TRANSITIONAL ACCESS ROUND 2 REPORT

FOR THE NATIONAL ELECTRICITY MARKET

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IMPORTANT NOTICE

Purpose

AEMO has prepared this document to provide information about transitional access allocation under a proposed methodology as part of the Australian Energy Market Commission's optional firm access design.

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TABLES

1 BACKGROUND

The Optional Firm Access (OFA) model requires that a transitional access (TA) allocation is established, which determines the initial level of TA allocated to existing generators at the commencement of the OFA regime. This initial access allocation will be set at a level so that each Transmission Network Service Provider (TNSP) is firm access standard (FAS) compliant at OFA commencement.

In May and June of 2014, AEMO undertook a series of tests of methods to allocate TA to existing generators if OFA were to be introduced. The results and method used were presented by AEMO in Appendix B of the AEMC's First Interim Report of the OFA design and testing review, and published on the AEMC's website.[1]

Following review of the results from these tests, the AEMC have requested AEMO undertake four further tests based on the method used previously.

These test runs for the second round are:

- rerun of base case;
- removal of Wallerawang No. 7;
- two step model; and
- flows across interconnectors.

This round of testing did not include modelling of Tasmania or consideration of methods to model future network scenarios.

AEMO has completed the second round of tests using the dispatch interval used as an input for the original base line test, which was 15:00 on 15 January 2014.

This document has been provided to the AEMC for the express purpose of assisting their understanding of the Transitional Access methodology proposed in the TFR.

[1] See: http://www.aemc.gov.au/getattachment/441c900e-e0b8-4e8d-9cf8-bee5fd41ee29/AEMO-Transitional-Access-Allocation-Report.aspx

2 METHODOLOGY

The methodology used is the same as described in section 2 of the first round test report with the following exceptions.

2.1 Dispatch Model

AEMO has used the same dispatch model as used for the first round of testing described in section 2.1 of the first round test report.

2.2 Dispatch Inputs

Generators and Basslink

As described in section 2.3 of the first round test report, except:

- Historical generator and Basslink peak output is based on half-hourly average dispatch targets (previously used 5-minute dispatch targets to derive peak outputs).
- Peak output is then capped at maximum capacity, using AEMO registration data at October 2014.

2.3 Scenarios

a) Re-run of base case: The base case was re-run once as a control sample.

b) Wallerawang: Repeat of case a) without Wallerawang No.7 unit in NSW.[2]

c) Two step model: Undertake a two-step investigation. Step one is to optimise the base scenario without additional load at the regional reference node. Step two is to run the base scenario with minimum constraints applied to all generators at levels from Step one. Wallerawang No.7 unit was excluded in this run.

d) Interconnectors: Undertake series of runs which allocate a proportion of transitional access to interconnectors. Wallerawang No. 7 unit was excluded in this run.

The interconnectors scenario required AEMO to lock interconnector flows at the availabilities of Settlement Residue Auction (SRA) units as shown in Table 1.

[2] This unit was deregistered after the first round testing was completed. This test was expected to result in additional access to generators in the NSW Snowy sub-region. On 8 December, EnergyAustralia gave notice that Wallerawang No.8 unit is also to be deregistered with immediate effect. Although not studied, the deregistration of Wallerawang No.8 unit in NSW would be expected to have a similar additional effect as Wallerawang No.7. See section 4.1.

Table 2-1 SRA units for each direction of each interconnector

Interconnector	Flow amount (MW)
QNI (north)	434
Directlink (north)	116
QNI (south)	994
Directlink (south)	206
Vic-NSW (north)	1300
Vic-NSW (south)	1500
Heywood (east)	284
Murraylink (east)	116
Heywood (west)	474
Murraylink (west)	226

3 MODELLING ISSUES

This section discusses issues identified in the second round testing. See also the equivalent section in the first round testing report.

3.1 Input Assumptions

The second round test used different input data for generator capacities, based on half-hourly average dispatch targets and a different two-year horizon. This has resulted in a reduction in the total capacity of plant available for allocation, which has resulted in an increased proportional allocation to sub-regions that were constrained in the first round testing.

The overall difference is 2% lower than for the first round, although there were large differences in some sub-regions as shown in Table 1.

Table 3-1 Round 2 Sub-Region Capacity Differences Larger than 3%

Sub-Region	Round 2 Capacity	Reduction compared to Round 1	
SESA	311 MW	30 MW	9%
SNSW	728 MW	49 MW	6%
Brisbane	929 MW	49 MW	5%
Mel	1156 MW	53 MW	4%
NVIC	702 MW	30 MW	4%
NQ	1043 MW	38 MW	4%
Adelaide	2392 MW	63 MW	3%
Latrobe Valley	7807 MW	200 MW	3%

3.2 Interconnector Access

The interconnector access scenario has identified modelling issues using a fixed starting point to determine access for all directions of flow. The issues identified are:

- The base input dispatch interval occurred when Victoria was experiencing near record peak demand due to extremely hot weather in Victoria. Exports from Victoria to South Australia via the Victorian outer grid (supplying towards Murraylink via north western Victoria) was restricted at the time and some constraints were already violating. This meant the capacity of the Victorian network to export toward South Australia and New South Wales was already limited before the case was run.
- Stability constraints are often dependent on the configuration of the transmission network, such as the number of capacitors in service and the power system voltage at critical points on the network. These factors will change depending on whether the region is importing or exporting. The base input dispatch interval had a large transfer from Queensland to NSW, which appears to be have interfered with the ability to achieve a large flow from NSW to Queensland.
- Summer thermal ratings are generally lower than winter or night-time ratings. The maximum capacities used for the SRA are nominal ratings that are more likely to be achieved under favourable conditions (such as cooler temperatures).

4 RESULTS

4.1 Base Case and Wallerawang Case Results

For the most part, the round 1 and round 2 results using similar input assumptions are consistent with each other. The round 2 results are less constrained as a proportion of their capacities than round 1. This is a result of two factors:

- Capacities in round 2 were lower, increasing the percentage allocation in sub-regions with unchanged or slight lower MW allocations.
- The lower overall capacity being allocated in some unconstrained sub-regions allowed higher MW allocations in constrained sub-regions.

Table 4-1 Summary of Base-Scenario TA Allocation

Sub-Region	Round 1 Base	Round 2 Base	Round 2 No Wallerawang #7
Northern Queensland	100%	100%	100%
Central Queensland	99%	99%	99%
Brisbane	100%	100%	100%
South Western Queensland	84%	86%	86%
Hunter Valley NSW	100%	100%	100%
Central Coast NSW	100%	100%	100%
Sydney	100%	100%	100%
Western NSW	100%	100%	100%
Southern NSW	100%	100%	100%
NSW Snowy	63%	68%	75%
Victoria Snowy	100%	100%	100%
Northern Victoria	87%	89%	89%
Latrobe Valley	95%	96%	96%
Melbourne	86%	86%	86%
Western Victoria	100%	100%	100%
South-Eastern South Australia	90%	99%	99%
Adelaide	100%	100%	100%
Northern South Australia	97%	100%	100%

The largest difference is in South-Eastern South Australia, which has been allocated 9% more access in round 2 compared to round 1. The round 2 capacity of 311 MW is 30 MW lower than in round 1, and entirely accounts for the higher proportional allocation.

NSW Snowy was allocated 5% more access in round 2 compared to round 1. This was due to lower overall capacities in NSW in the other sub-regions, which freed up access to the critical constraint in NSW.

The Wallerawang No.7 scenario reduced the overall capacity in Western NSW, which also freed up access to NSW Snowy sub-region and resulted in a further 7% increase in allocation. As expected, no other regions were affected by this scenario. Although not studied, the deregistration of Wallerawang No.8 unit in NSW would be expected to have a similar additional effect as Wallerawang No.7, probably increasing NSW Snowy sub-region allocation to about 82%.

4.2 Interconnector Access Results

Interconnector access specified by the AEMC could not be achieved in all cases. The reasons for this are discussed in section 3.2. Table 4-2 shows the achieved interconnector flows for each scenario. Table 4-3 shows the changes to sub-regional allocations due to interconnector allocations (unaffected sub-regions not shown).

Table 4-2 Interconnector Results

Interconnector	Target	Achieved	Base	Comment
QNI north	434	122	(south)	Voltage stability constraint in northern NSW
Directlink north	116	31	(south)	Voltage stability constraint in northern NSW
QNI south	994	994	761	
Directlink south	206	102	71	Limited by summer ratings
Vic-NSW north	1300	-23	(south)	Limited by Victorian outer grid
Vic-NSW south	1500	1413	503	
Heywood east	284	284	(west)	
Murraylink east	116	77	77	Limited by Victorian outer grid
Heywood west	474	460	295	
Murraylink west	226	-77	(east)	Limited by Victorian outer grid

Table 4-3 Interconnector Impacts on Sub-region Allocations

Sub-Region	Round 2 Wallerawang	After Interconnector Allocation	Comment
South Western Queensland	86%	84%	Due to imports from NSW
NSW Snowy	75%	73%	Due to imports from Queensland
Victoria Snowy	100%	13% (Vic import) 16% (SA import)	Due to imports from NSW
Northern Victoria	89%	82%	Due to imports from NSW
Western Victoria	100%	89%	Due to imports from NSW
South-Eastern South Australia	99%	8%	Due to imports from Vic
Northern South Australia	100%	98%	Due to imports from Vic

Observations

Although the target flows were not able to be achieved in all cases, the results can be explained in terms of network capabilities. The modelling issues identified in section 3 are thus due to the capability of the network to deliver the desired flow using actual system conditions as a starting point, rather than an indication of the suitability or otherwise of using NEMDE to determined transitional allocation.

Specific impacts include:

- NSW Snowy sub-region had 2% lower level of access allocated. This is because flows from Queensland into NSW tend to increase the flow on the critical constraint into Sydney from the south.

- The Victoria import case, with 1775 MW combined from NSW and South Australia, had a large impact on allocations to Vic Snowy, Northern Victoria and Western Victoria. These are consistent with the Victorian network capacity under extreme weather conditions and the level of import.
- South East South Australia and, to a lesser extent, Northern South Australia were affected by imports on the Heywood interconnector from Victoria. In addition, because much of the additional power was sourced from New South Wales, Victoria Snowy was also impacted by the South Australia import case.

4.3 Two-Step Results

The two-step scenario was requested by AEMC in response to stakeholder feedback on the results of the round 1 results. AEMO used the Wallerawang No.7 scenario to examine the 2 step process. The combined effect of this outage and the use of half-hourly average maximums to determine maximum allocation has resulted in near-identical results for the round 2 Wallerawang scenario and the two-step results.

The only difference was within the NSW Snowy sub-region, which saw some changes of allocation between Snowy Hydro units and a wind farm.

Table 4-4 Two-Step Results

Sub-Region	Round 2 Wallerawang	Step 1	Step 2
Northern Queensland	100%	54%	100%
Central Queensland	99%	54%	99%
Brisbane	100%	54%	100%
South Western Queensland	86%	54%	86%
Hunter Valley NSW	100%	73%	100%
Central Coast NSW	100%	73%	100%
Sydney	100%	73%	100%
Western NSW	100%	73%	100%
Southern NSW	100%	73%	100%
NSW Snowy	75%	73%	75%
Victoria Snowy	100%	100%	100%
Northern Victoria	89%	89%	89%
Latrobe Valley	96%	74%	96%
Melbourne	86%	63%	86%
Western Victoria	100%	75%	100%
South-Eastern South Australia	99%	65%	99%
Adelaide	100%	65%	100%
Northern South Australia	100%	65%	100%

5 CONCLUSIONS

The round 2 studies used a similar methodology to that used in round 1. Generation maximum capacities in round 2 were based on half-hour averages and were capped at the registered maximum capacities, which resulted in a higher proportion of capacity allocation in constrained sub-regions.

The two-step methodology was successfully demonstrated using the Wallerawang No.7 case and also shown to be stable and repeatable. The method produced a marginal change in allocation between units within the NSW Snowy sub-region, but was otherwise the same as the Wallerawang No.7 case (and higher than the Round 2 case).

The interconnector scenarios were significantly dependent on the initial conditions determined by the base case scenario, which was from a Victorian peak demand case in January 2015. This suggests a single base-case scenario is not suitable for determining transitional allocation to interconnectors.