

8 May 2012

Mr Jonathan O'Dea
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Dear Mr O'Dea

**NSW Legislative Assembly – Public Accounts Committee
Inquiry into the Economics of Energy Generation - Questions Taken on Notice**

I refer to the three questions on notice addressed to Mr David Swift following his appearance before the Public Accounts Inquiry into the Economics of Energy Generation on Monday 26 March 2012. Mr Swift will be unavailable to address the questions until mid-May 2012, and in his absence I am providing the following answers to avoid a delay. If further clarification is required following consideration of the material provided here, I anticipate that Mr Swift will be happy to assist following his return.

***Question 1:** On page 2 of your submission you referred to a study being carried out to consider the market and transmission implications of increased use of renewable energy. Can you provide some information about the first round of work for this study? [p. 15, Mr Bart Bassett]*

AEMO's 2011 National Transmission Network Development Plan (NTNDP) contains general information on international practices, including technical standards that must be met if connecting to the network, wind variability information and network congestion studies. The studies found that the market arrangements in the National Electricity Market (NEM) are well suited to the integration of wind generation. Favourable characteristics include the short 5-minute dispatch interval, semi-dispatch arrangement for wind generation, a wind forecasting mechanism that is integrated into the generation dispatch process, and dedicated frequency control markets. The technical standards for generation connections covering wind generation are largely consistent with international practice. Some potential improvements have been identified in the areas of inertia and frequency control, to manage further large-scale integration of wind generation in some parts of the network.

***Question 2:** Can you provide information on the accuracy of the Australian Wind Energy Forecasting System? [p. 15, Mr Bart Bassett]*

The Australian Wind Energy Forecasting System (AWEFS) is used to forecast the output of each significant wind farm in the NEM over forecasting timeframes ranging from 5 minutes to 2 years. These wind energy forecasts are then used as an input to AEMO's demand forecasting systems, including the day-ahead predispach forecast which assists market participants to plan the operation of non-intermittent plant, and supports AEMO's oversight of power system reliability and security.

It is important for these forecasting tools to be as accurate as possible. AWEFS has been developed, implemented and refined by AEMO and its predecessor, NEMMCO, with funding assistance from the Commonwealth.

The AWEFS becomes progressively more accurate as the forecasting horizon reduces. At 40 hours ahead, the mean absolute percentage error in wind generation forecasts is about 6% when measured across the NEM and averaged across the year. At 1 hour, the accuracy is 2.5%, and at 5 minutes it is about 0.8%. These accuracy measures benefit from the geographical diversity of wind across the NEM, so the accuracy is not as high when forecasting the output of individual wind farms. The 40 hour ahead accuracy for New South Wales alone is approximately 12%, and this will improve as the number of wind farms increases. In South Australia, which has more wind farms, the accuracy for 40 hours ahead is approximately 7.5%.

Question 3: Can you provide details from your modelling regarding the impacts of the carbon tax on electricity generators in New South Wales? [p. 17, Dr Geoff Lee]

AEMO's most recent comprehensive long-term modelling exercise was for the December 2010 NTNDP, which covered a span of 20 years. Detailed information on these modelling results can be found on AEMO's website at the following address:

<http://www.aemo.com.au/Electricity/Planning/2010-National-Transmission-Network-Development-Plan>

The modelling included three future carbon price trajectories applied across five economic scenarios. It should be noted that AEMO's objective in producing the NTNDP is to assess the range of market investments that might emerge (or retire), and to use that as a guide for national transmission planning. The NTNDP did not evaluate financial impacts of the clean energy act upon existing participants.

The outputs of the modelling, by volumes of energy generated, and the entry and retirement of capacity, can be reviewed by State and by fuel type for each scenario, through the AEMO website by accessing the following spread sheets of "Output information from the Market Simulations":

- Simulated generation expansion and retirements
- Capacity factors, emissions, and energy production

These spread sheets present the results graphically, and are accessed at this website page:

<http://www.aemo.com.au/en/Electricity/Planning/2010-National-Transmission-Network-Development-Plan/2010-NTNDP-Data-and-Supporting-Information/Market-Simulation-Results>

If you should have any queries, please do not hesitate to contact David Swift on 08 8201 7371 or david.swift@aemo.com.au.

Yours sincerely



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