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Queensland Productivity Commission
PO Box 12112
George St QLD 4003

Dear Commissioner Wood,

In response to the Issues Paper on Electricity Pricing in Queensland released in October 2015 please find attached Sun Metals Corporation Pty Ltd submission to this process.

Sincerely,

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Sun Metals Corporation Pty Ltd
Submission to Queensland Productivity Commission
On Electricity Pricing in Queensland

Company Background

Sun Metals (SMC) is a state-of-the-art zinc refinery based in Townsville and directly employs about 300 workers and many more indirectly. Townsville Enterprise has estimated that the total economic output for which SMC is accountable is approximately \$1.24 billion per year in its current form. From its inception, SMC was designed to expand its capacity by 100%, and if expanded, SMC's total economic output is estimated to be \$2.05 billion per year.

SMC is a global leader in energy efficiency and labour productivity. Due to the nature of the zinc refining process using electrolysis, SMC is a large consumer of electricity, as it typically consumes 1,000,000 MWh of electricity per annum.

Due to this large usage of electricity SMC is keen to assist Queensland in delivering efficient and low cost energy into its economy. To help with this process we have provided the following input to the questions asked by the Queensland Productivity Commission.

Relevance to QPC Investigation

This document responds to the Queensland Productivity Commission Inquiry into electricity pricing.

This document is structured to respond to the individual questions raised in the consultation. There are specific comments on Q2.5, Q2.9, Q2.10 and Q4.11.

The SMC comments drive to the fundamental objectives of the inquiry and particularly:

1. a competitive electricity market;
2. productivity growth in the energy industry and among energy users;
3. appropriate reliability, safety and security of electricity supply;
4. efficient investment and operation of electricity infrastructure;

Generation / generator costs and transmission costs and how they are allocated is fundamental to achieving these objectives. The comments in this document address some fundamental issues with ensuring the most efficient generation is dispatched into the market and the pricing encourages and reflects this outcome.

Queensland wholesale electricity price has moved from being the lowest in the NEM up to 2011/12 to being the highest in the NEM in 2014/15. Given the fundamentals of the supply side and excess capacity have not changed that significantly in Queensland but there has been a concentration in control of the supply side trading of generation compared to other states – it seems reasonable to investigate the competitiveness and efficiency of the Queensland market. Market failure is highlighted in the responses in this document.

The comments on the allocation of transmission charges is based on a detailed understanding of the implications of the current transmission cost allocations under the Rules and determinations and how these are distorting investment outcomes for users and the impacts on equity across the State.

Generation

2.5 What factors are influencing higher wholesale prices in Queensland and do these represent systemic or transient market issues?

Systemic Market Issues increasing

During the 2014-2015 financial year, Queensland's wholesale price of electricity is now highest in the National Electricity Market (NEM) (Fig.1).

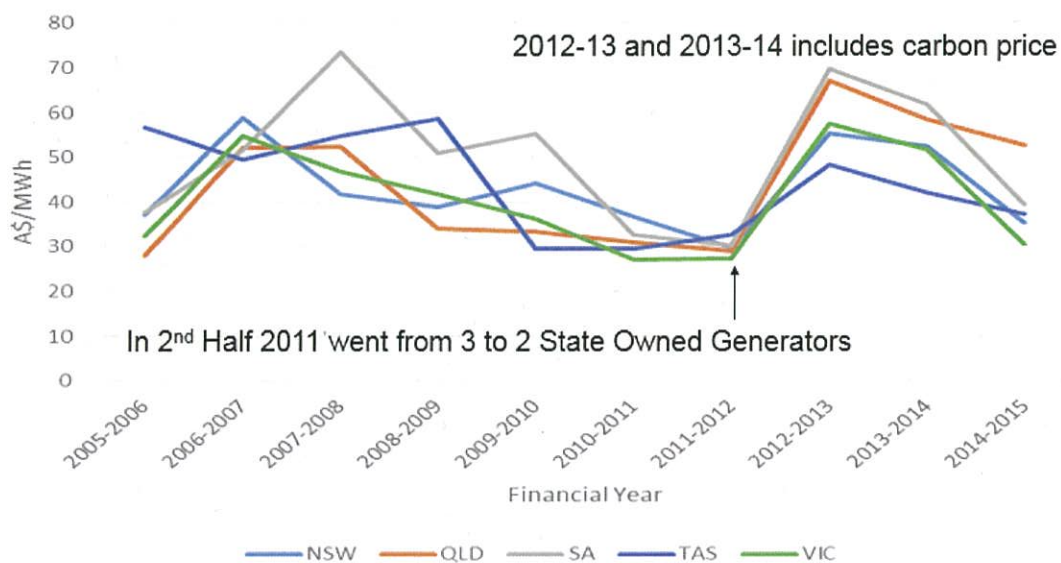


Fig. 1 Average Annual Wholesale Price of Electricity. Source: AEMO

Having the highest wholesale price in the NEM has been building for some time suggesting the problem is becoming systemic. Market structure and a lack of competition can be a contributing factor to high prices. It appears that this may be happening in Queensland particularly since the second half of 2011, when three State owned generators were amalgamated into two generators.

In the six years prior to the amalgamation Queensland consistently enjoyed wholesale electricity of either being the lowest or second lowest in the NEM. The only exception to this was the severe drought in 2007/2008 when the government instructed State owned generators to lower production to conserve water. In the year after the amalgamation and ever since Queensland pricing has been either the second highest or highest in the NEM (Fig1).

Further evidence of the influence of monopoly power is that generators are able to create these price increases in a market that is still oversupplied by 30% today.

Transient Issues Increasing Queensland's Wholesale Price

Transient power can also have a significant impact of Queensland wholesale pricing. The most recent example of this is 1Q 2015 where Queensland prices were almost three times higher than other NEM regions (Table 1).

NEM Region	QLD	NSW	VIC	SA	Tas
1Q 2015 Average Price A\$/MWh	\$91	\$34	\$27	\$36	\$39

Table 1. 1Q 2015 Average Wholesale Price of Electricity. Source: AEMO

(i) Transient Power during 1Q of 2015

If you look at the pool prices more closely you find that:

- In January 2015, the average pool price of Queensland was \$117.34/MWh.
- In March 2015, the average price was \$117.62/MWh.

Such high prices during these two months render the average price for 2015 1Q to be \$91/MWh

If we look a bit more closely out of the 2,160 hours in 1Q of 2015, there were 27.5 hours during which the pool price was above \$1,000/MWh. If you take the average of 1Q pool prices without these 27.5 hours, 1Q average pool price would be reduced from \$91/MWh to \$43/MWh. This is still higher than other states, but not as extreme as \$91/MWh.

This means that 27.5 hours out of 2,160 hours, 1.3% of the time, accounts for the average pool price increase by 112% for the quarter. This also means that the average pool price of these 27.5 hours was astounding \$3,818/MWh. The analysis highlights that these price extremes do not reflect the real cost of generation for those critical periods, but reflect excessive market power by the generators to set these prices in an oversupplied market.

The high price of electricity in 1Q 2015 was not because of an excessive increase in demand compared to other years, nor a severe decrease in availability of generation or any natural workings of a healthy market; it was what happened during these 27.5 hours in 1Q 2015 that drove the prices up for Q1 2015 and now has affected 2016 1Q forward prices too (Table 2)

	1Q 2014	1Q 2015	% Change 1Q 2014 vs 1Q 2015
Average Peak Generators Availability (MW)	10,407	9,805	6%
Average Peak Demand (MW)	6,665	7,052	6%
Average Surplus Demand (MW)	3,742	2,753	6%
Average Excess Supply over Demand	36%	28%	8%
Highest Peak Demand (MW)	8,365	8,808	5%
Queensland Wholesale Price (\$/MWh)	\$66	\$91	(39%)

Table 2. Comparing Peak Demand and Generation

Based on the Australian Energy Market Operations Price Events Reports¹ a large percentage of these 27.5 hours were driven by high demand amplified by generators rebidding strategy. It is normal in the NEM to see higher prices as demand increases, but taken collectively over these 27.5 hours this pricing is extreme. It is clear that the outcomes for 1Q 2015 is a market failure when peak demand (which only occurs for short periods), only moved by 5%, but prices increased by 39% compared to 1Q a year ago.

The outcomes for 1Q 2015 in Queensland is a market failure, when generation can exert this much power in an oversupplied market.

(ii) Transient Power in July and August of 2015?

There were six instances in July 2015, each instance lasting 30 minutes, when the wholesale electricity price was above \$2,000/MWh. The six instances were:

Date	Time	Price \$/MWh	Actual Generation	Available Generation	Actual Coal Generation	Available Coal Generation
13/07/2015	7:00 am	\$2,325	6,578	9,892	5,825	7,241
16/07/2015	7:00 am	\$2,400	6,723	10,049	5,593	6,797
17/07/2015	7:00 am	\$2,352	6,965	9,942	5,439	5,981
18/07/2015	10:30 pm	\$2,459	6,181	9,565	5,465	6,902
20/07/2015	7:00 am	\$2,337	6,315	9,925	5,524	6,707
29/07/2015	7:00 am	\$2,352	6,706	9,922	5,834	6,657

¹ <http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Pricing-Event-Reports>

There were two instances in August 2015, each instance lasting 30 minutes, when the wholesale electricity price was above \$2,000/MWh. The two instances were:

Date	Time	Price \$/MWh	Actual Generation	Available Generation	Actual Coal Generation	Available Coal Generation
05/08/2015	7:00 pm	\$4,847	7,045	9,497	5,492	6,062
20/08/2015	7:00 am	\$2,334	6,533	9,679	5,658	6,206

On its face, there is nothing strange about the aforementioned price spike instances, except all the morning spikes occurred at 7:00am. These were cold mornings, where the electricity demand in Queensland is sure to increase at a steady pace for heating purposes, and the PV panels are not yet fully generating electricity.

However, analysis reveals *how* these spikes occurred under current NEM Rules, which allows late-rebidding. In every single instance listed above, the spike happened in the last 5 or 10 minutes of the settlement period and never in the 1st, 2nd, 3rd, or 4th dispatch interval. This was in spite of the fact that the demand increase on these cold days was predictable, and the weather this year was not especially cold, but the generators were able to spike the price to extreme levels, mostly without warning in an oversupplied electricity market.

This was mainly done by Queensland generation at the start of the period moving the price to extreme levels and waiting for changing demand to get re-dispatched at the extreme price at the end of the 30 minute settlement period²³. Getting dispatch for 5 minutes at the end of the period far outweighs Queensland generators not getting fully dispatch at the start of the period.

The combined rebidding during each 30 minutes was astonishing and ranged from 317 MW to 1,168 MW, represent respectively 5% to 18% of available generation at that time. On the majority of these occasions the rebidding volume exceed the corresponding actual demand movement by greater than 100%. It is no wonder that the inter-connectors between NSW and Queensland reversed and bound quickly forcing the dispatch of extremely high priced generation for very short periods of time.

In a competitive environment the rebidding of volume that exceeds the movement in demand would not influence the price to this extent. In these circumstances it does, partly because the rebid volume can actually represents existing generation in Queensland that existed prior to the 30 minute starting. Coal fired generation is more efficient at high utilisation rates, therefore the reduction at the start of a perceived rising demand period is not an efficient way to run a power plant, but it has resulted in higher income for the generators overall portfolio.

² <http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Pricing-Event-Reports/July-2015>

³ <http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Pricing-Event-Reports/August-2015>

Electricity is settled in 30-minute intervals, and there are six 5-minute dispatch intervals within every 30-minute settlement interval. According to the current regulation, generators are allowed re-bid their capacity in 5 minute bids *inside* the corresponding 30 minute settlement interval; investigations have not yet found another country in the world that allows generators to do this. This unique prerogative of the generators provides them with the market power to dramatically change prices for electricity already consumed, and that is exactly what happened in July and August of 2015.

The above cited re-bidding pattern defies the statistical principle of normal distribution. It is impossible to explain why, in every single instance of “late rebidding” leading to a price spike in July and August of 2015, occurred at the last 5 or 10 minute sub-interval, and never in the 1st, 2nd, 3rd or 4th 5-minute dispatch interval.

Both the Australian Energy Regulator (AER) and Australian Energy Market Commission (AEMC) have already officially recognized the tendency of the Queensland generators to take advantage of this market anomaly⁴⁵, while the generators have vehemently insisted that all their re-bids are made in good-faith. This briefing is not contesting generators’ claims that they were acting in good faith or that they were not complying with the current rules. Nevertheless, that does not mean that the market is functioning the way it should be.

The AEMC commissioned Ernst and Young to investigate the impact of this type of late rebidding⁶⁷. This work indicates that, “deliberate late rebidding behaviour has had a significant consequential effect on the prices of financial hedge contracts. It is estimated to have added around seven dollars per megawatt hour (57% increase) to the price of one hedge instrument called “Caps” in the first quarter of 2015”. The impact on 1Q 2016 hedge prices is very significant, if not extreme. In September of 2014 Sun Metals was able to purchase a 1Q 2015 hedge for \$50.50/MWh, but in November of this year the market is trading at around \$93/MWh for 1Q 2016; an increase of 86% in just over a year.

The fundamental issue of rising price when demand is increasing is sound economic theory, but when this is occurring to have very little bids between current production prices to the maximum price, can drive extreme pricing. This bidding pattern is another indication there is not enough competition in the market.

The higher wholesale prices in Queensland in 1Q 2015 and winter spikes seem to reflect market failure through a combination of market power exerted by generators and the mismatch of dispatch costs and settlement prices.

⁴ Australian Energy Regulator – Submission on National Electricity Amendment – Bidding in Good Faith (Options Paper) 12 February 20015 <http://www.aemc.gov.au/Rule-Changes/Bidding-in-Good-Faith> under options paper

⁵ Options Paper National Electricity Amendment (Bidding in good faith) Rule 2014 – Rule Proponent Minister for Mineral Resources and Energy (South Australia)

⁶ Impact of Late rebidding on the contract market – Ernst & Young

⁷ Australian Energy Market Commission – Draft Rule Determination National Electricity Amendment (Bidding in Good Faith) Rule 2015 – Rule Proponent Minister of Minerals and Energy (South Australia) 17 September 2015

Recommendation to improve systemic and transit market power in Queensland

1. Increase competition between Governments owned generators

Competition in the market could be enhanced if the Queensland owned generation assets could be re-arranged, so that they cannot bid into the market as such a large block. New legal entities do not have to set up, but there would be a need for new trading rooms. These trading rooms would have smaller portfolios, with “Chinese Walls” processes separating their activities. Each new trading room business should not control more than 10% of the Queensland electricity market.

For instance, as part of the rebidding process government owned generators can use the combination of reducing low cost coal fired power stations and replacing it with fast responding hydro or dropping hydro-supply quickly⁹. At times, this process can cause price volatility that doesn’t align with underlying supply and demand. The hydro plants could be separated out as their own portfolio, so that there is more competition between coal and hydro plants.

Consideration could also be given to what combination could help reduce electricity constraints in the system, and the high electricity prices, which come from these constraints (e.g. is there a portfolio combination that may reduce the frequency of the inter-connectors binding between Queensland and NSW and causing price separation between the two States).

2. Align Dispatch pricing and settlement pricing to 5 minute durations

The impact of extreme market price outcomes for short periods of time would be addressed to some extent by aligning the dispatch price and the settlements price. This can be achieved through a move to five minute settlements within the NEM, which is technically feasible.

Because of the major negative impact of this market distortion (the disconnect between the wholesale price of electricity at the time of “purchase” (dispatch price) and the final price paid (settlement price) the Government could justify leading an active campaign with the AEMC to take initiatives to revise the rules, so that there is 5 minute settlement for all generators and voluntary election for electricity customers who may settle wholesale electricity prices based on 5-minute intervals instead of 30-minute intervals.

This will (i) eliminate the unfair advantage of generators in being able to change the price of electricity *already consumed*, (ii) allow peak generators to participate in the NEM more rigorously and efficiently, and (iii) promote investment and implementation of smart-grid technologies and other energy conservation technologies.

⁹ <http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Pricing-Event-Reports/January-2015> 16th of January event

Networks (Transmission and Distribution)

2.9 What is the best way to recover the network costs associated with demand from electricity customers more efficiently and equitably?

There is an important simplification in the Rules that is resulting in transmission pricing outcomes that – although consistent with the Rules are having unacceptable outcomes. Since the inception of the Rules generators have not paid for the use of the transmission system that they rely on to ensure their output is delivered to users. The distortions caused by this simplification have been masked to some extent by the smearing of transmission charges between locational components and postage stamp components. However the continued increases in TUOS charges and proposals to make more of the transmission charges locational rather than postage stamped has highlighted the distortions in transmission charges resulting from the simplifications in the Rules.

The discussion below highlights the impact of the Rule simplifications on SMC as a major energy user in North Queensland. This disadvantage is shared but all users in north and far north Queensland.

There is a huge disadvantage being located in North Queensland

It is no secret that SMC, along with others in North Queensland, have long been voicing their concerns about the network charge portion of its delivered electricity cost. This is because North Queensland endures some of the highest transmission costs in the NEM (Fig. 2).

The fundamental source of the discrepancy between costs to north Queensland electricity users and users in central and southern Queensland is that the NEM does not charge generators for the use of the network – the NEM allocates all perscribed transmission costs directly to users.

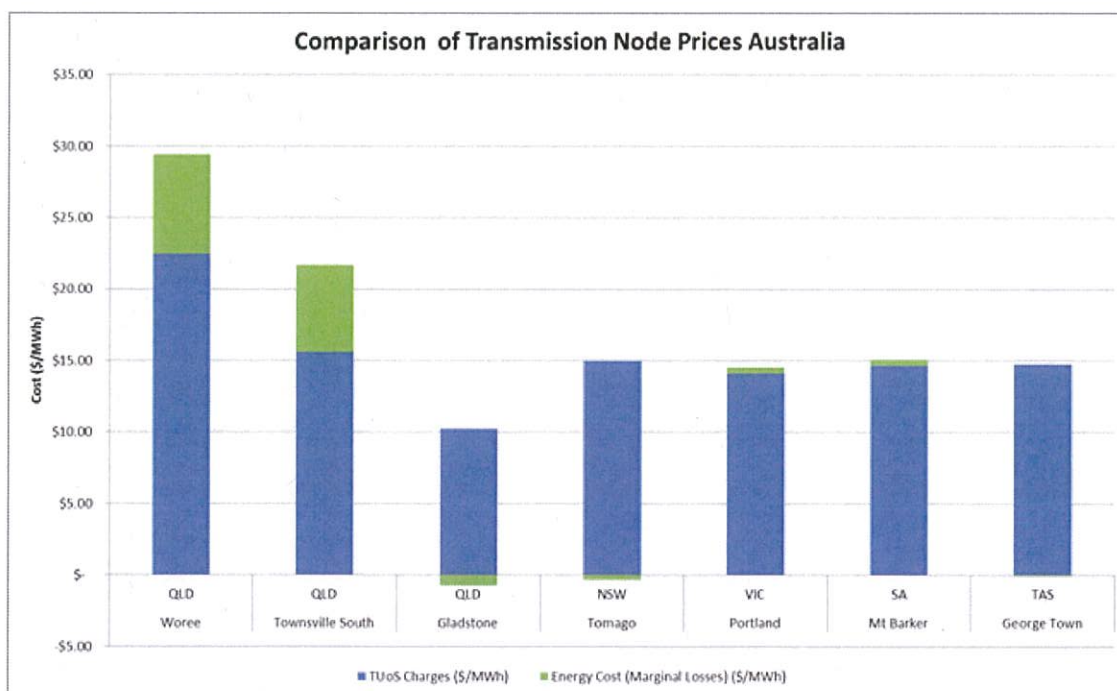


Fig 2 Relative comparison of high transmission in North Queensland

The calculation of Marginal Loss Factors based on a single regional reference node in southeast Queensland compounds the disadvantage to north Queensland.

In 2015, SMC would have saved \$11 million p.a. in network-related charges just by being located in Gladstone instead of Townsville because of the design of the NEM. Queensland government equalizes such discrepancy for some users in the form of Community Service Obligations (CSO) payments, but it does not do so for emission intensive business like SMC.

Current Allocation Restrict Economic Development in North Queensland

The consequence of not equalizing transmission costs across Queensland is that the State limits its growth potential from the rich mineral deposit and processing areas in North Queensland.

Using our company as an example, from the company's inception SMC was designed to expand its capacity by 100% when input and market conditions allowed. One of the restrictive inputs is the high cost of transmission costs in North Queensland. If we did expand the company would inject approximately \$810 million extra p.a. into the Queensland economy.

The payback for the State is when business and investment is growing and thriving, returns will be delivered to the State Government balance sheet.

A fairer and more economically sound approach would be to charge transmission costs equally regardless of location. There is a precedent for this approach, as the wholesale price of electricity in Queensland is the same regardless of location.

One approach is to charge transmission costs to generation as well as users. This would recognise the fundamental role of transmission as a trading facilitator for the generation sector which should be reflected in their costs of generation into the market.

Another suggestion is to charge transmission costs completely to generation rather than end users, this would have an automatic smoothing of costs across the State and would recognise the role of transmission as an economic facilitator.

Transmission costs should be viewed as an enabler to economic growth and be charged consistently in a similar mechanism as CSO are currently being allocated, but not only to certain sections of the economy, but across whole economy.

2.10 How should volume risk be shared between NSP's and electricity consumers?

Under the current pricing model NSP's do not share any of the volume risk of building the network. In most sectors of the economy, a fall in demand for a product usually triggers a fall in price. If the trend continues, assets used to produce the goods or in this case the service become surplus to requirements and are either written-off or written down in value.

In the case of Powerlink, if this is occurring they should not be allowed to have a risk free ride by transferring the economic reality of a changing transmission industry on to its

remaining customers. The normal efficient capital economic principles should prevail and the assets should be written down to reflect the new underutilization of the network.

At some stage the economic reality must be borne on the producer of the service rather than the consumer. Other high fixed costs infrastructure companies (e.g. toll roads) have had to face this harsh reality of underutilisation, and transmission companies should not be treated any differently.

Regional Queensland

4.11 Are there any other options what would increase competition in regional Queensland and maintain a Uniform Tariff Policy (UTP), or deliver the same objective as a UTP.

The application of the current market Rules means that most regional energy users are disadvantaged relative to their south east Queensland “cousins” and competitors. This disadvantage is sustained by the simplification within the Rules and the simplistic application of the Rules. These Rule issues include:

1. Treatment of Queensland as a single Region for the purposes of establishing a Regional Reference Price and marginal loss calculations;
2. Allocation of Transmission charges to users only with no prescribed transmission charges applied to generation;
3. Five year regulatory determinations with no mechanisms to revise parameters in response to rapidly changing development and financing market changes between determinations.

Resolution of the distortions associated with these Rules issues is complicated by the application of the Uniform Tariff Policy in Queensland. The UTP has developed into a mechanism to try and adjust for the market distortions described above.

Queensland currently suffers from the historic legacy of having the majority of its generation in Southern & Central Queensland. To deliver power to Northern Queensland requires expensive transmission infrastructure along with the wasted energy that needs to be produced due to electricity losses that occur over such large distances.

The flow on effect is the Queensland government has to subsidise users in this area via CSO payments to achieve its UTP.

Acknowledging that it is difficult to alter the National Rules to address issues that are most prevalent in north and far north Queensland it is reasonable to explore what strategies could be applied to achieve the appropriate outcomes for electricity costs and development within the current Rules.

As a long term strategy to decrease the amount of CSO payments the government has to pay for transmission losses and to delay future augmentation of the transmission network the government could mandate that:

- the next 2,000 megawatts of generation within Queensland by located north of Mackay (connected to the grid north of Collinsville)
- the majority of Ergon Retail's renewable projects currently out for expression of interests (EOI) to be built in North Queensland
- consider establishing a new NEM Region under the current Rules with Townsville as the Regional Reference Node.

These measures will ensure that the resulting supply side of the industry in Queensland will result in a fundamental change to the economics of electricity supply in north Queensland by altering the role of the transmission system north of Rockhampton as well as creating a competitive generation market in the north Queensland Region.