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Dear Shilpa

AEMO's Planning Studies 2013 Information and Consultation Paper

TransGrid appreciates the opportunity to provide input into topics of relevance to AEMO's planning functions for 2013. Please find attached a submission providing TransGrid's contribution on each of the topics raised in AEMO's planning studies 2013 information and consultation paper. Among other matters, the submission makes the following key points:

- Further clarity is required on the form and function of the proposed Planning and Modelling Forum, in particular to ensure that subject-matter experts will retain a contributing role to decision-making on relevant topics;
- Opportunities for stakeholders to contribute to development of connection point demand forecasts, regional demand forecasts and any comparison between the two are critical for ensuring that outputs of the forecasting process are as robust and transparent as possible. Transmission Network Service Providers (TNSPs) will have a particular contribution to make to this process;
- There is opportunity to improve how constraint sets are developed and provided in the National Transmission Network Development Plan (NTNDP), in particular through:
 - inclusion of the full set of intra-regional constraints, and
 - consultation on the screening assumptions used to determine the constraint equation sets.
- TransGrid does not consider it likely that there would be value in AEMO exploring short- and medium- term planning issues. AEMO already plays a key oversight role as the National Transmission Planner and through consultation on regulatory investment tests for transmission. However, unlike TNSPs, AEMO does not hold the local knowledge required to capture the synergies available from assessing interactions between various transmission service functions in order to explore short- and medium-term planning options.

TransGrid appreciates AEMO's transparent approach to developing its 2013 planning assumptions. To discuss any of the issues raised in this submission, please do not hesitate to contact Nalin Pahalawaththa on 02 9284 3032 or at nalin.pahalawaththa@transgrid.com.au.

Yours sincerely,



19/3/2013

Stephen Clark
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AEMO planning studies 2013

TransGrid submission in response to
information and consultation paper

19 March 2013

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1 Overview

This submission provides TransGrid's response to each of the issues raised in the Australian Energy Market Operator's (AEMO's) 'Planning studies 2013 – Information and consultation paper' (the Paper). Among other matters, this submission makes the following key points:

- Further clarity is required on the form and function of the proposed Planning and Modelling Forum, in particular to ensure that subject matter experts will retain a contributing role to decision-making on relevant topics;
- Opportunities for stakeholders to contribute to development of connection point demand forecasts, regional demand forecasts and any comparison between the two are critical for ensuring that outputs of the forecasting process are as robust and transparent as possible. Transmission Network Service Providers (TNSPs) will have a particular contribution to make to this process;
- There is opportunity to improve how constraint sets are developed and provided in the National Transmission Network Development Plan (NTNDP), in particular through:
 - inclusion of the full set of intra-regional constraints, and
 - consultation on the screening assumptions used to determine the constraint equation sets.
- TransGrid does not consider it likely that there would be value in AEMO exploring short- and medium- term planning issues. AEMO already plays a key oversight role as the National Transmission Planner and through consultation on regulatory investment tests for transmission. However, unlike TNSPs, AEMO does not hold the local knowledge required to capture the synergies available from assessing interactions between various transmission service functions in order to explore short- and medium-term planning options.

2 AEMO's planning value propositions

2.1 Planning publications

AEMO proposes consolidating its annual planning publications, and lists examples such as the Energy Statement of Opportunities (ESOO), the Victorian Annual Planning Report (APR) and the National Electricity Forecasting Report (NEFR).

In any consolidation, TransGrid considers that significant value will be obtained by separating the documents relevant to national planning from the documents relevant to jurisdictional planning. That is, the ESOO and NEFR reports are undertaken in order to contribute to AEMO's role as National Transmission Planner and so it may be appropriate for them to be consolidated into a single document. However, the Victorian APR is undertaken as part of AEMO's unique transmission planning role in Victoria and it would be inappropriate for it to be included in a document about national planning. Separation of the two will allow focus and attention to be paid to material issues without confusion.

2.2 Planning and Modelling Forum

AEMO proposes the introduction of a Planning and Modelling Forum. The Paper notes that the forum will 'streamline' industry working groups on planning matters, and also that the forum will 'coordinate the activities' undertaken by the existing industry working groups. As the form and function of the forum is developed, TransGrid would appreciate further clarity on:

- the structure of the forum,
- the members of the forum,
- the structure of the new working groups and how they would relate to the existing working groups and the newly-established forum, and
- members of the working groups

TransGrid considers that it is critical for the appropriate expert from each TNSP to be given full opportunity to take part in decision-making relevant to their area. As the responsibilities of the forum are decided, caution should be applied before moving decision-making away from subject matter experts.

2.3 Energy forecasting

AEMO has proposed additional developments to its national demand forecasting process, currently published in the NEFR. This work is to include developing a consistent methodology for transmission connection point forecasting across the National Electricity Market (NEM), with a view to considering comparison between AEMO's regional demand forecasts and Distribution Network Service Providers' (DNSPs') aggregated connection point forecasts at some point in the future.

TransGrid notes that detailed consultation on this matter will take place via an industry reference group or the Planning and Modelling Forum, and so here provides only high-level comments on development of connection point demand forecasts, development of regional demand forecasts, and comparison of the two.

Connection point forecasts

It will be imperative that if AEMO develops its own connection point forecasts, the roles of TNSPs, DNSPs and AEMO in the connection point development and publication process are made explicit.

Under the National Electricity Rules, TNSPs are currently obliged to collect connection point forecasts from market participants, including DNSPs, for publication in their APRs. As part of this process, TransGrid collaborates with the NSW DNSPs to provide a high-level review of their connection point demand forecasts, where appropriate.

When AEMO also begins to prepare connection point forecasts, it will be necessary to make clear what role if any TNSPs will play in the interaction between AEMO and the DNSPs, given that a high degree of information-sharing will be required for AEMO to glean the necessary local knowledge for developing a connection point forecast. *Prima facie*, it would appear that 'doubling up' of this process (which already occurs between TNSPs and DNSPs) would be inefficient. TransGrid recognises that inevitably there will be some duplication of work and effort required until the various responsibilities, roles and processes are clarified. TransGrid looks forward to working together with AEMO to resolve any issues as early as possible, with the aim of reducing inefficiency.

Regional forecasts

Any forecasting project of the dimension of that undertaken by AEMO requires methodical planning, extensive stakeholder consultation and timely execution. TransGrid is keen to be associated with AEMO's national forecasting project and collaborate with AEMO to make the forecasting process and the final outputs as robust and transparent as possible.

When requested by AEMO, TransGrid provides inputs such as energy and maximum demand data, industrial load data, information on existing and new embedded generation, and feedback on AEMO's modelling processes.

As AEMO continues to develop its regional demand forecasting processes, TransGrid would like to highlight the following issues.

- **Importance of recent economic data** – the economic and demographic forecasts undertaken by AEMO are key inputs into total energy and maximum demand forecasts. TransGrid considers that in times of volatile economic conditions, the economic forecasts should be undertaken using the *latest* available actual data wherever feasible.
- **Need for improved consultation on inputs before finalisation of forecasts** – TransGrid considers that there is scope for improved consultation with interested and informed stakeholders about the methods and input information used for AEMO's forecasts. Before the forecasts are finalised by AEMO, TransGrid recommends that a formal consultation be introduced (either by reinstating the Load Forecasting Reference Group or through another appropriate mechanism). Three areas where TransGrid in particular would be interested to provide input and verification ahead of finalisation of the forecast are:
 - economic inputs and the growth scenarios being considered for the economic and demographic forecasts undertaken by AEMO,
 - historical large industrial demand information used as an external input into the forecasting process, and
 - local information required to accurately interpret and effectively use the historical energy and maximum demand figures which are inputs into the energy and peak demand models. It is imperative that the historical energy information is checked and verified before it is used in modelling.
- **Breakdown of native energy** – in previous years AEMO provided a detailed breakdown of Native energy into its Scheduled, Semi-scheduled and significant Non-scheduled components. However no breakdown was provided in the 2012 NEFR. A detailed breakdown of the native energy forecasts helps to understand the dynamics within the energy market, especially with regard to the renewable energy market. It is hoped that the breakdown will be made available in future AEMO publications.
- **Backcasting procedures** – validation of model results is critical for ensuring the robustness of models used by AEMO for forecasting. It is expected that AEMO will continue to perform appropriate backcasting procedures to test the divergence of forecasts from historical actuals.

Comparison of regional and connection point forecasts

By way of general comment on comparison of top-down (regional) demand forecasts and bottom-up (connection point) demand forecasts, TransGrid notes that variance has historically occurred primarily because the forecasts are performed on different bases. Going forward, it will be important that a standardised and transparent industry procedure is established to enable a meaningful comparison of the forecasts. A connection point forecast which takes into account the relevant economic activities at the local load centres and future market scenarios similar to those used for creating the regional forecasts may be an option to consider.

TransGrid will be eager to contribute to the development of a process for comparing forecasts, as the outcomes of this process will be a direct input into TransGrid's planning functions and responsibilities.

3 Input modelling and assumptions

There are two areas where TransGrid would appreciate further information on the 2013 planning input modelling and assumptions:

- **Development of forecast demand traces** – as indicated at the 28 February 2013 meeting of the Market Simulation Working Group, AEMO is not planning to update the market modelling for the 2013 NTNDP as the input forecast demand traces and other market drivers have not significantly changed since 2012. However, in order to inform its own market modelling for regulatory investment tests for transmission and planning purposes, TransGrid would appreciate greater transparency of the methodology used to develop the forecast demand traces. This could include a description of the input assumptions entered into the PLEXOS market model, and an explanation of how these are related to the demand traces which form the output of the model.
- **Siting of new wind generation entrants** – If available and possible, TransGrid would appreciate higher-resolution information about AEMO's modelling of potential new wind entrants into the generation market. In particular more information about potential siting would be appreciated.

3.1 NEM power station emission factors

TransGrid has no comments to make on this topic.

3.2 Changes to electricity supply-demand outlook modelling

TransGrid does not see any issues with AEMO's proposal to discontinue the publication of the Supply Demand Calculator.

4 National Planning documents

TransGrid recommends that the following areas be considered for inclusion in the scope of work for the 2013 NTNDP, in order to assist jurisdictional planning bodies and other stakeholders in the planning process.

- **Provision of intra-regional constraint set** – In the 2010 NTNDP, AEMO provided network constraint equations that took into account both system normal inter-regional and intra-regional limitations. However, the 2012 NTNDP only provided system normal inter-regional constraint equations and a limited set of intra-regional constraint equations. The full set of intra-regional constraints is required to comprehensively assess the market impact of network augmentations that increase the transfer capacity between regions. The lack of provision of intra-regional constraints could lead to over-stating the market benefits from a proposed inter-regional augmentation. Hence, TransGrid requests that the full intra-regional constraint set be included in the 2013 NTNDP.
- **Consultation on development of the constraint set** – TransGrid notes that some constraints relevant to some of its potential projects have not appeared in the intra-regional constraint sets published in the NTNDP in recent years. This could be due to the assumptions AEMO uses in setting up its loadflow analysis when it determines the constraint set. TransGrid would appreciate the opportunity to consult on the screening assumptions used by AEMO to determine which constraint equations will be included for the forward looking market simulation studies.

- **Naming of constraints** – in the constraint set currently being consulted on via the TNSP planning coordination function, ahead of inclusion in the 2013 NTNDP, there appears to have been changes to the way in which constraints are referred to and named. TransGrid recommends that either AEMO revert to the National Electricity Market Dispatch Engine (NEMDE) naming convention for constraint equations, or that an interpretation guide for the new convention be included in the 2013 NTNDP.
- **Presentation of constraints** – in addition to the constraint workbook which will accompany the 2013 NTNDP, TransGrid would appreciate the inclusion of a ‘plain English’ listing of the inter-regional constraints. Such a listing would provide ease of reference and understanding for planners and interested stakeholders. An example of such a listing is included in Attachment 1.

4.1 Integrating short-term and long-term planning

TransGrid does not consider it likely that there would be value in AEMO exploring short- and medium- term planning issues, as proposed in the Paper. AEMO already plays a key oversight role in the transmission planning space. AEMO’s role as National Transmission Planner requires focus on inter-regional transmission flow paths and informing the market of long-term planning issues. In addition, avenues where AEMO already provides input to short- and medium- term planning issues include consultation on regulatory investment tests for transmission and its role in providing advice to the Australian Energy Market Commission in meeting its Last Resort Planning Power responsibilities.

However, unlike jurisdictional TNSPs, AEMO does not hold the local knowledge required to undertake the short- and medium-term transmission planning function. This role is better placed with jurisdictional planning bodies, as they have the knowledge required to assess the interaction of augmentation investment decisions, network support contracts, replacement investment decisions, asset refurbishment decisions, and asset operation and maintenance decisions when exploring transmission planning options. This assessment of interactions allows synergies to be captured across the various transmission services.

However, TransGrid does recommend that as part of its system operations role AEMO consider opening consultation on its existing Power System Adequacy Report. Such consultation could seek to confirm that the report is providing appropriate and sufficient information about power system capability and its impact on medium-term system security and reliability, in order to assist the jurisdictional planning bodies’ short- and medium-term planning.

4.2 Scenario modelling

4.2.1 Demand forecasts

As discussed via the Market Modelling Reference Group, TransGrid considers that provision of demand traces for the Fast Rate of Change scenario and the Decentralised World scenario would add value to the 2013 NTNDP.

4.2.2 Gas fuel prices, carbon prices and integrating renewable generation

TransGrid has no comments to make on these topics.

Appendix 1 Example listing of inter-regional constraints

Figure – Example of ‘plain English’ listing of inter-regional constraints

The examples below are provided to demonstrate a potential format only, and should not be considered as a current representation of inter-regional constraints between NSW and Queensland.

Table 4 - 7: NSW Export to Queensland Voltage Stability Equations

MEASURED VARIABLE	COEFFICIENT	
	Liddell-Muswellbrook Contingency	Largest Unit in Queensland Trip
Constant term (intercept)	-900	-700
Muswellbrook 132kV MW demand	-0.8	-
Tamworth 132kV MW demand	-0.8	-0.23
Armidale 132kV MW demand	-0.8	-0.63
Lismore 132kV MW demand	-0.8	-0.63
Coffs Harbour 132kV MW demand	-0.8	-0.63
Liddell 330kV bus voltage (pu)	2000	1800
Total MVar shunt capacitors in Tamworth and Armidale	-	0.32
Total MVar shunt reactors in Tamworth and Armidale	-	-0.32
Generation MW from highest generating unit in Qld	-	-0.9
Active power transfer (MW) across Directlink (1)		0.37

Note:

(1) Positive transfer denotes northerly flow.

Table 4 - 8: NSW Export to Queensland Transient Stability Equations (Hunter Valley Fault, NSW Export to Snowy/Victoria)

MEASURED VARIABLE	COEFFICIENT (1)							
	Hunter Valley Line Fault (≤7 Hunter Units)	Hunter Valley Line Fault (≤7 Hunter Units)	Hunter Valley Line Fault (8 Hunter Units, SA import)	Hunter Valley Line Fault (8 Hunter Units, SA import)	Hunter Valley Line Fault (8 Hunter Units, SA import)	Hunter Valley Line Fault (8 Hunter Units, SA export)	Hunter Valley Line Fault (8 Hunter Units, SA export)	Hunter Valley Line Fault (8 Hunter Units, SA export)
Constant term (intercept)	700	11067	630	980	23180	520	860	23180
Active power transfer (MW) across NSW to Snowy Interconnector	-0.075	-8.7143	-0.15	-0.5	-19	-0.06	-0.4	-19
Active power transfer (MW) across Directlink (2)	0.22	0.22	0.1	0.1	0.1	0.22	0.22	0.22
Equation Lower Limit	-	0	-	-	0	-	-	0

Notes:

(1) Equations apply for southerly flows from NSW to Snowy and Snowy to Victoria. Additionally, these equations cover cases of northerly power flow from Snowy to NSW and southerly from Snowy to Victoria – however in this case the NSW to Snowy Flow term is set to 0.

(2) Positive transfer denotes northerly flow.