Hydro Tasmania
The power of natural thinking

Electricity Network Regulation
Productivity Commission
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Submission on Market Network Regulation

Dear Peter Varela,

Thank you for the opportunity to discuss market transmission with the Productivity Commission. We have documented below the answers to the questions which you posed as a result of these discussions. We are happy to provide more detailed responses or hold further meetings if the following responses need further refinement.

1. **DC Merchant Interconnectors**
   What are the main advantages and disadvantages of DC versus AC interconnectors? Is it commercially or technically necessary for a merchant interconnector to be DC in the NEM?

   The principal advantage of a DC interconnector is that the losses are lower over long distances. This is offset by the need for convertor stations which increases the costs. If the distance is sufficiently long then it is economically worthwhile to install a DC line. Because of the convertor stations, it is also difficult to tap into a DC line so this is another consideration.

   For undersea lines, the maximum effective length of AC line which can be achieved is about 100 kilometres. Above this distance, they become very inefficient and it is much preferable to use a DC line.

   Within the NEM, the only market interconnector is Basslink. It was technically necessary for this to be a DC link due to the fact that it operates underwater for almost 300Km. Murraylink and Directlink were both DC links so that they could be registered as MNSPs for reasons explained below.

   The current rules for an MNSP are shown as attachment 1. These are collectively referred to as the "safe harbour" provisions as they describe the requirements for an MNSP and they also prescribe a process whereby an MNSP can change to a regulated link. These safe harbour provisions are the ones invoked by Murraylink and Directlink to convert to a regulated Network Service Provider.

The relevant provision in relation to DC links is section 5 which is shown below:

> (5) the relevant *two-terminal link* through which the *network service* is provided:
>
> (A) does not form part of a *network loop*; or
>
> (B) is an *independently controllable two-terminal link*

In the case of Basslink, it did not form a part of a network loop so it could have been an AC link as far as the rules are concerned but, as noted above, it was necessary for technical reasons for it to be a DC link. In the cases of Directlink and Murraylink, they were part of a loop so were required to be "independently controllable" which in practice is a DC link.

Also note that there is a requirement for an MNSP to be an interregional link (see condition 4).

This form is the only current MNSP specified in the NER today. Any party is able to create a different form of MNSP with another set of conditions if they wish by submitting a proposed rule change. This change will be assessed against the National Electricity Objective by the AEMC and allowed if it passes this criterion. We would, however, see the approval risk and time frame as a significant obstacle to a 'non-standard' MNSP, given project development costs.

2. Treatment of MNSP Losses

You noted that there was differential treatment of Basslink and generators in relation to the application of transmission losses. Could you provide more details (perhaps via an example) as to the nature and effects of this differential treatment?

In 2007, Hydro Tasmania and NEMMCO conducted a joint study into the formulation of the energy balance equation, which was undertaken by IES. The process was initiated by Hydro Tasmania as a result of concerns about how the energy balance equation treated Basslink.

The fundamental issue is whether a SNSP is treated as a generator or a regulated network element in the energy balance equation. This study established that the formulation which AEMO applies treats SNSPs as regulated network elements which has the effect of favouring generators over SNSPs under certain conditions, namely:

- when generators and SNSPs are connected at the same connection point;
- the MLF of the connection point is less than 1; and
- there is a transmission constraint binding.

The energy balance equation ensures that the energy across the NEM is balanced. As electricity must always be in balance between supply and demand, this is an important constraint. Its formulation is complex.

An example is the situation in which there is a transmission constraint in Victoria limiting the dispatch of the LaTrobe Valley generators and Basslink. This is very complex, especially due to the interaction of the SNSP formulation in the energy balance equation. In fact the impact from this formulation is that, when a constraint exists, La Trobe Valley generation bids at the market floor and is favoured over Basslink. Without negative bidding, Basslink will be backed off and eventually forced into counter price flow.

For a fuller explanation of the issue, please see Hydro Tasmania's submission to the AEMC regarding the "Negative offers from scheduled network service providers" Rule change. This submission can be found on the AEMC website at: http://www.aemc.gov.au/Media/docs/Hydro-Tasmania-57408799-0c43-409b-8ff5-ac10c1800118-0.PDF

3. **Use of Settlements Residue Auction**
   Does Hydro Tasmania acquire any inter-regional settlement residues from AEMO's IRSR auctions? How does it use them? How significant are these in its hedging portfolio?

   Hydro Tasmania does acquire inter-regional settlement residues from AEMO's IRSR auctions. Given their non-firm nature, they transact at a discount to firm derivative instruments and so we generally have a portion of IRSR units in our portfolio over the next 3 years.

   In relation to IRSRs, it is our view that they would be more useful as hedging instruments if the Option 4 for constraint formulation had not been adopted. As a result of this change, IRSRs are less firm and to hedge using IRSRs requires the purchase of many more units. The capacity of regulated interconnection is consequently used inefficiently to hedge market exposures.

4. **FCAS and Market Links**
   An independent Basslink (ie independent of Hydro Tasmania) would not be able to receive revenue for the provision of FCAS services. Could you explain what it means for a merchant interconnector to provide FCAS services (ie is it just the mere transport of the FCAS services of generators, or something else)? What impact would being able to receive revenue for FCAS services have on an independent Basslink's total revenue.

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To illustrate: in the case of raise services[1], the ability to provide a raise service means that the provider must be able to generate additional energy or remove load at short notice. A generator which is not running at full capacity is able to do this. In a similar way, if Basslink is flowing south, not at its limit, it is able to provide additional energy into Tasmania by transferring energy from Victoria.

In Basslink, this service is provided by Basslink sensing the frequency in Tasmania and, when it drops, Basslink draws more power from Victoria and holds up the frequency in Tasmania. This mechanism has worked very well and the frequency in Tasmania is much more stable now than it was before Basslink for most of the time. The ability to sense frequency and consequently "transport" FCAS was an additional feature which was added to Basslink and paid for by Hydro Tasmania. Basslink does only transport FCAS and needs generators to actually provide FCAS, otherwise frequency will be affected.

This is how Basslink would physically provide ancillary services. Now we consider the market arrangements.

When Tasmania joined the NEM, a policy decision was taken to have a single FCAS market. This means that when the AEMO dispatch engine solves for a dispatch interval (5 minutes), it considers the FCAS services in all NEM regions. Because ancillary services and energy are co-optimised in this solution, it is possible to have counter price energy flows across Basslink as the least cost overall solution.

The FCAS market is very complex with 8 markets and the ability for some services from one market to be substituted from another service. There is also a **global** requirement (for the whole market) as well as the possibility for a **local** requirement for a specific region. As one example, this local requirement is required for Tasmania to ensure that there is sufficient on-island capability in the event that Basslink trips.

Under the market rules, it was not anticipated that a MNSP would transport FCAS and so no arrangements are in place in the NER for this to happen. More specifically, no charging arrangement is specified in the NER to compensate a MNSP for transporting FCAS. Basslink currently transports FCAS but receives no fee for this service. Further, Basslink's energy transport (and thus its actual market revenue) is reduced to ensure FCAS is carried. Hydro Tasmania has considered this issue in the past and concluded that its extreme complexity and the small materiality of the issue meant that it was not a viable option. As a guide, ancillary services revenues are less than 1% of market turnover.

Murraylink and Directlink both operate in parallel to AC links and, to the best our knowledge, have no facility for transporting FCAS.

[1] Raise services are those which raise the frequency and they are called on when a generator trips off. Previously called "spinning reserve"

Consequently, our view in relation to Basslink remains that rewarding Basslink for the transport of FCAS is not an attractive change and would not impact MNSP's revenues significantly.

5. **Access Holidays**

You supported the availability of 'access holidays' in the gas sector and the beneficiaries pays model of Argentina. Under what circumstances do you see these approaches having a role in the electricity sector?

Access holidays were introduced to remove some of the regulatory hurdles for new gas pipeline investments. It would be fruitful to discover whether there is any opportunity to introduce a similar arrangement in electricity and whether it would provide effective competition in one part of the transmission space. Our initial view is that the heavily networked nature of electricity in contrast to gas makes it impractical. The problem of the spur line of today becoming the shared network of tomorrow is difficult to handle.

In relation to Argentina, the most likely way of introducing their concepts is in the planning domain. The lead times between transmission and generation are mismatched and this means that generation has to follow in the general direction that transmission has set in relation to geography. The Argentinian approach would allow a more market based approach to planning by involving participants in making commitments to potential new investment. Some study would need to be undertaken in Australia to assess whether the lead times are such that this approach can work.

If you require any further clarification, please contact the undersigned.

Yours faithfully,

David Bowker
Manager Regulatory Affairs

Attachment 1: National Electricity Rules Chapter 2

2.5.2 Market Network Service

(a) A *Network Service Provider* may classify a *network service* as a *market network service* if and only if the following conditions are satisfied and continue to be satisfied:

(1) the relevant *network service* is to be provided by *network elements* which comprise a *two-terminal link* and do not provide any *transmission service* which is subject to a *revenue determination* or any *direct control service*;

(2) the *Network Service Provider* is registered under clause 2.5.1 in respect of the *network elements* which provide the relevant *market network service*;

(3) the relevant *network service*:

(A) has not ever been a *transmission service* to which a *transmission determination* has applied or a *direct control service*; or

(B) is ineligible to be such a service;

(4) the *connection points* of the relevant *two-terminal link* are assigned to different *regional reference nodes*; and

(5) the relevant *two-terminal link* through which the *network service* is provided:

(A) does not form part of a *network loop*; or

(B) is an *independently controllable two-terminal link*,

and has a registered *power transfer capability* of at least 30 MW.

(b) A *market network service* is not a prescribed transmission service or a *direct control service* and a *Network Service Provider* is not entitled to impose charges for a *market network service* under Chapter 6 or Chapter 6A.

(c) If an existing *network service* ceases to be classified as a *market network service*, the *AER* may at its discretion determine the service to be a *prescribed transmission service* or a *direct control service*. In that case, the *AER* may make consequential changes to the relevant transmission determination or distribution determination (as the case requires) to accommodate the service.

(d) A *Network Service Provider* is taken to be a *Market Network Service Provider* only in so far as its activities relate to the provision of *market network services*.

(e) For the avoidance of doubt, a *Registered Participant* may apply to the *AEMC* for a *participant derogation* from the conditions specified in clause 2.5.2(a).