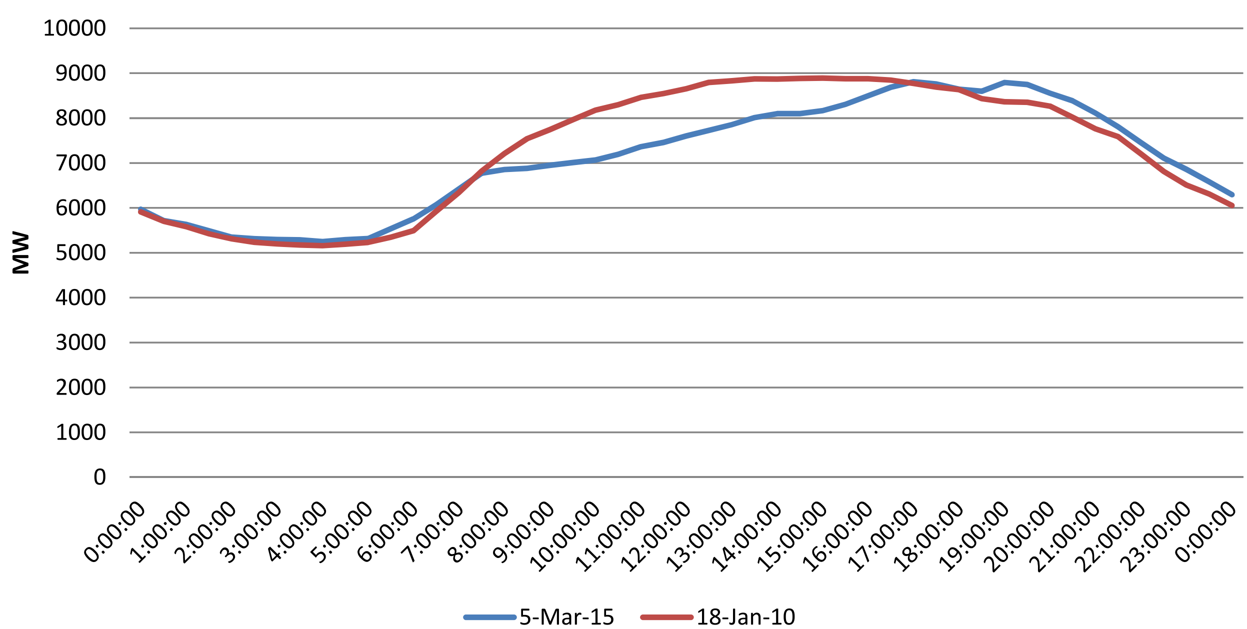

Figure 11: *Queensland demand (scheduled as generated)*

Considerations for the State Government's renewable target

To achieve the 50% renewable target a significant investment in a diverse portfolio of distributed and large scale renewable generation will be required – noting these could be located anywhere in the NEM. The renewable target should support market solutions, be outcomes focussed and technology neutral. That is, it should not favour distributed or large scale solutions but rather ones with the lowest long run cost to electricity consumers.

If the majority of the renewable target is met from distributed renewable generation there would continue to be a decline in energy delivered by the transmission network. In the short to medium term this would put upward pressure on the transmission component of electricity prices given the sunk cost in the existing network. Over the long term the size of the transmission network would reduce.

Alternatively in order to enable large-scale deployment of renewable generation from remote locations through to load centres hundreds of kilometres apart, a reliable and robust transmission network is essential. If large-scale renewable generation is located in areas with sufficient transmission capacity, this may result in downward pressure on electricity prices as more energy is being delivered by the transmission network, helping to improve utilisation.

It is likely that both distributed and large-scale renewables will be required in order to achieve the 50% renewables target. Therefore the transmission grid will play an important role in achieving the target. For example, given renewable generation is typically intermittent in nature and when relying on a large amount of renewable generation, diversity is important to reduce volatility in generation patterns. This diversity can be facilitated by the transmission network which can be used to connect new renewable generation across the State.

Consideration should also be given to expanding the role of energy storage and network interconnection with other states to maintain adequate generation during times of reduced output from renewable energy sources.

Similar to the Federal Government's Renewable Energy Target (RET) scheme any renewable target needs to consider potential step changes in energy consumption, both positive and negative. For example Boyne Island Smelter currently consumes 17% of the State's energy and could significantly impact Queensland energy consumption if its capacity is significantly ramped up or down.

4 NETWORK REFORM

4.1 Tariff structures and cost-reflective pricing

Transmission pricing arrangements

The current transmission pricing arrangements under the NER already encapsulate a number of key factors which have been adopted as part of the distribution tariff reform arrangements. These include cost reflective network pricing and demand based charges which signal utilisation of the network.

Under the Rules, transmission charges already send relatively strong cost reflective signals to directly connected customers, including Energex and Ergon Energy. Specifically, 50% of TUOS revenues are allocated using the specified cost reflective network pricing methodology and these service charges are demand based (nominated/contract demand and average demand).

Notwithstanding this and, in the interests of delivering better value to its customers, Powerlink has sought feedback from its customers and consumers on transmission pricing arrangements to inform its upcoming Revenue Proposal to the AER for the 2018-22 regulatory period.

It should be recognised that the impact of any changes to transmission pricing arrangements may be significantly different between customers who are directly connected to Powerlink's transmission network (less than 20 customers such as large loads or mines) and end users of electricity (i.e. residential consumers). The key reason for this is that prescribed transmission charges comprise:

- a large portion of a directly connected customer's electricity bill
- approximately 9% of an end user's (or consumer's) electricity bill and are not directly identifiable as they are subject to how they are incorporated into the distribution network tariffs.

In addition, the impact of these changes on prescribed transmission charges may also vary depending on the location of the particular connection and the individual customer's demands on the network.

Broader tariff reform

Powerlink supports network pricing arrangements that reflect the cost to supply electricity to customers and ultimately, consumers. Broadly, strategies and policies around tariff reform need to:

- work to smooth electricity usage at a level which will reduce the drivers associated with demand related capital expenditure, and improve network utilisation
- recognise the range of services delivered by the grid – many of which are not explicitly recognised but are essential to the ongoing delivery of electricity services
- reduce any unintended incentive to disconnect from the grid, particularly as many services provided by the grid are not currently recognised or explicitly included in tariff structures.

Tariff reform relates to changes in the way electricity distribution tariffs (rather than transmission charges) are established to provide clearer and cost reflective signals to consumers about their use of electricity networks. These signals are intended to incentivise consumers to reduce their consumption at times of peak and in doing so, increase overall network utilisation and reduce or avoid the need for additional investment in the networks.

Powerlink also cautions against further interventions to the way distribution tariffs are structured and applied, given that the DNSPs have only recently commenced processes to implement the newly established national framework.

These arrangements were developed after a lengthy period of consultation and need to be given time to apply and work. Powerlink understands that these new distribution tariffs are currently being assessed by the AER and will not apply until 2017.

As with any policy, tariff reform will result in 'winners and losers'. Those whose can respond to the new tariff arrangements and adapt their electricity consumption patterns will pay relatively less over time and those who cannot change their behaviour will pay more. While these outcomes should not prevent the adoption of tariff reform measures, Powerlink recognises that assistance to more vulnerable members of the community will be required.

While the need to meet peak demand is the primary driver of long-term network costs, currently tariffs are heavily based on the amount of electricity consumed (i.e. volumetric). This mismatch means there is a disconnect between the drivers for decision making by retailers and end users (which is based on volumetric tariffs) and the drivers for decision making by network businesses (which his based on meeting demand levels).

It would be appropriate to align the basis of tariffs which end users observe and pay with network investment drivers. Powerlink notes that recent changes to the NER for electricity distribution network pricing are a key means to affect such changes.

4.2 Falling average consumption

As Queensland moves to an evening network peak over the next two years, the addition of further solar PV will continue to reduce transmission network utilisation. After the next two years, more solar PV will do nothing to reduce peak demand whilst further reducing the energy delivered by the transmission network. The reduction of network utilisation will put upwards pressure on the transmission component of electricity prices.

The current volumetric tariff structure does not reflect the true cost of providing the electricity service. For example a house with solar PV running a large air-conditioning unit at the time of peak demand puts more stress on the transmission network, whilst at the same time paying less over the year, than a house without solar PV and a modest air-conditioning unit.

Tariffs that better reflect the true cost of providing electricity will help improve electricity infrastructure utilisation. This would provide incentives for consumers to make informed choices to manage their electricity use, without passing their costs onto other consumers. For example it may be more cost-effective for a household to be rewarded for reducing their demand at time of peak than investing in network infrastructure to address peak demand on a small number of hot days.

The introduction of battery storage over the next few years has great potential to help avoid network investment in areas which are experiencing growth in peak demand. In these areas storage will help improve electricity infrastructure utilisation and therefore put downward pressure on electricity prices. For example storage can help increase demand at the time of high solar PV generation and help manage peak demand in the evening after sunset.

The 2015 TAPR forecast flat underlying demand in part because it was assumed storage would reduce peak demand by 185 megawatts (MW) by 2025. The current tariffs do not provide the correct price signals to support the efficient uptake of storage. This is important to address as there is virtually no benefit to the networks from storage in areas of declining or flat peak demand.

4.3 Reliability standards

The current N-1-50 reliability standard, introduced in 2014, is intended to balance reliability and cost-efficiency and recognise consumer responses and concern in regard to electricity prices.

It is important for consumers and the State Government to be aware of the long-term nature of this strategy (e.g. the amended reliability standard will not result in immediate reductions to electricity prices, or immediate impacts on the performance of the network).

Should further amendments be considered, it is important that consumers are consulted and made fully aware of relevant considerations, such as the potential ramifications of low probability but high impact events, particularly at the transmission level of the supply chain where these events could cause widespread impacts.

4.4 New technologies

New technology has the potential to create positive downward pressure on electricity prices if integrated well with the existing infrastructure but can lead to outcomes that will increase electricity prices if a long-term strategic view is not taken.

Three technologies which are well advanced or expected to become mainstream' over the next ten years are solar PV, battery storage and electric vehicles.

Solar PV

The installed capacity of solar PV in Queensland is growing at a rate of approximately 20MW per month. While the residential installation rate is expected to decline as saturation effects begin, it is expected that commercial and industrial installations will make up the shortfall to maintain this rate over the foreseeable future.

Battery storage

Battery storage technology has the potential to significantly change the electricity supply industry. In recent years there has been significant reduction in the costs of battery storage and this is expected to continue resulting in the potential for significant battery storage to be installed over the next ten years.

Battery storage has many benefits including flattening electricity usage and thereby reducing the need to develop transmission and distribution networks to cover short duration peaks. By coupling battery storage with solar PV it will be possible to improve the utilisation of the networks and therefore place downward pressure on the transmission component of electricity prices.

Electric vehicles

Compared to world leading countries in electric vehicle uptake such as Norway and the Netherlands, the uptake of electric vehicles in Australia is currently low.

Ultimately, lower battery costs and improved performance will drive up sales in the long-term. In the event that there is a significant uptake in electric vehicles it will be important to encourage owners to charge their cars at off peak times resulting in an increase in energy consumption but with a minimal increase in peak demand.

This would result in downward pressure on the transmission component of electricity prices. If there was no incentive to charge the vehicles at off peak times, maximum demand as a result of electric vehicles may increase more than average demand. This would reduce network utilisation and, if investment could not be avoided through other means, put upwards pressure on electricity prices.

At the state level it is estimated a 1% penetration of electric vehicles on the road would result in approximately 0.3% increase in total energy usage. As such if electric vehicles are charged off peak the impacts on the transmission network will be relatively low. They may have higher impacts on the distribution network with off peak charging being particularly important as electric vehicle uptake in the first instance may not be uniform across the state.

Economic regulation

In the face of significant market change it is important that the regulatory framework is sufficiently flexible to accommodate the extent and pace of change. Powerlink is part of the ENA, which has considered some of the implications of energy market development on future economic regulation to ensure that it is fit-for-purpose. Industry considers that it is important that economic regulation:

- Allow networks to deliver valued, efficient energy services and solutions. This suggests that where it is appropriate to place greater reliance on competition and choice, the regulatory framework should facilitate such an outcome, not hinder it.
- Facilitate more efficient and collaborative approaches to setting network investment plans.
- Allow consumers to provide more input to regulatory decisions, which currently occurs through consumer engagement activities and new institutions designed to provide further consumer perspectives.
- Allow efficient competition to emerge and ensure that mechanisms exist to address where regulation can be removed or recalibrated. A more future ready framework should provide avenues to adopt lighter-handed forms of regulation or to allow competition to be truly effective.
- Provide robust, independent processes for evaluating the boundaries of competition and contestability.
- Enhance and promote network innovation. This could potentially occur through the adoption of new or strengthened incentives for innovation which allow both the businesses and consumers to share in the rewards or benefits over time. A range of mechanisms could be investigated which may include the establishment of innovation funds, innovation roll-out allowances. It should be recognised that the current regulatory framework includes an avenue for the AER to introduce small-scale incentive schemes.

Importantly, Powerlink seeks to ensure it can participate in the provision of services on a competitive basis, with appropriate ring-fencing or structural arrangements. Network businesses should not be excluded from such participation on a competitive basis and it is important that impediments to participating are not introduced through regulatory frameworks.

4.5 Network mergers

Powerlink is an active participant in the consolidation process being undertaken by the State Government. Regardless of the consolidation outcome, Powerlink is focused on delivering savings through cash flow reductions (e.g. lowering future capital expenditure and ongoing operational efficiencies).

Any structural reform discussion needs to consider whether changes will contribute to or detract from the ability to utilise Powerlink's current business or the broader transmission network to meet key State Government objectives such as:

- stabilising and reducing electricity prices
- lowering carbon emissions
- regional development and jobs
- encouraging private sector investment (e.g. in renewable generation).

5 REGULATION, GOVERNANCE AND POLICY

5.1 Governance and market operation reviews

Harmonisation of energy policy and laws

The recently released Final Report on the Review of Governance Arrangements in the NEM is an important reference for consideration of any harmonisation between State and Federal regulation.

The Final Report found that while current governance arrangements for Australian energy markets are fundamentally sound, there remains scope for improvement in a number of areas, especially given the unprecedented pace of change in the energy sector.

Powerlink considers there is a need for greater coordination across governing bodies with a view to providing a more nationally consistent and timely approach to the development and implementation of energy policy, reform and where appropriate, regulation. Grid Australia's submission[6] to the Review of Governance Arrangements in the NEM called for:

- a more strategic, coordinated and prioritised approach to energy policy and market reform
- greater transparency of the COAG Energy Council's areas of focus, priorities and progress of its work program
- the establishment of a more collaborative culture, focused toward a clear vision for the electricity supply sector
- more structured industry engagement by the COAG Energy Council and its working groups
- the opportunity for informed and representative industry views to be heard by Energy Ministers to provide insights to senior officials that could be included in COAG Energy Council meeting papers.

Powerlink and the transmission sector in general consider that if implemented appropriately, many of the measures recommended in the Final Report should improve the speed, efficiency and quality of energy policy development and energy market reform in the NEM.

The Final Report recommendations should also assist in minimising the potential for uncoordinated, duplicative and arguably unnecessary processes or outcomes to occur. A close examination of State-based regulation which may duplicate Federal regulatory requirements could also be worthwhile.

[6] *Grid Australia, Review of Governance Arrangements for Australian Energy Markets – Issues Paper, 4 May 2015*.

5.2 Queensland Government regulation

***Electricity Act 1994* and inter-jurisdictional energy law considerations**

Powerlink does not have any material concerns with the operation of the *Electricity Act 1994*. Powerlink has provided detailed advice to the Department of Energy and Water Supply (DEWS) regarding a number of areas within the *Electricity Act 1994* that may benefit from closer review and enhancement to improve clarity of application. These suggestions are outlined broadly below:

- ensuring alignment and consistency with recent changes to the NER for economic regulation of electricity transmission and distribution businesses
- streamlining initiatives to reduce the regulatory burden on energy GOCs in the area of project delivery, such as streamlining required environmental, access and acquisition approvals
- reviewing employment and industrial relations provisions outlined within the *Electricity Act 1994* to ensure any inconsistencies with recently amended Federal industrial relations laws and enterprise bargaining outcomes are addressed
- reviewing potential duplication between some elements of the *Electricity Act 1994* and other regulatory instruments applicable to electricity NSPs, for example in relation to superannuation.

Other legislative considerations

Streamlined regulatory and approvals processes are a critical component to ensuring Powerlink remains an efficient business. For example, approvals through the Community Infrastructure Designation (CID) process have led to efficient provision of new infrastructure.

It is important that ongoing legislative frameworks and policies are developed in a way that takes into account the unique nature of electricity infrastructure and the fact that legislative amendments which propose greater regulation and red tape may place upward pressure on electricity prices for consumers.

5.3 Demand management and energy efficiency incentives

Tariff reform and demand side management

Network tariff reforms are intended to influence consumer behaviour, and to shift energy usage away from peak times. The extent of the change in consumer behaviour will be heavily dependent on the proposed tariffs and the resulting consumer uptake. In addition to this maximum demand reduction, it is anticipated that network tariff reforms will also influence future use of battery storage technology, encouraging consumers to draw from the batteries during peak demand / high price times. The extent to which this occurs will depend on how quickly new tariffs are offered and the adoption rate.

> *In Australia and internationally there is evidence that customers will significantly reduce their demand in response to well-designed price signals that reward off-peak use and peak demand management. 60% of trials internationally have resulted in peak reductions of 10% or more.*[7]

Tariff reform, depending on the uptake, is likely to result in load shifting and as such the impact on energy is expected to be low. Tariff reform and demand side management should help improve the utilisation of electricity infrastructure and will put downward pressure on the transmission component of electricity prices.

Energy efficiency and advanced metering programs

Energy efficiency has benefits in reducing Greenhouse Gas (GSG) emissions and can assist to reduce individual consumers' electricity bills. To realise positive overall price outcomes from energy efficiency initiatives, it is important that energy efficiency is focussed on initiatives which will help reduce network peaks.

If this is achieved in areas where peak demand would have increased it will help improve electricity infrastructure utilisation. In the 2015 TAPR Powerlink forecasts assume 315MW and 100MW reductions in peak demand as a result of energy efficiency and demand side management and tariff reforms. **If utilisation is improved by reducing peak demand it will help put downward pressure on electricity prices.**

There is little overall price benefit to others if individuals improve their energy efficiency at off peak times, as it will contribute to lower network utilisation, which results in a higher network cost per unit of energy. This in turn will place upward pressure on electricity prices for consumers.

In terms of advanced metering, Powerlink supports the introduction of contemporary and cost-effective metering to assist in responding to cost-reflective electricity prices. Contemporary tariff structures will almost certainly require a high proportion of advanced metering technology to be successful.

Advanced meters have a cost associated with them which needs to be recovered by the benefit of installing them. They will also introduce new challenges, such as the potential requirement to replace them more frequently than less complex meters.

If demand management and energy efficiency measures are to succeed, a critical part of this success will be to raise consumer awareness and promote consumer uptake of these initiatives. Without widespread consumer adoption, benefits may be minimal.

[7] *Towards a National Approach to Electricity Network Tariff Reform (page 6) – ENA Position Paper December 2014*

6 CONSUMERS

6.1 Consumer involvement and education

Household energy behaviours have a profound impact on demand for future transmission services and consumer engagement must be a key part of all network business operations. Section 2.8 of this submission outlines the numerous initiatives Powerlink is undertaking to engage with consumers and the importance Powerlink places on consumer engagement.

In terms of consumer participation, the 2014 Queensland Household Energy Survey commissioned by Powerlink, Ergon Energy and Energex, indicates that concern about electricity bills is polarised, which has been a trend since 2010. About 40% have a high level of concern and a similar proportion are not very concerned.

There continues to be a gradual decline in Queenslanders reporting that they have actively changed their energy consumption behaviour in order to save money. About 18% state that they have not done so and this trend is expected to increase in the coming years.

In terms of education, it must be recognised that the energy industry is now a complex arrangement involving many steps in the supply chain and many potential parties. Based on Powerlink's previous consumer research, it is clear that consumers are not aware of all the parties involved and their respective roles and are not naturally motivated to understanding the market. Powerlink has focused on developing a range of communication tools to effectively communicate to consumers the often complex electricity supply industry, including:

- a three minute animation that visually explains Powerlink's role in the electricity supply chain, key operations and impact on Queensland electricity consumers
- a range of presentations and information sheets to help educate consumers, located on Powerlink's website
- ongoing engagement forums and discussions with consumer advocacy groups to raise understanding about Powerlink's functions in the supply chain and obtain feedback on elements of the supply chain which consumers can directly influence.

From a transmission perspective, the level of interest of consumers in responding to the various electricity supply chain segments should be taken into account in any broader consumer strategies which may be implemented.

6.2 Vulnerable consumers

Powerlink agrees it is important that vulnerable consumers are supported and considers a national review of government assistance, consistent with AEMC calls in a number of reports, may be warranted.

The review should consider the appropriateness, effectiveness and efficiency of energy assistance measures, and report to the COAG Energy Council. In this context, the review should include both financial assistance and measures to address the energy efficiency of low income households. It may also be possible to leverage existing schemes to extend the value of currently available assistance.

The national review would ideally include a dialogue between consumers, consumer advocates, energy sector, policymakers and governments to identify proposed policy options. The review should consider the roles of Commonwealth and state governments, jurisdictional regulators and industry participants including networks and retailers.

7 ABBREVIATIONS

ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CID	Community Infrastructure Designation
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEWS	Department of Energy and Water Supply
DNSP	Distribution Network Service Provider
GFC	Global Financial Crisis
GOC	Government Owned Corporation
GSG	Greenhouse Gas
LNG	Liquefied Natural Gas
MTFP	Multilateral Total Factor Productivity
MW	Megawatt
NEL	National Electricity Law
NEM	National Electricity Market
NSW	New South Wales
PoE	Probability of Exceedance
PV	Photovoltaic
QPC	Queensland Productivity Commission
RET	Renewable Energy Target
TAPR	Transmission Annual Planning Report
TNSP	Transmission Network Service Provider
TUOS	Transmission Use of System

8 APPENDIX A: POWERLINK AER 2015 DRAFT ANNUAL BENCHMARKING REPORT SUBMISSION

Refer to the PDF file attached to this submission.

2015