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Monday, 30 January 2012

Dear Tim and Rainer,

**Re: South Australia-Victoria (Heywood) interconnection upgrade**

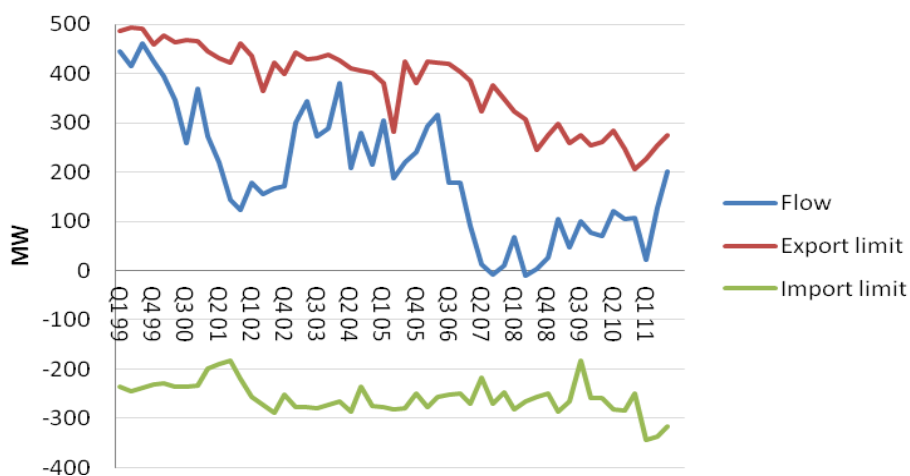
The private generators listed on the side-bar welcome the opportunity to make a submission following AEMO and ElectraNet's release of the project specification consultation report (PSCR).

**1. Background**

Interconnector limits have a profound impact on market operation. With a significant generation portfolio in South Australia and Victoria, the private companies listed are sensitive to changes in the transmission limits on the Heywood interconnector between Victoria and South Australia.

An example of this has been the noticeable decrease in the Heywood interconnector capacity particularly for flows from Victoria to South Australia (i.e. the export limit). Figure 1 shows the average quarterly limits on the interconnector from 1999 to the present. The export limit is shown by the red line and the downward trend is obvious.

**Figure 1 – Heywood average quarterly interconnector limits (1999-2011)**



This reduction in export capability has reduced both the reserve margin available to South Australia from other National Electricity Market (NEM) regions and South

**Private Generators:**  
AGL Energy  
Alinta Energy  
Energy Brix  
International Power  
GDF-Suez  
Origin Energy  
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Australia's ability to access lower cost interstate power. From a commercial perspective, this undermines confidence in inter-regional trading as parties are not able to effectively manage basis risk. In turn, this reduces contract liquidity and overall competition in the market. Ultimately, this limits the benefits of the NEM for South Australian consumers.

As a private generation businesses operating in the NEM, we would like to have sufficient assurance to buy and sell wholesale electricity derivative contracts within all regions. Degradation of interconnector limits below previously economically justified levels effectively reduces confidence to do so. We also suggest it is to the detriment of overall market efficiency and power system reliability for interconnector capacity to be allowed to erode in such a manner.

We anticipate that discussion on this subject will also arise from the Transmission Frameworks Review being undertaken by the Australian Energy Market Commission (AEMC). We also note the announcement by the Productivity Commission to consider if efficient levels of transmission interconnectors are being delivered to support the efficient operation of the NEM.

We believe all of these factors support work to assess the management of the existing Heywood interconnector capacity and evaluate possible enhancement of capacity and thus we are supportive of the process that AEMO and ElectraNet are jointly pursuing.

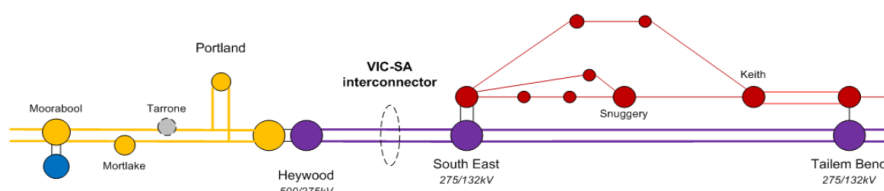
We support economic based assessment of technical options to support increases in interconnector transfer capability provided this is carried out in accordance with the RIT-T principles. Specifically, AEMO and ElectraNet should, within reason, consider as many technically feasible options as possible in its cost benefit analysis.

Any proposed transmission augmentations to enhance the Heywood augmentation should also consider the total interconnection between Victoria and South Australia (i.e. including Murraylink).

## 2. The AEMO/ElectraNet PSCR findings

The PSCR was clear in its findings on the current network limitations affecting the Heywood interconnector (see Figure 2).

**Figure 2 – Existing network limitations (source ElectraNet/AEMO Forum slides 24 November 2011)**



Existing Interconnector limits are due to:

- ↔ Heywood 500/275 kV transformer ratings (460 MW)
- ↔ Thermal ratings in SA 132 kV network
- Voltage stability limits in the South East area (trip of largest unit in SA)
- ← Oscillatory stability limit (limit for Murraylink and Heywood, 580 MW)
- ← 500/330 kV F2 transformer rating at South Morang (for high VIC - NSW flow)
- Victorian Export transient stability limits

We were pleased that the following points were highlighted in Section 2.2 of the PSCR:

- The power transfer capability from Victoria to South Australia is frequently restricted by voltage stability limits in south-east South Australia, particularly during high demand conditions and when there is high generation in south-east South Australia.
- The power transfer capability from South Australia to Victoria is frequently restricted by the thermal capability of the South East 275/132 kV transformers in South Australia (bound for 204 hours in 2010).
- The 275 kV transmission lines between the Heywood and South East substations are rated up to about 45% higher than the presently limiting transformer section of the interconnector flow path. The current capacity limitation affects the extent to which electricity can flow across the interconnector. Specifically, it affects the amount of generation from other regions in the NEM which can be used to meet peak demand conditions in South Australia. It also restricts the amount of wind generation which can be exported from South Australia at times of high wind output but low South Australian demand.

As generators we have been affected by the thermal and voltage stability limits in south-east South Australia and the transformer capacity limits at Heywood in Victoria.

We also note that the most recent Annual Planning Report from ElectraNet<sup>1</sup> indicated that a number of potential solutions have been identified to alleviate constraints related to the Heywood interconnector capability. Some of these options were low cost and included:

- Reducing unnecessarily high AEMO operating margins applied to the outputs of constraint equations;
- Increasing the rating of limiting 132 kV lines in the south east region of South Australia;
- Applying certain long-term voltage stability constraint equations on the basis of capacitor availability rather than capacitor status;
- Un-meshing of the 132 kV system in the south east region; and
- Series compensation of the 275 kV lines between Tailem Bend and South East as well as additional dynamic reactive power compensation (SVCs).

We would like to see these intra-regional South Australian issues addressed as a matter of priority. Simply improving capability of the interconnection between Heywood and South East of South Australia without addressing the within-region South Australian limits will not address the current issues which we have already described.

As such, we suggest AEMO and ElectraNet evaluate intra-regional issues affecting South Australia separate to the case for various interconnector options. Interconnector options may or may not be economically justifiable in their own right following the RIT-T process and should be assessed accordingly. However, the matters above require discrete consideration and are likely to justify action in advance of the date when, for instance, a Heywood option becomes feasible.

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<sup>1</sup> See <http://www.electranet.com.au/assets/Uploads/2011-Annual-Planning-Report.pdf>

On this basis, we see little reason to delay intra-regional augmentations pursuant to an extended RIT-T process. However, we note that should an interconnector option be justifiable within the short-term this would facilitate resolution of interconnector and intra-regional issues.

### **3. PSCR credible options**

The generators listed make the following comments on the four credible options presented in Section 3 of the PSCR:

#### ***Installation of a third 500/275kV transformer at Heywood along with reactive support in South Australia***

If a combined package can be justified, we suggest that this option is the most reasonable and effective to address the problems we have already discussed.

We are against a proposal that would improve capability between Heywood in Victoria and South East in South Australia and leave the “upstream” issues in and around the south east unresolved. We would prefer that the option to add a third 275/132kV transformer at South East be included as part of this option and not simply left to a sensitivity study.

#### ***Construction of a new Krongart-Heywood 500kV interconnector***

At this stage, we do not believe that this option is a proportionate response to the current and future problems. It is unlikely that the option would pass the RIT-T, with its estimated cost of circa \$500 million. In addition, if it were to pass the RIT-T, we expect this option would take significantly longer to implement, which could delay a solution to the current issues.

#### ***Non-network options***

We consider that the two non-network options presented have very limited detail in relation to both cost and technology. As such, it is difficult to assess whether the two options (demand management and utility scale storage) could have a material effect.

We are aware that Infigen will be proposing an option to improve capability from South Australia into Victoria via a special control scheme. The proposed scheme is similar in principle to the Basslink Network Control Special Protection Scheme currently in operation.

We suggest that the proposal being developed by Infigen is far more credible as a non-network option, and encourage AEMO and ElectraNet to consider it in detail as part of the RIT-T process.

### **4. Summary**

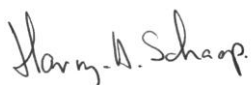
To conclude, the private generators listed in this submission make the following comments:

- We are supportive of AEMO and ElectraNet’s efforts to assess interconnection capacity between Victoria and South Australia;
- In addition to evaluating interconnector capacity between Heywood and South East, the network limitations that affect generators in and around South East in South Australia must

also be overcome to ensure the increased interconnector capacity is not limited by intra-regional constraints;

- We would like to see the network limitations in and around South East in South Australia resolved and would not support an outcome from this RIT-T process that did not address this problem;
- We see no reason why network limitations issues in the South East should be dependent on the viability of a potential interconnector upgrade but understand the value of joint progress where a interconnector upgrade is justifiable in its own right in the near term; and
- We encourage AEMO and ElectraNet to consider all credible options including any low-cost non-network options such as special control schemes.

Yours sincerely,

A handwritten signature in black ink that reads "Harry A. Schaap". The signature is written in a cursive style with a large initial 'H'.

Dr Harry Schaap  
(on behalf of the listed generators)