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# TREASURY MEETING BRIEF

8 August 2017 PDR No. MS17-002434

Treasurer

FOI 2647
Document 1

## MEETING WITH DELTA ELECTRICITY

**Timing:** For your meeting on 9 August at 12:30 PM with Trevor St Baker and Brian Flannery from Delta Electricity

## KEY POINTS

- We understand that Trevor St Baker, the Chairman of Delta Electricity (DE) met separately with the Prime Minister and Minister Frydenberg yesterday. In these meetings, DE expressed their continued support for investment in coal fired power stations to meet baseload energy demand, a moratorium on new investment in renewable generation, and reduced foreign ownership in the electricity sector.
- s45
  - DE currently own the Vales Point black coal power station (1,240 MW) on the New South Wales central coast and is one of several bidders for LYB (owned by Engie). LYB is estimated to be valued at $1 billion and final bids are due at the end of August.
- Treasury considers that we should not provide any assurances to DE at this stage. Treasury notes that it is far from certain that there will be a shortfall of baseload power in the medium term, and as such new baseload generation may not be required going forward.
  - Falling demand across the National Electricity Market (NEM), rising share of renewables, and existing and proposed reserve mechanisms will mean that flexible dispatchable generation (e.g. gas generation) will likely be more competitive than baseload power (e.g. refurbished coal or HELE retrofits).
  - Retiring generation capacity will also be offset by incoming renewable and dispatchable generation capacity.
    - : Although 2.45GW of generation capacity is likely to retire within five years, more than 4GW is expected to replace it over this period.
- Further to the above, Australian Energy Market Operator (AEMO) was requested by Minister Frydenberg in June 2017 to report to both the Government and the COAG Energy Council on the adequacy of current and forecast levels of dispatchable generation capacity to ensure the NEM continues to meet the reliability standard over the next ten years.
  - AEMO has also been requested to provide advice on the need for new mechanisms to incentivise additional dispatchable generation capacity that complement existing mechanisms, and those recommended by the Finkel review.
  - AEMO is due to report by 1 September 2017 but no decision on this advice is required from Government and the COAG EC before the end of 2017.

- Treasury supports the continued implementation of the Finkel Review's recommendations that will deliver investment in new dispatchable generation capacity offsetting the impact of expected generator closures over the next five years.
  - The Clean Energy Target would incentivise investment in new dispatchable generation capacity that places downward pressure on prices and ensures continued reliability.
  - The three-year notification of closure rule will mitigate market price impacts from the exit of large generators.
  - The Generator Reliability and Energy Security Obligations as per the agreed-to Finkel recommendations (currently being considered by the AEMC) will likely incentivise solutions, which offset the need for baseload generation to meet system security requirements.

**Foreign Investment**

- s45
  - On 21 April 2017, you approved Chow Tai Fook Enterprises' application to purchase Alinta Energy.
- s45

s 22

Contact Officer: s 22 Ext: s 22

Senior Adviser
Structural Reform Group
s 22

# ADDITIONAL INFORMATION

s 47G(1)(a) +(b)

# TREASURY MINISTERIAL BRIEF

20 September 2017 PDR No. MS17-003023

Treasurer

## HUNTER VALLEY VISIT BRIEF – DELTA ELECTRICITY

**Timing:** Prior to your visit to the Hunter Valley on Monday 25 September.

## KEY POINTS

- During your travel from Monday 25 September to the Hunter Valley, you will be visiting the Vales Point power station owned by Delta Electricity.
- Vales Point is a coal-fired power station of 1320 MW. At 39 years old it is the second oldest coal plant in New South Wales and the fourth oldest in the NEM. In 2015, the New South Wales government sold Vales Point power station for only $1 million to Sunset Power International Pty, who operate the plant as Delta Electricity.
- Delta Electricity's chairman is Trevor St Baker, and its director is Brian Flannery, both of whom you met with on 9 August 2017 (MS17-002434 refers).
- s45
- Treasury advises against providing or hinting at providing any assistance to Delta in relation to LYB or to any of their existing assets including Vales Point.
  - Doing so would further encourage electricity generation companies to try and offset their private investment with public assistance.

s45

- The identity of the foreign investors will inform our recommendations to you on conditions you might wish to impose should you approve the transaction.
- s45
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- Treasury considers that we should not provide any assurances to Delta regarding LYB on foreign ownership review, and we should discourage any interest they display in seeking government assistance for LYB, Vales Point, or any of their other generation assets.
  - The best way to address potential shortfall or reliability issues in the NEM is to develop stable market frameworks that facilitate market investment.
  - Unpredictable and piecemeal approaches to energy policy are the largest barrier to investment in new generation projects or coal retrofits, and ad hoc interventions or assistance measures may worsen affordability and reliability over the longer term.

s 22

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**Consultation:** SRG - Competition; Foreign Investment Review Unit

## ADDITIONAL INFORMATION

- s45 [redacted]
  - On 21 April 2017, you approved Chow Tai Fook Enterprises' application to purchase Alinta Energy.
- s45 [redacted]

s 22

**From:** McDonald, Hamish
**Sent:** Wednesday, 27 September 2017 3:43 PM
**To:** 'John Short'
**Subject:** RE: Follow up on recent meeting with owners of Delta Electricity [SEC=UNCLASSIFIED]

Thanks John

It was great to see you again last week, and it is really useful to receive this sort of information.

The points about the cost of firming up renewables and the need to consider capacity factors are well made. One thing though, I think that most LCOE figures we see do adjust for capacity factors (but generally not additional firming).

I must admit, I find that the complexity of the space, the site and asset specific issues and the changing nature of the technology all tend to highlight to me the value of the principle of trying to set technology neutral policy frameworks that value the things we need to value, and letting the participants identify the most cost effective solutions.

Cheers
Hamish

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**From:** John Short [mailto:s47F ]
**Sent:** Tuesday, 26 September 2017 6:19 PM
**To:** McDonald, Hamish
**Subject:** Follow up on recent meeting with owners of Delta Electricity

Hamish,

Thank you for meeting with the owners of Delta Electricity, Trevor St Baker and Brian Flannery, and myself last week.

Regrettably I did not think that we fully addressed the issues you raised at the outset of the meeting - and, therefore, I thought it appropriate to now address some of those issues in greater detail.

Also the Treasurer was not able to inspect the Delta Electricity power plant at Vales Point on Monday as originally planned, so I thought it would be appropriate to pass on the information on the cost of re-furbishing an existing plant that we had planned to present to the Treasurer.

s 47G(1)(a) +(b)

## NAMEPLATE CAPACITY VERSUS ENERGY OUTPUT

As I am sure you are aware, there is a major difference between nameplate capacity and energy output - but many people assume, either explicitly or implicitly, that these 2 concepts are the same when, clearly, they are not.

But it is worthwhile pointing this out as the most recent correspondence from AEMO to the Energy Minister effectively equates nameplate capacity with energy output - which I will expand on below.

The rough rule of thumb used in the energy sector is that the average annual capacity of wind farms, subject to their specific location, is 30-40%.

And the rough rule of thumb for solar farms is an average capacity of around 25%.

So a 150MW wind farm would have an energy output of around 50MW, while a 150MW solar farm would have an energy output of approx 37.5MW.

A well run coal-fired generator would have an average capacity rate of 85%+, so a 150MW coal fired generator (as an illustration) would have an energy output of around 127.5MW - so in excess 2 times the energy output of the illustrative wind farm and in excess of 3 times the energy output of the illustrative solar farm.

It was therefore very interesting to see that in the 4 September 2017 letter from the AEMO CEO to the Energy Minister on Dispatchable Capability, there was no distinguishment made between nameplate capacity and energy output when running through, at page 2, the changes in NEM generation sources over the last 10 years and the resultant impact of the closure of 5199 MW of baseload over the past decade and the replacement of this baseload with a variety of new generation sources, including wind and solar, on the supply-demand balance in the NEM - with the result that the AEMO letter effectively under-estimated the tightness in the market place.

## LEVELISED COST OF GENERATION

Many commentators compare the levelled cost of intermittent generation with the levelled cost of thermal generation to demonstrate that the LCOG for intermittent generation is now lower than the LCOG for coal-fired generation. But this does not take account of the fact that we are not comparing like with like as the nameplate capacity of these generation sources is not the same as the energy output.

So we now see some people in the energy sector referring to the cost of "firming" wind and solar - so that we can see what is the cost of providing dispatchable energy from these sources and, then, compare it with baseload generation. Unfortunately the presenters of these numbers do not give us their assumptions, or calculations, as to how these "firm" figures were prepared.

A recent case in point is the AGL CFO, which is very instructive. In the AGL CFO's presentation to the Macquarie Australia Conference on 2 May he stated at pages 3-4 of the speaking notes (see attachment and link below):

> "Renewable costs are coming down. Based on our latest analysis, the levelised cost of wind generation is about 65 dollars per megawatt hour and the equivalent cost of solar is about is around 75 dollars. Wind is coming down slowly while solar is coming down rapidly. The issue for renewables is the cost of firming their output which using gas peaking increases the like-for-like cost to about $100 for wind and $125 for solar."

It would be interesting to see what the cost of "firming" wind and solar with batteries would be, but this was not provided. Ie, are these figures realistic - or optimistic?

But the AGL CFO did make the following interesting comments on battery storage (emphasis added):

> "When the sun doesn't shine and the wind doesn't blow you need to move your energy around. So, the answer can only be storage. So, imagine it's the year 2050. AGL has closed Australia's last coal-fired power station, Loy Yang A, in 2048, in line with the Greenhouse Gas Policy we first articulated in 2015. Consistent with that policy, the Liddell and Bayswater power stations have been closed in 2022 and 2035 respectively. And, assuming a rational assessment of cost and carbon efficiency are the drivers, all other coal- fired power will have closed prior to Loy Yang A. So, think about what that world looks like and what we are going to need to do to get there? I will build a scenario using assumptions which are not fixed, but are illustrative. Today, NEM demand is about 170 terawatt hours, which takes about 60 gigawatts of capacity to supply. Let's assume NEM demand is 200 terawatt hours by 2050. It might be higher driven by electric vehicles and general growth. It might be lower driven by energy efficiency and the closure of heavy industry.
>
> Now if you want to supply 200 terawatt hours of renewable energy, you need – again in approximate terms – maybe 90 gigawatts of renewable generation. That compares with roughly 15 gigawatts of installed today, implying a need for 75 gigawatts of new renewable capacity. It's fair to assume some of that will come from rooftop solar, especially if complemented by home batteries. AEMO forecasts another 5 to 10 gigawatts of rooftop solar will be installed by 2035, so let's assume we reach 15 gigawatts rooftop solar by 2050. The point being rooftop space is limited compared with demand, so while rooftop solar will deliver some of what is needed, the majority still looks like coming from grid-scale installations.
>
> ***That's an awful lot of installed capacity: indeed, at today's cost of about 2 million dollars per megawatt, you're talking about 150 billion dollars of new capacity.***
>
> Of course, we expect costs to fall further. But we also need the storage to time shift that generation capacity into the periods of the day when it is required. So, what we're starting to think more and more about is, what does such a world look like.

> How many batteries does it require? One way of estimating this is using the model we just discussed of moving energy. That is, if 65 per cent of renewable energy generated has to be time shifted intra-day to match demand, then ***you roughly need to build 350 gigawatt hours of storage.***
>
> ***In physical terms, with today's technology, if that storage was provided by batteries, this would fill some 350,000 44-foot storage containers, which if laid end to end would stretch from Sydney to Perth with plenty to spare.***
>
> The devil as always is in the detail.
>
> You could argue for more storage needed to cover peak days and multiple days for security. And you could argue for less storage as you start to finesse the matching of demand and supply. But it gives an order of magnitude. We assumed a longer-term storage cost of 300,000 dollars per megawatt hour. This is about a third to a half of today's costs, which feels reasonable given the expected falls to come. ***But it still suggests about 100 billion dollars of storage investment could be needed in the NEM.***
>
> ***So, however you look at it, the investment potential for renewables and storage is colossal.***"

So, picking up on all of this, the AGL CFO is saying that based on some optimistic figures as to energy output from wind and solar and the future cost of storage, a 2050 zero emissions network would require an investment of $250 BILLION.

I think it would be very interesting to calculate the required return on this investment and what this would mean in terms of the cost of a MW of energy in 2050.

It would also be interesting to map where the necessary wind farms, solar farms and battery storage would be located - and then to think about whether the local communities would accept this. Ie, is it really going to be politically acceptable to build all of the intermittent generation AGL is assuming over the next 30 odd years?

An additional point here is that AGL has, in briefings to the media, walked away from the above figures (even though there were made in a release to the ASX and have never been officially changed) - and AGL has done this by referring to the PPA price Origin struck for the sale of the Stockyard Hill wind farm development in Victoria. The price Origin will pay is $55/MWH, but this is an artificial price, as the other part of the negotiation was the price it received for the sale of the wind farm development; i.e., there was a trade off between the price to be paid for the energy output and the price received for the sale of the property and development approval, so it can be reasonably argued that the $55 figure is an artificial price.

**LEVELISED COST OF INTERMITTENT GENERATION VERSUS BROWNFIELD COAL AND THE COST OF CONNECTING TO THE G**RID

The advocates of intermittent generation compare the cost of that generation with the cost of new coal; i.e., they focus on the cost of a Greenfield coal-fired generator.

But what they do not raise, especially in the context of Liddell, is the cost of "firm" wind and solar versus the cost of upgrading an existing coal-fired generator and/or the cost of a HELE plant at an existing site with existing infrastructure.

This last point also highlights the fact that the Levelled Cost of Generation looks as the cost of generation from the generator's perspective, but I would submit that Governments need to look at the cost of delivering energy to end customers and, therefore, must take into account the additional costs of connecting to the grid for the various generation sources.

Coal fired generators are large sources of energy at a centralised point, whereas intermittent generators are spread out over a wide geographical area and, over time as the best sites are used, will be further and further away from major population centres. Thus the cost of connecting a 1,500MW nameplate capacity coal fired generator to the grid will be far less than connecting a combined 1,500MWs of geographically dispersed intermittent generation to the grid - and imagine the additional costs if this intermittent generation actually matched the energy output of this 1,500MW nameplate capacity coal fired generator (which theoretically would mean a nameplate capacity of over 4,500MW).

An additional point not raised in the AGL CFO's comments on the cost of getting to a zero emissions position in 2050 is the potentially greater need for interconnections to connect the differing generating sources in the different States in order to maximise the integration of these dispersed energy sources; e.g., the Southern States are more favourable for wind generation, whereas Queensland is more favourable for solar.

I would note here that the general rule of thumb in the energy sector is that you add on an additional 10% of the cost of new generation to take account of the cost of connecting that new generation to the grid. Thus the corresponding figures from the AGL CFO for "firm" wind and solar with the additional costs of connecting to the grid would be: $110 for wind and $137.50 for solar.

Analysis by Delta Electricity - s45 - demonstrates that the most cost effective way of supplying continuous dispatchable energy is through upgrading existing coal fired plants through improvements of efficiency, etc and construction of new coal fired plants on existing sites, which then allows access to the existing infrastructure and, more than likely, significantly reduces the timeline for planning approvals.

The cost of a 1,000MW HELE plant at an existing site would be around $2.2 Billion.

When you add up all of the components of AGL's Liddell replacement scenario (which was spelt out at AGL's Full Year Profit Results announcement last month), the capital outlay is in excess of $2 Billion, and this is before accounting for the necessary "firming" capacity from gas peakers and/or battery storage and does not take into account the additional costs that would be borne by consumers for connecting this new intermittent generation, etc to the grid.

s 47G(1)(a) +(b)

[redacted]

Best regards,

John Short

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