

Hugo Klingenberg
Senior Manager, Network Development
ElectraNet

Monday, 27 February 2017

Dear Mr Klingenberg,

Thank you for this opportunity to comment on ElectraNet's Project Specification Consultation Report (PSCR) and RIT-T market modelling approach, assumptions report (MMAA Report) and the Supplementary Information Paper (Supplementary paper).

ELL owns interconnectors currently connecting:

- Queensland and New South Wales (Directlink)
- South Australia and Victoria (Murraylink)

ELL has identified a range of modifications that could be made to Murraylink that will provide benefit to South Australian customers. Minor modifications to the control system on Murraylink can provide frequency controls services. Also, in its recent revenue reset proposal submitted to the AER, Murraylink outlined a staged proposal to increase the capacity of the Murraylink interconnector, which would provide capacity and reliability benefits to the South Australian system.

We recognise the difficulty of the task that ElectraNet is facing in undertaking this RIT-T due to changing circumstances in the electricity market in South Australia. In light of this we have the following observations that may aid ElectraNet going forward. In particular ELL note:

- Recent events in the South Australian market have highlighted the importance of system security. ElectraNet's RIT-T can benefit from assigning an economic value to the provision of these services that is consistent with the economic value assigned to additional capacity;
- ElectraNet are undertaking this process in constrained timeframes which creates difficulties, as highlighted by the need for a Supplementary paper. In these circumstances consideration should be made with respect to inconsistency between the evaluation of network and non-network options;

- While recognising the 2016 Australian Energy Market Operator's (AEMO) Electricity Statement of Opportunities is the most recent version of this document, ElectraNet need to be careful before relying on the document as subsequent events have made it out of date, particularly in relation to ancillary services; and
- The dynamic nature of the generation market in South Australia means that there is value in flexibility (optionality) with respect to the delivery of projects. It would be helpful if ElectraNet could outline the approach to calculating the economic value they are assigning this capability.

Ell is of the view that with the above modifications ElectraNet will be undertaking a RIT-T process that is much more likely to identify the correct resolution to the identified need in South Australia.

Project Specification Consultation Report

Ell has the following observations in relation to the approach outlined in the PSCR.

Identified Need

Ell agree the main drivers for a project in the South Australian National Electricity Market region are:

- Facilitating greater competition between generators in different regions, leading to lower dispatch costs and consequently lower wholesale prices, particularly in South Australia.
- Providing appropriate security of electricity supply, including management of inertia, frequency of response and system strength.
- Facilitating the transition to lower carbon emissions and the adoption of new technologies.

While Ell agrees that price divergence in the wholesale market between South Australia and other regions of the National Electricity Market (NEM), if demonstrated to be an ongoing long term phenomenon, is a cause for concern, we caution against making this the sole or primary focus of the benefits assessment as it will undervalue the need to provide technical solutions that provide stability to the network in terms of frequency and voltage and the importance of connecting lower CO₂ emitting generation going forward.

The events of 28 September 2016 demonstrated that the current market framework has undervalued the importance of network stability in terms of voltage and frequency control.

AEMO identified that there were significant voltage and frequency changes in the moments immediately prior to the system blackout that made a significant contribution to the state wide blackout.¹

As ElectraNet are aware, the issues associated with voltage and frequency control is increasing due to the changes that are occurring across the NEM and in particular in South Australia. Given the focus on reducing the impact of CO₂ both the problem this produces for network stability and the value associated with resolving it are likely to get greater going forward.

Credible options

Recognising that this is the first report in the RIT-T process, we would encourage ElectraNet undertaking the following:

1. Broad, active consultation going forward; and
2. Application of consistent assessment criteria for all projects where relevant.

Broad, active consultation

The AER's guideline for RIT-T states that the PSCR should set out amongst other things

"a description of all credible options that the TNSP considers address the identified need"

The drivers for this RIT-T are not the same as those encountered in previous RIT-Ts. This introduces a degree of complexity that has not had to be addressed in previous RIT-Ts. The need for analysis in relation to inertia (frequency and voltage control), as a result of the changing nature of generation, is an additional complication.

EI is of the view that there is benefit in ElectraNet engaging with stakeholders in an active way prior to proceeding to the project assessment stage as it will enable it to produce a more balanced and sophisticated assessment at that stage.

EI does note the obscurity of the AER's RIT-T guidance that requires ElectraNet to identify credible options at the same time as inviting others to put forward their credible options. It gives the impression of bias and it is something the AER may wish to revisit in any future amendments to the guideline.

¹ AEMO, BLACK SYSTEM SOUTH AUSTRALIA 28 SEPTEMBER 2016: Third Preliminary Report, December 2016, section 3.1

The assessment criteria

It is important that ElectraNet apply consistent assessment criteria, where relevant, against all credible options going forward.

In relation to non-network options ElectraNet state

"To meet the identified need, non-network options would need to provide a minimum amount of inertia, active power (MW) and energy (MWh) and provide a response within the first 0.5 seconds of a system disturbance event, and as close to time-zero as possible."

Broadly EII agree with the need to have an understanding of these significant factors. Although given the nature of the problems being addressed in South Australia the role for frequency and voltage control are more significant than implied in this statement.

The other difficulty that ElectraNet face is that technological developments mean that the identified need may be resolved by the adoption of a range of different solutions rather than have one approach that addresses all of the identified need.

There is also benefit in ElectraNet specifically noting that the same criteria, derived from the identified need, will be applied to non-network and network solutions alike.

MMAA Report

EII acknowledges the problem that ElectraNet have in trying to develop a framework for consideration of the credible options in relation to their RIT-T.

As noted previously, the challenge for ElectraNet, in regards to the measurement of benefits for different credible options, is that the nature of the problem in South Australia is not the same as issues that have arisen in the past.

In the past the drivers of the RIT-T have largely been related to providing specific capacity to address demand or supply growth in particular areas or the ability to further competition in the wholesale market by augmenting competition from other generators.

South Australia is at the forefront of issues of changes in the nature of generation. In this respect ElectraNet's RIT-T represents the first RIT-T that seriously needs to address issues of network stability in light of the growth of renewable generation.

High level assessment

EIi recognise that one of the difficulties for ElectraNet is how to reduce the number of options down to a manageable number for further investigation. ElectraNet has chosen thermal capacity as the first high level assessment. EIi's understanding is this was modified in the Supplementary Paper by including an assessment of the contribution to 3Hz/s or 1Hz/s RoCoF standards. EIi supports moves to link the "first pass" assessment to all aspects of the identified need.

EIi notes for the purposes of the "first pass assessment" an assessment on the minimum required standard is appropriate as the purpose of the initial assessment is not to determine the preferred option but rather eliminate those projects that are highly unlikely to become the preferred option.

Ancillary Services

In relation to the valuation of ancillary services ElectraNet relies on the AEMO 2016 Electricity Statement of Opportunities. This document states that there are sufficient ancillary services provided in South Australia.

Unfortunately, subsequent events in South Australia have shown that the AEMO may need to refine their approach to ancillary services and that ElectraNet will need to consider ancillary services as part of their assessment of credible options. This is highlighted by AEMO currently conducting a consultation on an amendment of the market ancillary service specification.

Information

In order for all participants to be on an equal footing in this process it is important that ElectraNet share its power flow modelling assumptions to all relevant parties as well as make available information about the adequacy of the existing network.

Real option valuation

Reflecting the unusual nature of the identified needs in South Australia ElectraNet are likely to receive proposals that are capable of staging or involve multiple smaller assets. The ability to stop a development after a particular stage or halt or change a roll out while still delivering some benefit has an economic value.

This economic value will need to be determined as part of ElectraNet's consideration of credible options. EIi would recommend ElectraNet undertake something like "real option valuation" as part of their assessment.

ElectraNet's credible options

EIi has the following observations in regards to ElectraNet's credible options.

It is not clear that ElectraNet's costings take into account the augmentations to the SA and NSW transmission networks which would be required to deliver the interconnected capacity they are proposing.

As ElectraNet are aware AEMO has concerns over whether a SA HVAC interconnection with NSW would provide a stable system in NSW or Victoria if the interconnector tripped. The AEMO National Transmission Network Development Plan has identified the risk of loop flows on the HVAC network as a result of providing a HVAC interconnector between SA and NSW.

"A connection between South Australia and New South Wales would create a loop between regions"... "which can affect operation of the electricity market. Although the current design has parallel interconnectors between Queensland and New South Wales, and between South Australia and Victoria, one of each pair is DC and is separately dispatchable. Creating a separate AC link between South Australia and New South Wales will require a review of NEM market design."

ElectraNet will need to address this in any further consideration of the interconnector between SA and NSW.

Also in relation to this proposed option EII draw ElectraNet's attention that there is a significant sized biosphere zone along the route that ElectraNet are proposing. Addressing this will involve careful consideration and is likely to increase costs.

Any line or other asset constructed on greenfield sites is likely to introduce significant delays in the delivery of the project. A value for this will also need to be assigned to both ElectraNet's credible options and any alternatives that ElectraNet are likely to receive.

Augmenting the Murraylink interconnector

EII note that Murraylink, by making alterations to its control system, can provide frequency control services (including fast frequency control) to the South Australian market. This would not be reliant on frequency control being provided by generators in Victoria or NSW.

We also draw to ElectraNet's attention that as part of its revenue proposal submission to the Australian Energy Regulator, Murraylink identified a staged contingent project that could be undertaken to augment the capacity of Murraylink.

The Murraylink proposal has a number of advantages:

- The Murraylink upgrade can be staged which creates real option value should circumstances change in the future;

- The Murraylink DC interconnector will be capable of directly providing frequency control services (including fast frequency control); and
- The Murraylink augmentation can utilise existing easements.

Attachment 1 is the section of the Murraylink revenue proposal which provides additional detail on this potential Murraylink augmentation.

Sincerely



Paul Wheeldon

Commercial Manager, Investments

APA Operations (EII) Pty Limited

on behalf of the Murraylink Transmission Partnership

Attachments:

1. Murraylink's revenue proposal section on the contingent project

7.8 Proposed contingent capital expenditure project

The power transfer capability of the Murraylink interconnection is frequently constrained, not by the capacity of the DC link, but by transmission system capability connected to its converter stations in both South Australia and Victoria.

The South Australian Riverland area, the north-western Victorian and the south-western NSW regional transmission networks are all nearing the time when they will need to be reinforced to improve system security and reliability, as well as to provide for the continued effective contribution of Murraylink. The Annual Planning Reports of ElectraNet¹¹⁰, AEMO (Victoria)¹¹¹ and TransGrid¹¹² all describe plans for the staged reinforcement of these regional portions of their networks.

APA has developed a conceptual proposal with three stages, which would be capable of addressing the capacity constraints in the regional transmission networks as well as providing increased South Australian interconnection capacity, as follows.

7.8.1 *Removal of the Murraylink transmission constraint in South Australia*

The first stage would reinforce the connection between Murraylink and the Electranet transmission system.

A new double circuit 275 kV transmission line between Robertstown and Berri, would initially be strung on one side. This line would link ElectraNet's substation at Robertstown to a single 275/132 kV transformer substation located near Berri, with a 132 kV connection to Murraylink's western terminal at Monash.

The cost of this first stage would be approximately \$276 M.

7.8.2 *Duplication of Murraylink*

Both circuits of the Robertstown – Berri 275 kV line would connect to an expanded two transformer substation at Berri. From there, a new DC link (Murraylink 2) with cable and overhead sections would connect between Berri and Buronga in NSW, thereby bypassing the constrained Victorian transmission network.

¹¹⁰ AEMO, Victorian Annual Planning Report Electricity - Transmission Network Planning For Victoria, June 2016, p. 19, 38.

¹¹¹ Electranet, South Australian Transmission Annual Planning Report, June 2016, p. 74.

¹¹² TransGrid, Transmission Annual Planning Report 2016, p. 59.

Murraylink 2 would provide about 300 MW of additional interconnection capacity for export from South Australia and would operate in parallel to the existing link. It would also provide additional import capability to South Australia from NSW and increase the level of support to the regional transmission networks.

Stage 2 of the contingent project would involve an expenditure of approximately \$477 M.

7.8.3 **Capacity upgrade to Darlington Point**

The capacity of Murraylink 2 to both import to and export from South Australia would be limited by the capacity of and losses in the existing 220 kV line between Buronga and Darlington Point.

There are a number of AC and DC options that could be considered to upgrade this connection to a higher capacity. Of these, an estimate of the cost of constructing an additional Buronga – Darlington Point DC line in parallel with the existing line, with a converter station at Darlington Point.

Stage 3 of this contingent project has been estimated to cost \$399 M.

7.8.4 **Contingent Project**

An estimate of the capital expenditure is set out in Table 7.8. These projects are incremental in that each is reliant on the previous increment to provide the capacity stated.

Table 7.8 – Capital expenditure of contingent projects (\$m real 2018)

Project	Total
Removal of the Murraylink transmission constraint in South Australia	266
Duplication of Murraylink	477
Capacity upgrade to Darlington Point	399
Total if all three projects are undertaken	994

This expenditure has not been included in the forecast of capital expenditure in this proposal. It is foreseen that this development could become justified during the next regulatory control period and accordingly it has been included as a contingent project.

It is proposed that the trigger event for this contingent project will be:

- The completion of a RIT-T consultation and cost-benefit analysis that justifies any one, or more than one element of the contingent project to upgrade the capacity of the Murraylink corridor; and

- A financial commitment by the board of Energy Infrastructure Investments Pty Limited to undertake an element of the project.

This arrangement would ensure that any expenditure committed at the time would reasonably reflect the capital expenditure criteria, and take into account the capital expenditure factors.