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Review of the Transmission Regulatory Test

A Proposal by Stanwell Corporation Limited for the Incorporation of Competition Benefits

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The Importance of transmission investment

Stanwell Corporation Limited (Stanwell) believes that transmission is the single most important issue facing the NEM. This view is supported by the COAG review into the energy market, which stated in its executive summary

> *"The current state of transmission is one of the most significant problems facing the NEM";* and
>
> *"….many current problems that were caused by inadequate transmission"[1].*

It is widely acknowledged that there is insufficient investment in transmission to allow competition between regions and within regions.

Evidence of this has been highlighted by a couple of recent significant issues in the NEM. Treatment of constraints has reached a level of importance that NEMMCO and NECA have embarked on a joint project in an effort to resolve the issues, which mainly result from a lack of transmission. Furthermore, the recent regional boundaries report by NEMMCO identified a number of potential regions around the NEM. Their identification is primarily due to a lack of intra-regional transmission. As a result, any changes to the regulatory test need to be considered in the context of an urgent need for substantial transmission investment.

The lack of a competitive transmission platform in the NEM is arguably more of a regulatory issue than an economic one. Precision about the economic justification for network augmentation is unwarranted at this stage in the development of the NEM. Stanwell believes that there are a number of clearly identifiable augmentations to the transmission network to alleviate constraints that should occur without the need for debate over their economic necessity. Rather, economics should determine the lowest cost augmentation of the most obvious constraints. The Commonwealth and the various NEM jurisdictions need to support a solid, competitive transmission platform for the NEM now by encouraging network investment.

For example, Stanwell believes there would be limited, if no objection, to an augmentation that would alleviate the Tarong constraint, as there would be little argument over the benefits it would bring to the market. The primary issue would be ensuring the lowest cost option for the augmentation.

Application of a simple, structured and widely supported framework for assessing market benefits for determining whether or not an augmentation is necessary (not economically justified – that is taken as a given) is what is needed for the immediate future. Once a competitive platform is established under this regime, a more sophisticated, economically sound method can be applied when the market benefits are marginal. In the meantime, such methods can be developed while the transmission grid is brought up to a competitive standard.

To ignore the current situation, leaving the regulatory test unchanged, is a regulatory decision to leave the National Electricity Market with the legacy of a parochial transmission system strung together by inadequate interconnects. Stanwell believes that the ACCC is at a cross roads in the journey of the NEM, with the least attractive option being to do nothing. Stanwell strongly encourages the ACCC to stimulate investment in transmission, and release the stranglehold on TNSP’s ability to invest.

Dispelling the myths

The first myth that has perpetuated in relation to the NEM, particularly by those with the intellectual power to know better, is the fictional notion of short-run marginal cost bidding. SRMC bidding has not occurred, is not occurring and will not occur in the NEM. The only time regions in the NEM that have come close to SRMC bidding is in situations of massive and unsustainable oversupply in the market (Victoria at market start and recently Qld). Regional spot prices around the NEM have converged to a predictable average of $35-40/MWh – a figure widely accepted as the economically sustainable LRMC in the generation sector. This average price has not been determined by the SRMC of the marginal generating plant in the NEM but by the strategic bidding of those generators, including the occasional price spike at or near

[1] pp 22,23 “Towards a Truly National and Efficient Energy Market”, COAG Energy Market Review Final Report, 2002.

VoLL caused by a tight short-term demand and limited supply (sometimes caused by transmission constraints).

The use of SRMC in assessing competitive benefits of transmission is out of step with the realities of the NEM.

The second myth is that increasing the number of regions or implementing nodal pricing and FTRs will solve the immediate problem of lack of transmission. Nodal pricing is supported aggressively by some participants in the NEM as the solution to the transmission problem. This view is flawed because neither nodal pricing nor FTRs have been proven to be effective signals for network investment. Purely from an economic sense, both will certainly highlight the lack of transmission, but in relation to actually delivering the necessary new transmission, neither option provides the solution.

More regions and/or nodal pricing are concepts that can be explored once a competitive and robust transmission network has been developed and therefore should be put to one side so that regulators can concentrate on the real problem in the short to medium term – which is the lack of transmission.

Cost of transmission

In terms of the energy market, transmission costs are relatively small. In fact, for the 2001/02 financial year, the combined regulated revenue caps of all TNSP's operating in the NEM represented only 20% of the value of the energy market. Following on, this value would only rise by approximately 4%, if the NEM's total transmission revenue cap figure were to increase by 20%. In terms of energy prices, given an annual pool price of $35/MWh, a fall of just $1.40 would compensate consumers for any increase in transmission charges. The cost of a relatively large transmission investment, when compared to the turnover in the energy market, fades into insignificance. Stanwell believes that the transmission investment represented by a 20% increase in revenue caps across the NEM would significantly improve generators access to the market and the resultant competition would have a dampening effect on pool prices.

Further, table 1 outlines the approximate cost of a number of augmentations that have been commissioned in Queensland over the past 5 years. These costs can be compared to the cost of installing generating plant downside of a constraint, namely open cycle gas turbines (OCGTs), which Stanwell estimates to be approximately $0.6m/MW. In addition to its lower capital cost, transmission has minimal operating costs relative to generating plant.

Table 1 costs of various transmission augmentation in Queensland

	Capacity (MW)	Length (km)	Capital Cost ($M/MW)
QNI	700	550	0.50
Calvale-Tarong	700	330	0.17
Tarong-Blackwall	250	130	0.34

Source: Powerlink

From another angle, table 2 provides a financial year-to-date regional pool price progress report, which indicates the significant deviation in pool prices across NEM resulting from the lack of interconnection. Additional examples of pool price separation across the NEM are provided in Appendix 1.

Table 2 year-to-date regional pool prices

From 01-Jul-2002
To 30-Apr-2003 Today

Time Weighted	QLD1	NSW1	SA1	SNOWY1	VIC1
Flat	**$ 39.91**	$ 32.67	$ 30.38	$ 29.73	$ 26.84
Peak	**$ 54.11**	$ 42.63	$ 38.67	$ 38.10	$ 35.34
Off-Peak	**$ 26.94**	$ 24.61	$ 23.67	$ 22.94	$ 19.96

Demand-Weighted	QLD1	NSW1	SA1	SNOWY1	VIC1
Flat	**$ 42.58**	$ 34.79	$ 31.91	$ 25.53	$ 28.03
Peak	**$ 55.10**	$ 43.94	$ 39.38	$ 36.94	$ 35.92
Off-Peak	**$ 28.59**	$ 25.68	$ 24.65	$ 20.43	$ 20.42

Identification of required augmentation

Market network services have been an abject failure and to persist with allowing them to scuttle the process of the regulatory test is irresponsible. The market needs regulated transmission investment in the short term, and an appropriate framework for market services can be developed in the meantime and implemented at a later date if appropriate.

Economic approach to transmission investment

In the ACCC's Discussion Paper, several methods of assessing the economic benefit of a transmission augmentation were discussed. The concept of being able to determine a positive net-present-value for a network augmentation based on market benefits is an attractive one, but very difficult to achieve. The disadvantages of the various proposed methods are outlined in the paper.

Stanwell supports an economically based approach that is as practical and workable as possible, and as such, believes that Market Simulation appears to be the most promising. The proviso is, of course, that some fundamental principles are satisfied, such as:

- All TNSPs or planners use at least two alternative modelling methodologies;
- A set of data for each model is agreed and accepted by industry stakeholders; and
- Long-run marginal cost bidding is used in all cases as an underlying principle with economic opportunity bidding used when constraints bind.

Given that it may take considerable time to evaluate and select models, develop the relevant databases and agree on the finer details of the principles to be used, Stanwell believes that this is not a short-term solution.

The lack of transmission capacity in the NEM requires a competitive benefits methodology that can be developed quickly which simply and reliably accounts for competition benefits without resulting in excessive investment. In the meantime more sophisticated economic methodologies can be developed in consultation with industry that can apply once transmission investment becomes more marginal.

For this reason, in the short-run a benchmark approach to the application of the competition benefits test is recommended.

Retention of the current test

Although the current market benefits test has failed to deliver an augmentation, there is no reason to discard it from the test. It may simply need enhancement or another limb to help it function appropriately. The current test was never intended to stall the process of competition based augmentation, in fact it was there as a facilitation mechanism. The fact that it has not facilitated investment clearly indicates that an improved approach is required.

Stanwell believes (as stated above) that SRMC based methodology is not reflective of realities in the market, and is therefore likely to fail. The test could be enhanced by use of LRMC in place of SRMC, particularly when the typical capacity factor of the different types of plant is taken into account. Rather than expect the TNSP to make an assessment of the LRMCs of the relevant plants involved with the evaluation, Stanwell proposes that a table of standardised LRMCs be developed for the purpose. This would remove some of the inevitable difficulties faced by TNSPs arriving at appropriate costs and would avoid dispute over the outcomes. The LRMC should take into account the likely capacity factor of the plant resulting from its indicative fuel cost. Although Stanwell does not advocate the application of a “merit order” based approach in a market situation, generally fuel cost is a reasonable indicator of likely capacity factor. The lower the capacity factor, the higher the LRMC needs to be for the plant to recover its fixed costs. For this reason, an evaluation based on LRMC is more likely to bring about a positive NPV under a market benefits test.

Benchmark approach to transmission investment

Stanwell believes that a benchmark approach to transmission investment is required in the short-term so that a competitive platform can be established within the NEM. Such an approach, which will encourage the construction of transmission to alleviate frequent constraints, need only be applied for a limited period of time until the network reaches the level necessary to provide generators with competitive access to the market.

It is proposed that a principle similar to that used for reliability augmentations be applied to competition benefits. Under the regulatory test, once a threshold of unreliability is reached, the TNSP is required to develop the lowest cost alternative to reinstate the reliability standards. In a similar way Stanwell is proposing a simple but robust competitive benefits hurdle, which if met, will allow the TNSP to proceed with the development of the least cost alternative to alleviate the relevant constraint.

In its previous submission, Stanwell proposed that an index be developed that would incorporate the following information:

- The number of electricity consumers currently affected by the constraint;
- The incremental electricity capacity supplied to the market following augmentation;
- Fuel mix of the incremental electrical capacity (indicating underlying cost structure); and
- The number of independent entities supplying the market following augmentation.

Further to this list, we suggest the incorporation of the following equally important information.

- The number of hours a constraint has bound over a specified period of time;
- The price effect of binding constraints; and

- The reserve margin downstream of a constraint.

The purpose of the index is to rank constraints to establish a priority order for their augmentation. One possible concept is to allocate points for each component of the index such that when a threshold level of points is reached, the constraint qualifies for augmentation. The aim would be to engage the uncertainty and the debate in establishing the scale of points and the measures against those points. That way, once the table is established with measures that are as clear-cut as possible, there would be minimal scope for disputes resulting from the application of the table to a constraint. Further, given that this suggested approach does not solely rely on price outcomes, it is applicable to intra-regional as well as inter-regional proposals.

The risk with this approach is that if the threshold is set too high or too low, it may result in over or under investment in transmission. For this reason it is proposed that safeguards to protect against over or under investment and these are discussed later.

Hours/year bound

The number of hours bound over a period of time is an obvious indicator of the need for augmentation. Clearly a constraint, which would normally qualify for the implementation of a new region boundary (which has not for other reasons), should effectively go to the top of a TNSP's priority list.

Depending on the number of constraints identified with the above measure, a high ranking may be applied to constraints with a lower duration of binding than that required for a region boundary. The level would need to be established in the process of refining the test. In the same vein, constraints with an even lower frequency and duration of binding may qualify with the support of numerous other factors set out in this proposal.

Price effect of binding constraints

Once a group of binding constraints have been ranked by the duration they are constrained, an assessment of the impact that the constraint has had on price would be established. For example the price before and after the constraint binds could be extracted and evaluated from available market data. The change in price before and after the constraint becomes unbound should also be evaluated. From this analysis a ranking (or number of points) can be established corresponding to an observed change in spot price.

Some constraints are likely to have a greater impact on price in the relevant region by the nature of the participants that are affected by the constraint. Those constraints that demonstrate a price effect should be ranked more highly. Also constraints that do not affect supply to the node will not influence the pool price due to the market design.

Obviously a change in price could be caused by factors other than the constraint, so either more in depth investigations would be required if a large change in price was noted or alternatively, the ranking score applied to this measure could be appropriately discounted to allow for the impact of other factors which may have contributed to the price increase.

The number & size of consumers impacted by the constraint

This indicator is based on the number of consumers affected by a constraint, as opposed to how they are affected. Although it would be ideal to assess how much they are affected (by change in spot price), as previously discussed, this is difficult. Stanwell believes that under the proposed rating system, all else being equal, a constraint that affects more customers should take priority.

Consumers are affected by constraints in a number of ways, but in relation to competitive benefits, the factor relevant to consumers is the impact on energy price and network price if the constraint is removed. Alleviation of an inter-regional and some types of intra-regional constraints would be expected to reduce the energy price for all customers in the relevant region.

For example, when the Tarong constraint binds, generation is taken from plant in the southeast corner of Queensland, generally at a higher price. Because the node is also in the southeast corner, the result is a higher price for the whole region, meaning that all customers in the Queensland region effectively pay for the constraint.

Constraints that do not affect supply to the node do not have an impact on spot price due to the way intra-regional constraints are managed in the NEM. If support is required for such a constraint, either NEMMCO must direct generators to provide support and compensate the generator, or the TNSP must enter into a network support agreement to meet its network obligations. Costs associated with either directions by NEMMCO or network support arrangements between the TNSP and relevant generators are socialised over all customers in the region rather than paid by those that benefit from the alleviation of the constraint. This means that the benefit to the affected customers of alleviating the constraint cannot be readily valued using those costs.

Trying to differentiate between two comparable constraints should not be hindered by the inefficient method of signalling the cost of an intra-regional constraint in the current market design. Also, in principle, alleviating a constraint that affects the price at the node should be of no greater value to the market than a constraint that does not.

An appropriate measure can however be based on the size of consumers on the downstream side of the constraint. An underlying assumption here is that those consumers will carry the bulk of the cost of any augmentation. Certainly, if transmission costs were not as socialised as they currently are, those consumers should carry the cost of the augmentation. There is also a degree of common sense that an augmentation that services a greater size of consumers should rate more highly than one that does not.

Stanwell does note that this aspect of the index may raise some equity concerns. However, we believe that such issues can be addressed as the index is further refined.

Incremental amount of generating capacity supplied to the market

Alleviation of a constraint will result in capacity upstream from the constraint gaining improved access to the market. This can be measured from historical data. The greater the amount of capacity that is constrained, the greater the benefit gained from alleviating the constraint.

Although interpretation of dispatch results is never straight forward, it would be possible to estimate the amount of generating capacity constrained on or off when a constraint bound. In the case of an intra-regional constraint that is managed by a network support agreement, it would be relatively straightforward to assess the amount of capacity dispatched to relieve the constraint.

NEMMCO has indicated that it would be possible to determine the amount of constrained off or on plant, but would require significant investment in resources to extract the results by rerunning dispatch with the constraints relaxed. A simpler but cruder method of determining the amount of constrained generation could be found such as assessing the increase in demand on the downstream side of a constraint once it binds.

Plant and fuel type of the incremental capacity supplied to the market

Once the amount of capacity excluded from the market by the constraint is determined it would be possible to also assess which plant was constrained off and on and therefore its plant type, and what fuel it uses. The type of plant and fuel type will give a guide to the likely LRMC of the plant and therefore its likely bidding behaviour.

This information does not need to be precise for the sake of the test. A table of relative LRMCs could be developed based on generic plant and fuel types for use by all TNSPs. From the table, and the dispatch information obtained from the relevant constraint it would be possible to determine a rating which would form part of the ranking of the competitive benefits of relieving the constraint.

Number of independent entities associated with the increment of capacity

Clearly if more than one participant gained access to the market by the relief of a constraint, it would be reasonable to expect a greater competitive benefit. The ranking of a constraint should be higher if there are multiple participants who gain access to the market as a result of its relief.

Reserve margin downstream of constraint

Stanwell concurs with the proposal by CS Energy that the local reserve margin be used as an indicator of the need for transmission augmentation. The implication of a low reserve margin downstream of a constraint is that there is a greater probability that generators will have short-term market power from time to time and if the generators have access to the node, they can influence the price paid by all customers in the relevant region. Generators on the downstream side of a constraint, which cannot affect the price at the node, may be able to exercise market power in relation to network support arrangements. A scale with a ranking score that increases as the reserve margin tightens could be applied to constraints.

Establishing the test benchmark

Stanwell believes it would be relatively straightforward to establish a ranking system based on the above principles. In addition, the ranking of a constraint may need to be modulated by the likely cost (in $/MW) of the augmentation to ensure that those that bring the greatest benefit for least cost are ranked highest. Subsequently a benchmark ranking can be set such that constraints that meet or exceed the benchmark, qualify for augmentation on the grounds of competitive benefits.

Stanwell believes that as an economic regulator, the ACCC would need to take an active role in setting the benchmark to ensure that reasonable and not excessive development of the transmission network occurs. The ability to adjust the benchmark would provide one safeguard against excessive investment.

The advantage of a clear-cut benchmark is that the debate over an appropriate ranking system may occur during its establishment, such that there is minimal scope for dispute over an augmentation that meets the benchmark.

As a guide to Stanwell's proposal, Appendix 2 provides an example of a ranking table.

Setting investment boundaries

The risk of the proposed benchmark approach to transmission investment is that if the benchmark is set incorrectly, there may be over investment in transmission. In Stanwell's view, there is limited risk in erring on the side of over investment in transmission because it believes that the total price risk to consumers is less than under investment.

Despite this, Stanwell believes it would be appropriate to establish boundaries or limits on the amount of investment as a means of ensuring that excessive over investment does not occur. The limits could be based on one or more of the following criteria:

- Maximum number of augmentations in a given period;
- $ limit on the amount that can be spent on augmentations in a period;
- Expenditure limit that is a proportion of the existing asset base (say 10 or 20%); and
- Limit on the increase in regulated revenue.

These limits could be relaxed in time after stakeholders gain confidence in the ranking process. This may require the ACCC “ticking off” proposed augmentations on a fast turnaround basis.

TNSP certainty and stranded assets

In Stanwell’s opinion TNSPs have been justifiably cautious in their assessment of augmentations because of the risk of stranded assets that are optimised out in the process of regulatory review. Stanwell believes that under the regime proposed in this submission that assets constructed during the period that the benchmark approach is active be excluded from regulatory review for an extended period (10 years for example). In this way a TNSP can proceed with augmentations that meet the benchmark with confidence that these assets will continue to earn revenue for an extended period of time.

Conclusion

In summary Stanwell would like to make the following points:

- Lack of transmission is one of the most significant issues in the NEM;
- To allow the Regulatory Test to remain unchanged would be a regulatory decision in itself that a lack of competitive access to customers by generators is acceptable;
- A viable “economic” approach to the competition benefits test is an important goal but will take too long to establish;
- In the short-term the benchmark approach to identifying the most beneficial transmission augmentations is recommended;
- Constraints can be ranked empirically on the basis of a clear-cut test, such that those that pass the set benchmark qualify for augmentation;
- Augmentation would proceed on a lowest cost option basis (similar to the reliability test); and
- Boundaries or limits set in such a manner to avoid the risk of over investment.

APPENDIX 1

Price separation in the NEM

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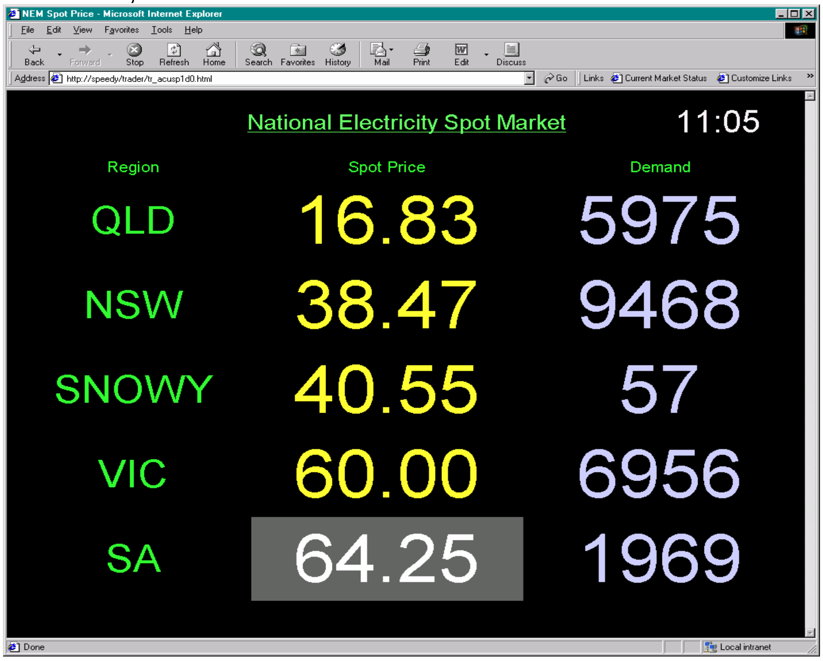

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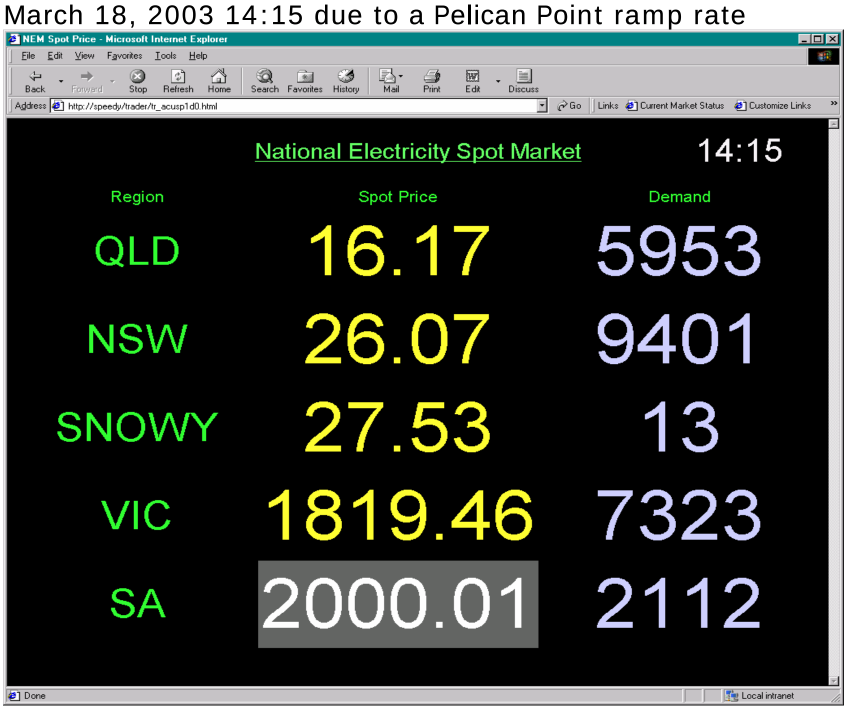

APPENDIX 2

Competition Benefit Ranking Table

100 Points Rule

Part A) Hours Constrained in a 12 month period	
> 50 hours	90 points?
> 20 hours	? points
> 5 hours	? points
Part B) Price Effect of Constraint	
> $100/MWh average	90 points
> $50/MWh average	? points
> $20/MWh average	? points
Part C) Customers Downstream	
? MWh/yr	? points
? MWh/yr	? points
? MWh/yr	? points
Part D) Incremental Capacity Brought to the Market	
> 200 MW	90 points?
> 100 MW	See below
> 50 MW	See below
Part E) Type of Incremental Capacity	
Steam, Black Coal	Points = factor * MW increment
Steam, Brown Coal	Points = factor * MW increment
GT, Gas	Points = factor * MW increment
GT, Distillate	Points = factor * MW increment
Hydro	Points = factor * MW increment
CCGT, Gas	Points = factor * MW increment
Part F) No. of Independent Entities	
1	0 points
2	? points
>2	? points
Part G) Reserve Margin Downstream	
<10%	? points
< 15%	? points
< 20%	? points

Ranking Score Calculation

Score = Part A + max(Part B, Part G) + Part C + max(Part D, Part E) + Part F

If the score = 100 points or greater, is it the least cost option within investment limits?
Yes / No