Attachment A: Potential DSM benefits– Victoria/South Australia Interconnection Upgrade

This attachment describes the maximum benefits per megawatt (to the best knowledge of ElectraNet and AEMO) for capital deferral (i.e., deferral of peak generation investment), fixed generator operating and maintenance costs, and competition benefits. The attachment also provides information to help assess the required technical qualities of an appropriate demand side management (DSM) option.

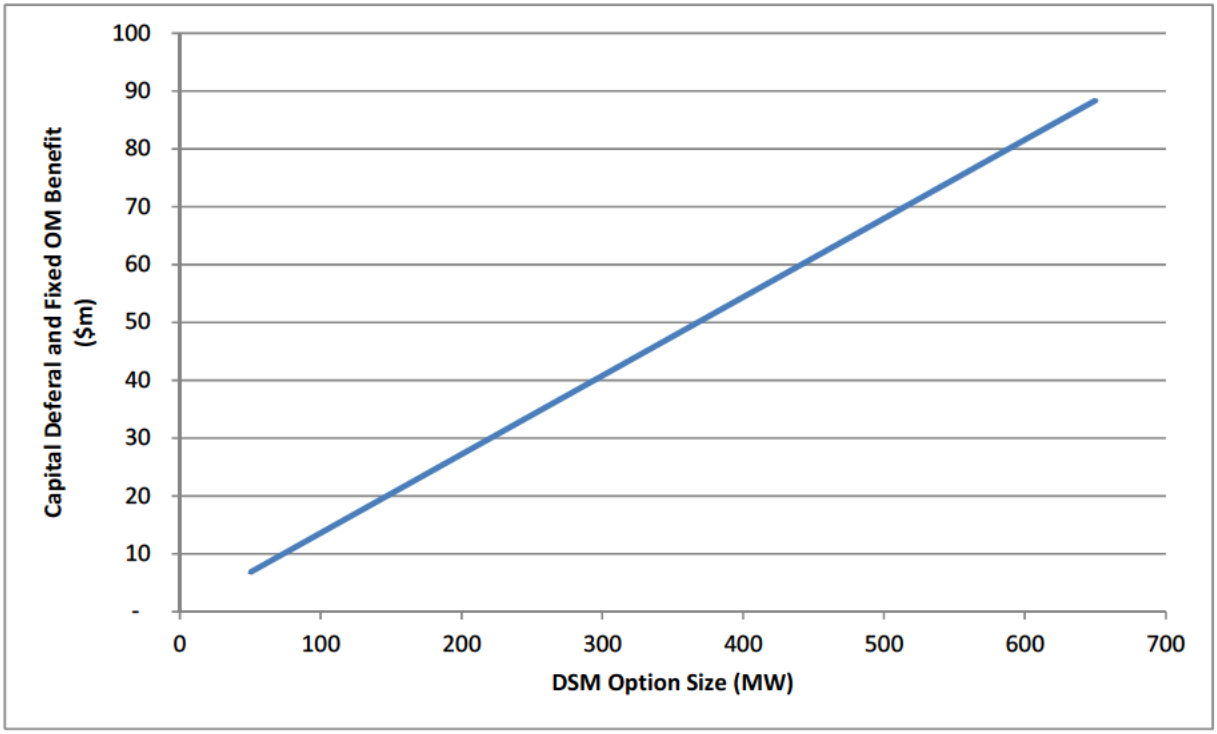
Capital deferral and fixed operating and maintenance cost benefits

It is difficult to assess the optimal size of DSM required to meet the identified need in South Australia without information on the cost structure of various DSM solutions. Consequently, AEMO and ElectraNet have estimated a set of gross market benefits, assuming various levels of DSM would displace new gas-fired peaking capacity of an equivalent size. The table below provides the assumed size of new peaking capacity that may be built in South Australia by 2017/18 in the absence of DSM or any network augmentation.

Year	13/14	14/15	15/16	16/17	17/18
Maximum Capital Deferral (MW)	397	471	471	526	635

The maximum annualised capital cost and fixed operating and maintenance cost savings associated with deferring new generation investment in gas-fired peaking capacity are presented in the chart below. These are based on an annualised cost of approximately $136,000 per MW of deferred OCGT. By comparing these annual average benefits against the costs of obtaining various levels of DSM, it is envisaged that a DSM solution could be proposed that may potentially delay the need for network augmentation.

The costs associated with any DSM option have not been included on this graph.



The calculated benefits assume that the full DSM capacity will be available at the South Australian regional reference node, and that it will be dispatched at times consistent with the dispatch of a typical OCGT.

Competition Benefits

To deliver maximum competition benefits there would need to be 700 MW of DSM in 2015. This was calculated using a forecast of the supply and demand balance in the year 2015 to identify the pivotal supplier and the demand threshold at which they become pivotal. There are two issues of note with this value. Firstly, a smaller size will still deliver competition benefits and should still be considered. Secondly, the significant size of the DSM option reflects the likelihood that the DSM option will itself defer other investment in the market that may also create competition benefits.

DSM for competition benefits will not need to be permanent as the competitive environment will change over time reducing the benefits available to DSM.

Additional Information regarding DSM technical characteristics

The tables below estimate the average frequency and duration of DSM dispatch periods assuming that the DSM would effectively act to shave the peak off the projected South Australian ten per cent Probability of Exceedence load duration curve. Results are presented only up to the maximum sizes identified in the table on page 2.

DSM size (MW)	13/14	14/15	15/16	16/17	17/18
Expected hours dispatched					
50	5	5	5	5	5
100	9	9	9	9	9
150	20	15	15	14	14
200	34	30	29	27	27
250	43	39	39	38	37
300	56	58	58	54	49
350	73	72	69	68	63
400	85	86	83	78	72
450		101	97	94	88
500				103	96
550					112
600					131

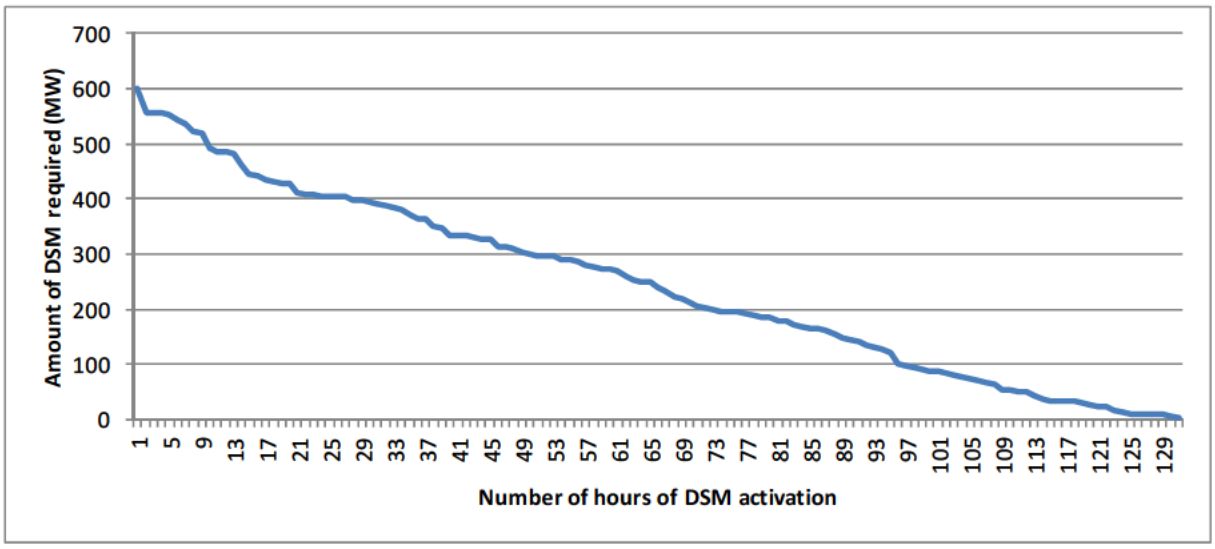
DSM size (MW)	13/14	14/15	15/16	16/17	17/18
Number of distinct activations					
50	3	3	3	3	3
100	4	4	4	4	4
150	6	4	4	3	3
200	8	8	8	7	7
250	9	10	10	10	10
300	11	12	12	12	10
350	14	14	13	13	12
400	16	14	13	13	12
450		15	15	15	14
500				17	15
550					16
600					18

DSM size (MW)	13/14	14/15	15/16	16/17	17/18
Maximum duration of dispatch period (hrs)					
50	2	2	2	2	2
100	4	4	4	4	4
150	8	8	8	8	8
200	10	10	10	10	10
250	10	10	10	10	10
300	11	11	11	11	11
350	11	11	11	11	11
400	12	12	12	12	12
450		12	12	12	12
500				12	12
550					12
600					13

For clarity it should be emphasised that, in the tables above, the full amount of available DSM would not be required in every hour that the DSM is activated. For example, if 600 MW

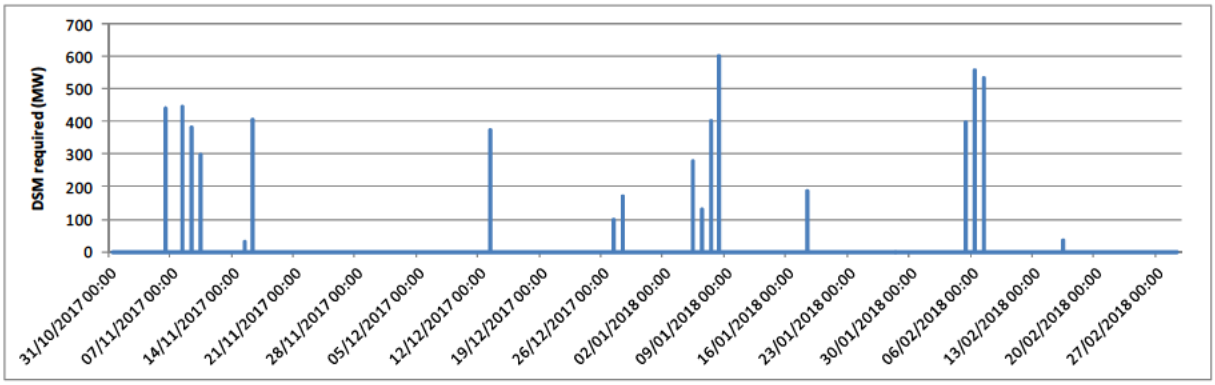
of DSM were to be available in 2017/18, the tables have been constructed assuming that the DSM would be activated whenever demand lies within 600 MW of the forecast peak demand.

This top triangle of the load duration curve for 2017/18 is shown in the Figure below.



While the DSM would be activated approximately 130 hours, the full 600 MW would be required for less than 5 hours. For 19 hours, the total amount of DSM required would be less than 50 MW.

The size, frequency and timing of DSM activation in 2017/18 are shown in the Figure below. In this scenario, all activations occur between November and February.



DSM that delivers a capital deferral benefit should not require rapid response times. Demand peaks can normally be seen coming in advance with the weather forecasts. Day-ahead notice can be expected to deliver the bulk of the capital deferral market benefits. However, the required dispatch period (time and length) can change on short notice during the day due to changing weather patterns and / or load behaviour.

This form of DSM will only be required during peak periods. Heat waves can hit South Australia during late November to late March, if it is cheaper to provide this response over a shorter window, the bulk of benefits can be captured between December and early March.

DSM that delivers the maximum competition benefits should be able to deliver the full benefit on a five minute basis to unexpected network or generator events. However, these events are not persistent and the market benefits of such a rapid response are unlikely to be large.

DSM is a known and credible option to managing peak demand conditions in most circumstances. ElectraNet and AEMO understand that wind-following technology is currently undergoing trials in international markets. Should such an option be proposed, AEMO and ElectraNet would also like accompanying proof of technical feasibility and/or real-world examples.

Details to enable DSM modelling

- quantity and type of DSM (MW provided, and whether it is load reduction or load shifting), noting the maximum capital deferral sizes in the table on page 2, and that a maximum size of 700 MW is believed to deliver the maximum competition benefit.
- total number of hours that the MW reduction could be called on in a year.
- total consecutive hours for any one instance.
- proof of technical feasibility of the option proposed.
- total cost of the DSM option.
- any operating restrictions.