AEMO EAAP REPORT UPDATE MARCH 2011

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APPROVED BY:	Mark Miller – Executive General Manager System Operations
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Contents

1 INTRODUCTION

AEMO is required by the National Electricity Rule 3.7C(d) to publish an *EAAP*[1] on a quarterly basis. The National Electricity Rule 3.7C(n) requires *AEMO* to comply with *EAAP guidelines*[2] in preparing *EAAP*.

The *EAAP*[3] replaced the quarterly AEMO Drought Scenarios Investigation Report, with the final Drought Report having been published in December 2009. The first *EAAP* was published on 31 March 2010.

EAAP uses probabilistic modelling to determine the regional *Unserved Energy* (*USE*) at an hourly resolution during the 24 month Study Period. This involves the use of time-sequential, security constrained optimal dispatch simulations, incorporating Monte-Carlo Simulations.

The annual percentage of *USE* per region is the key indicator of energy adequacy in the *NEM*.

1.1 March 2011 *EAAP* Report

The study period[4] for this *EAAP* report is from 1 April 2011 to 31 March 2013.

The closing date for submitting Variable GELF Parameters by Scheduled Generators was 7 February 2011.

For the purpose of this report 'Year 1' is defined as 1 April 2011 to 31 March 2012, and 'Year 2' is defined as 1 April 2012 to 31 March 2013.

This *EAAP* report is based on the following three Rainfall Scenarios:

Scenario 1: Low rainfall – based on rainfall between 1 July 2006 and 30 June 2007 for all Regions except New South Wales. For New South Wales the low rainfall scenario is based on the rainfall experienced between 1 June 2006 and 31 May 2007[5].

Scenario 2: Short term average rainfall – based on the average rainfall recorded over the past 10 years.

Scenario 3: Long term average rainfall – based on the average rainfall recorded over the past 50 years, or the longest period for which rainfall data is available should this be less than 50 years.

[1] Energy Adequacy Assessment Projection (EAAP) – Glossary of the Electricity Market Rules defines the EAAP as 'A projection of AEMO's assessment of energy availability that accounts for energy constraints for each month over a 24 month period, which is prepared and published in accordance with rule 3.7C and is measured as *unserved energy* for each region.'

[2] The *EAAP guidelines* have been determined following Electricity Rule Consultation Procedures and can be accessed using the following web link:

http://www.aemo.com.au/electricityops/408-0001.html

[3] Previous AEMO EAAP are available at the following location on *AEMO* website:

http://www.aemo.com.au/electricityops/eaap.html

[4] A study period refers to a specified time period for which the Energy Adequacy Assessment Projections are conducted.

[5] Had this change not been made for New South Wales, the low rainfall scenario would have had more rainfall than the short term average rainfall scenario in the catchment areas.

1.2 *EAAP* inputs and outputs

The closing date for GELF submissions was extended past the required timeframe specified in *EAAP guidelines* due to participant request. The scheduled generating units submitted their Variable GELF Parameters[6] by the extended deadline. These include all the scheduled generating units that had provided their generation constraints under various rainfall scenarios for the December 2010 *EAAP*.

The demand profiles used in March 2011 EAAP are consistent with the energy and demand projections that have been published in 2010 Electricity Statement of Opportunities (ESOO). Estimates of demand side participation published as "Very likely" in the 2010 ESOO have also been used as an input in March 2011 *EAAP*.

The *EAAP guidelines* require *AEMO* to publish the following *EAAP* reports:

1. *EAAP* Public Report – This report will include the following items for each of the Scenarios on regional basis:
    - Monthly *USE* for the study period in GWh
    - *USE* for the first 12 months and for the second 12 months in the study period in GWh
    - Monthly energy generation for the study period in GWh on a *NEM*-wide basis
2. Private *EAAP* reports for each Generator who owns scheduled generating units or hydro power schemes that have been included in each of the Scenarios:
    - Monthly energy generation reductions in GWh for the scheduled generating unit or hydro power scheme for the study period
    - Monthly capacity reductions in MW for the scheduled generating unit or hydro power scheme for the study period
    - Monthly generation contribution in GWh from the scheduled generating unit or hydro power scheme for the study period
    - Monthly generation contribution in GWh for the first 12 months and for the second 12 months in the study period.

This *AEMO EAAP* Report Update March 2011 covers the requirement to publish the *EAAP* Public Report (i.e. first report stated above).

1.3 Interpretation of *USE* forecasts determined by *EAAP* studies

The electricity supply estimates in this *EAAP* Report are based on the Variable GELF parameters submitted by *NEM* Scheduled Generators as required by the *EAAP guidelines*, during January and February 2011, so the results should be regarded as reflecting an input 'snapshot' taken at that time.

The water-related energy limitations submitted by Scheduled Generators are based on the known share of water available for generation at the time, as advised by jurisdictions and water authorities.

2 RESULTS SUMMARY

The following tables summarise the annual *unserved energy* (*USE*) figures for each region, and provide comparisons between the *EAAP* published in December 2010 and the March 2011 *EAAP*

[6] Generator Energy Limitation Framework (GELF) – Glossary of the Electricity Market Rules defines the GELF as "A description of the energy constraints that affect the ability of scheduled generating unit to generate electricity prepared in accordance with the EAAP guidelines."

report. The grey shading highlights where the annual *USE* is higher than the Reliability Panel standard of 0.002%[7].

The March 2011 EAAP results forecast small increases in *USE* for Queensland and small decreases for New South Wales, Victoria and South Australia for Year 1 of the low rainfall scenario. The marginal levels of *USE* forecast for these four regions are below the Reliability Panel Standard of 0.002%. There was no noticeable forecast *USE* for Tasmania in the December 2010 and March 2011 *EAAP* studies for Year 1 of the low rainfall scenario.

The March 2011 EAAP forecasts a significant increase in *USE* for Queensland as well as some increases in *USE* for New South Wales, South Australia and Victoria for the Year 2 of the low rainfall scenario, compared to December 2010 *EAAP*. The forecast *USE* is marginally above the Reliability Panel Standard of 0.002% for Queensland and South Australia regions and significantly above the standard for Victoria for the Year 2 in this scenario. The forecast *USE* is below the Reliability Panel Standard of 0.002% for New South Wales and Tasmania for this period.

The forecast Queensland *USE* is 0.0022% for each of the three rainfall scenarios for the Year 2. This indicates the forecast Queensland *USE* is not correlated to the energy constraints caused by the availability of water. This increase in *USE* can instead be attributed to the regional demand profile used for Queensland for the Year 2, which has been prepared with a growth of approximately 4.75% consistent with the Queensland summer maximum demand projections published in ESOO 2010 under the medium growth scenario.

The forecast *USE* is higher than the Reliability Panel Standard in the Year 2 of the low rainfall scenario for Victoria and South Australia due to energy restrictions on a power station in Victoria.

Forecast *USE* in all regions is below 0.002% except for Queensland for both years of the short term and long term average rainfall scenarios.

TABLE 1: *UNSERVED ENERGY* FOR SCENARIO 1 - LOW RAINFALL

Low rainfall		NSW	QLD	SA	TAS	VIC
Year 1	December 2010 Update	0.0002%	0.0001%	0.0004%	0.0000%	0.0004%
	March 2011 Update	0.0000%	0.0002%	0.0002%	0.0000%	0.0002%
Year 2	December 2010 Update	0.0002%	0.0005%	**0.0021%**	0.0001%	**0.0058%**
	March 2011 Update	0.0004%	**0.0022%**	**0.0024%**	0.0000%	**0.0083%**

[7] The Reliability Panel establish the standard for supply reliability in the *NEM*, which is 0.002% *unserved energy* in each region. This standard requires that no more than 0.002% of each region's energy demand should be unserved due to supply shortfalls. Note that this does not include customer interruptions due to failures in transmission and distribution networks.

TABLE 2: *UNSERVED ENERGY* FOR SCENARIO 2 - SHORT TERM AVERAGE RAINFALL

Short term average rainfall		NSW	QLD	SA	TAS	VIC
Year 1	December 2010 Update	0.0001%	0.0001%	0.0004%	0.0000%	0.0004%
	March 2011 Update	0.0000%	0.0002%	0.0002%	0.0000%	0.0001%
Year 2	December 2010 Update	0.0000%	0.0004%	0.0000%	0.0000%	0.0001%
	March 2011 Update	0.0004%	**0.0022%**	0.0003%	0.0000%	0.0004%

TABLE 3: *UNSERVED ENERGY* FOR SCENARIO 3 - LONG TERM AVERAGE RAINFALL

Long term average rainfall		NSW	QLD	SA	TAS	VIC
Year 1	December 2010 Update	0.0001%	0.0001%	0.0004%	0.0000%	0.0004%
	March 2011 Update	0.0000%	0.0002%	0.0002%	0.0000%	0.0001%
Year 2	December 2010 Update	0.0002%	0.0005%	0.0000%	0.0000%	0.0002%
	March 2011 Update	0.0006%	**0.0022%**	0.0003%	0.0000%	0.0004%

3 NEW GENERATION AND GENERATION RETIREMENTS

3.1 New Generator Projects

Based on the information published on the Generation Information Page[8], as well as on the subsequent updates received, the following committed significant generator projects have been included in the model:

[8] The Generation Information Page is available on *AEMO* website at: http://www.aemo.com.au/data/gendata.shtml

TABLE 4: NEW GENERATORS

Station	State	Capacity	When
Mortlake Stage 1	VIC	553 MW (winter) 518 MW (summer)	Winter 2011
Oaklands wind farm	VIC	67 MW	Winter 2011
Hallett 5 (The Bluff) wind farm	SA	53 MW	Summer 2011/12
Woodlawn wind farm	NSW	42 MW	Winter 2011
Gunning wind farm	NSW	46.5 MW	Winter 2011

3.2 Retired Generation

Based on the information published on the Generation Information Page, as well as the subsequent updates received, there were no retirements of Scheduled Generating Units modelled in March 2011 *EAAP* report.

Swanbank B2 and B4 units in Queensland region were assumed unavailable since these generating units would be in long term storage during the study period.

Munmorah No.3 and 4 units in New South Wales were assumed to be out of service with a recall time longer than 24 hours.

4 DETAILED RESULTS

The *EAAP* simulation studies provide forecasts of customer load that might not be able to be met during the study period. As the studies are probabilistic in nature, 400 simulation studies were performed for each rainfall scenario using both 10% Probability of Exceedence (POE) and 50% POE demand forecasts. The results of all of these simulation studies have been 'averaged' as explained in the section 5.2 of the *EAAP guidelines*[9], using the following weightings:

Weighted result = 0.696 x 50% POE result + 0.304 x 10% POE result.

The above weighting is similar to the weightings used in studies for the 2010 National Transmission Network Development Plan[10], and provides a balance by giving higher weighting to the more expected 50% POE results, whilst still capturing the influence of the more pessimistic 10% POE results.

The figures in the following tables represent the average monthly regional energy demand that was not able to be met in gigawatt hours (GWh).

The *EAAP* modelling is probabilistic in nature because it is not possible to be certain about future customer demand or generator failures, etc. As a result, the forecast *unserved energy* figures presented in the following tables should not be interpreted as certainty of blackouts, but rather as an estimate of what could occur. If customer demand is moderate to low, or generator failures do not occur at critical times, then the *unserved energy* estimates contained in this update are unlikely to eventuate.

Shaded cells indicate where *USE* exceeds the Reliability Panel Standard of 0.002% in a region.

[9] The *EAAP guidelines* are available at the following location on AEMO website:
http://www.aemo.com.au/electricityops/408-0001.html

[10] The 2010 National Transmission Network Development Plan is available at the following location on AEMO website:
http://www.aemo.com.au/planning/ntndp.html

4.1 Scenario 1: Low Rainfall - Forecast *Unserved Energy* (GWh)

TABLE 5: FORECAST *USE* IN SCENARIO 1 – LOW RAINFALL

	NSW	QLD	SA	TAS	VIC
Apr-11	0.000	0.000	0.000	0.000	0.000
May-11	0.000	0.000	0.000	0.000	0.000
Jun-11	0.000	0.000	0.000	0.000	0.000
Jul-11	0.000	0.000	0.000	0.000	0.000
Aug-11	0.002	0.000	0.000	0.000	0.000
Sep-11	0.000	0.000	0.000	0.000	0.000
Oct-11	0.000	0.000	0.000	0.000	0.000
Nov-11	0.000	0.000	0.000	0.000	0.000
Dec-11	0.000	0.005	0.000	0.000	0.000
Jan-12	0.003	0.020	0.000	0.000	0.005
Feb-12	0.005	0.063	0.000	0.000	0.006
Mar-12	0.000	0.052	0.024	0.000	0.075
Total GWh	0.009	0.140	0.025	0.000	0.086
Region %	0.0000%	0.0002%	0.0002%	0.0000%	0.0002%
Apr-12	0.000	0.000	0.000	0.000	0.000
May-12	0.000	0.000	0.000	0.000	0.000
Jun-12	0.000	0.000	0.000	0.000	0.000
Jul-12	0.000	0.002	0.000	0.000	0.000
Aug-12	0.000	0.001	0.000	0.000	0.000
Sep-12	0.000	0.000	0.000	0.000	0.000
Oct-12	0.000	0.000	0.000	0.000	0.000
Nov-12	0.000	0.008	0.000	0.000	0.000
Dec-12	0.001	0.068	0.000	0.000	0.006
Jan-13	0.002	0.506	0.031	0.000	0.654
Feb-13	0.345	0.583	0.015	0.000	2.563
Mar-13	0.003	0.160	0.286	0.000	1.132
Total GWh	0.351	1.327	0.332	0.000	4.356
Region %	0.0004%	**0.0022%**	**0.0024%**	**0.0000%**	**0.0083%**

4.2 Scenario 2: Short Term Average Rainfall - Forecast *Unserved Energy* (GWh)

TABLE 6: FORECAST *USE* IN SCENARIO 2 – SHORT TERM AVERAGE RAINFALL

	NSW	QLD	SA	TAS	VIC
Apr-11	0.000	0.000	0.000	0.000	0.000
May-11	0.000	0.000	0.000	0.000	0.000
Jun-11	0.000	0.000	0.000	0.000	0.000
Jul-11	0.000	0.000	0.000	0.000	0.000
Aug-11	0.002	0.000	0.000	0.000	0.000
Sep-11	0.000	0.000	0.000	0.000	0.000
Oct-11	0.000	0.000	0.000	0.000	0.000
Nov-11	0.000	0.000	0.000	0.000	0.000
Dec-11	0.000	0.005	0.000	0.000	0.000
Jan-12	0.004	0.021	0.000	0.000	0.005
Feb-12	0.004	0.063	0.000	0.000	0.004
Mar-12	0.000	0.052	0.021	0.000	0.066
Total GWh	0.010	0.141	0.022	0.000	0.075
Region %	0.0000%	0.0002%	0.0002%	0.0000%	0.0001%
Apr-12	0.000	0.000	0.000	0.000	0.000
May-12	0.000	0.000	0.000	0.000	0.000
Jun-12	0.000	0.000	0.000	0.000	0.000
Jul-12	0.000	0.002	0.000	0.000	0.000
Aug-12	0.000	0.001	0.000	0.000	0.000
Sep-12	0.000	0.000	0.000	0.000	0.000
Oct-12	0.000	0.000	0.000	0.000	0.000
Nov-12	0.000	0.008	0.000	0.000	0.000
Dec-12	0.001	0.068	0.000	0.000	0.000
Jan-13	0.003	0.503	0.001	0.000	0.006
Feb-13	0.303	0.584	0.001	0.000	0.079
Mar-13	0.003	0.159	0.040	0.000	0.107
Total GWh	0.309	1.325	0.042	0.000	0.192
Region %	0.0004%	**0.0022%**	0.0003%	0.0000%	0.0004%

4.3 Scenario 3: Long Term Average Rainfall - Forecast *Unserved Energy* (GWh)

TABLE 7: FORECAST *USE* IN SCENARIO 3 – LONG TERM AVERAGE RAINFALL

	NSW	QLD	SA	TAS	VIC
Apr-11	0.000	0.000	0.000	0.000	0.000
May-11	0.000	0.000	0.000	0.000	0.000
Jun-11	0.000	0.000	0.000	0.000	0.000
Jul-11	0.000	0.000	0.000	0.000	0.000
Aug-11	0.004	0.000	0.000	0.000	0.000
Sep-11	0.000	0.000	0.000	0.000	0.000
Oct-11	0.000	0.000	0.000	0.000	0.000
Nov-11	0.000	0.000	0.000	0.000	0.000
Dec-11	0.000	0.005	0.000	0.000	0.000
Jan-12	0.003	0.020	0.000	0.000	0.003
Feb-12	0.004	0.063	0.000	0.000	0.005
Mar-12	0.000	0.052	0.020	0.000	0.062
Total GWh	0.012	0.140	0.020	0.000	0.070
Region %	0.0000%	0.0002%	0.0002%	0.0000%	0.0001%
Apr-12	0.000	0.000	0.000	0.000	0.000
May-12	0.000	0.000	0.000	0.000	0.000
Jun-12	0.000	0.000	0.000	0.000	0.000
Jul-12	0.000	0.002	0.000	0.000	0.000
Aug-12	0.000	0.001	0.000	0.000	0.000
Sep-12	0.000	0.000	0.000	0.000	0.000
Oct-12	0.000	0.000	0.000	0.000	0.000
Nov-12	0.000	0.008	0.000	0.000	0.000
Dec-12	0.001	0.067	0.000	0.000	0.000
Jan-13	0.001	0.502	0.001	0.000	0.011
Feb-13	0.456	0.581	0.001	0.000	0.097
Mar-13	0.005	0.159	0.039	0.000	0.106
Total GWh	0.463	1.320	0.042	0.000	0.214
Region %	0.0006%	**0.0022%**	0.0003%	0.0000%	0.0004%

4.4 FORECAST MONTHLY ENERGY GENERATION ON *NEM*-WIDE BASIS

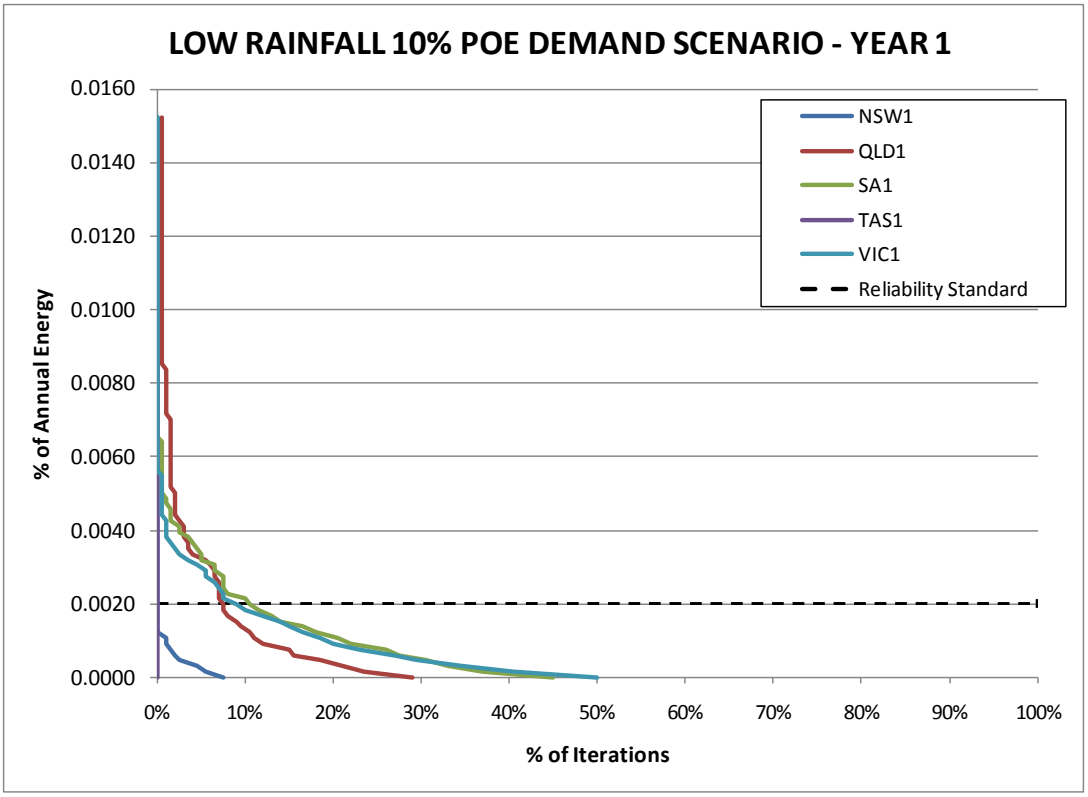
TABLE 8: FORECAST MONTHLY ENERGY GENERATION ON *NEM*-WIDE BASIS

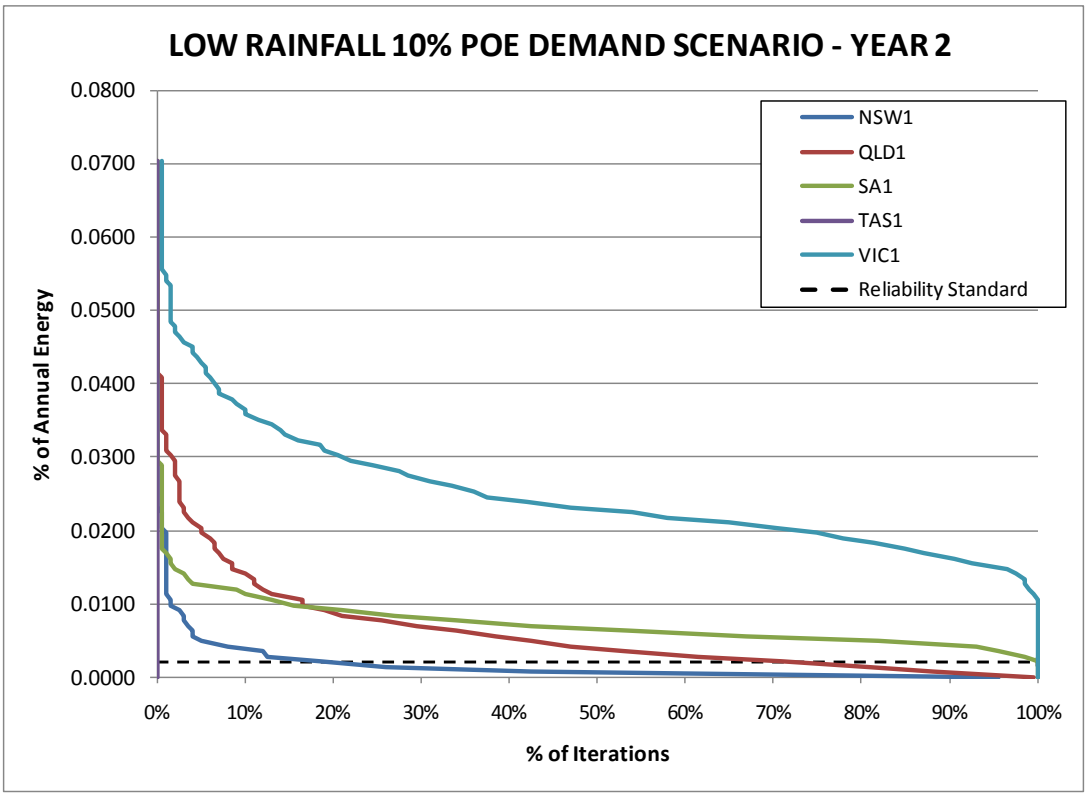
	Low Rainfall	Short-Term Average Rainfall	Long-Term Average Rainfall
Apr-11	16541.234	16524.145	16561.732
May-11	18336.047	18329.291	18362.670
Jun-11	18007.178	18007.674	18002.814
Jul-11	19171.650	19169.027	19176.135
Aug-11	18769.730	18778.131	18779.506
Sep-11	17288.395	17274.400	17268.941
Oct-11	17343.264	17337.074	17369.133
Nov-11	17502.467	17521.234	17521.895
Dec-11	18159.381	18148.086	18162.639
Jan-12	19260.852	19252.887	19283.074
Feb-12	18089.586	18125.996	18156.393
Mar-12	18721.230	18734.625	18714.412
Total GWh	217191.016	217202.578	217359.344
Apr-12	16963.389	16936.957	16958.348
May-12	18720.770	18724.701	18707.760
Jun-12	18438.258	18463.012	18443.066
Jul-12	19691.428	19693.467	19690.766
Aug-12	19248.500	19264.072	19247.695
Sep-12	17533.715	17568.250	17542.762
Oct-12	17922.732	17922.953	17918.695
Nov-12	17901.994	17917.146	17919.031
Dec-12	18598.918	18604.223	18584.182
Jan-13	19804.607	19821.996	19816.461
Feb-13	17909.486	17890.637	17892.377
Mar-13	19253.057	19245.029	19253.738
Total GWh	221986.859	222052.438	221974.875

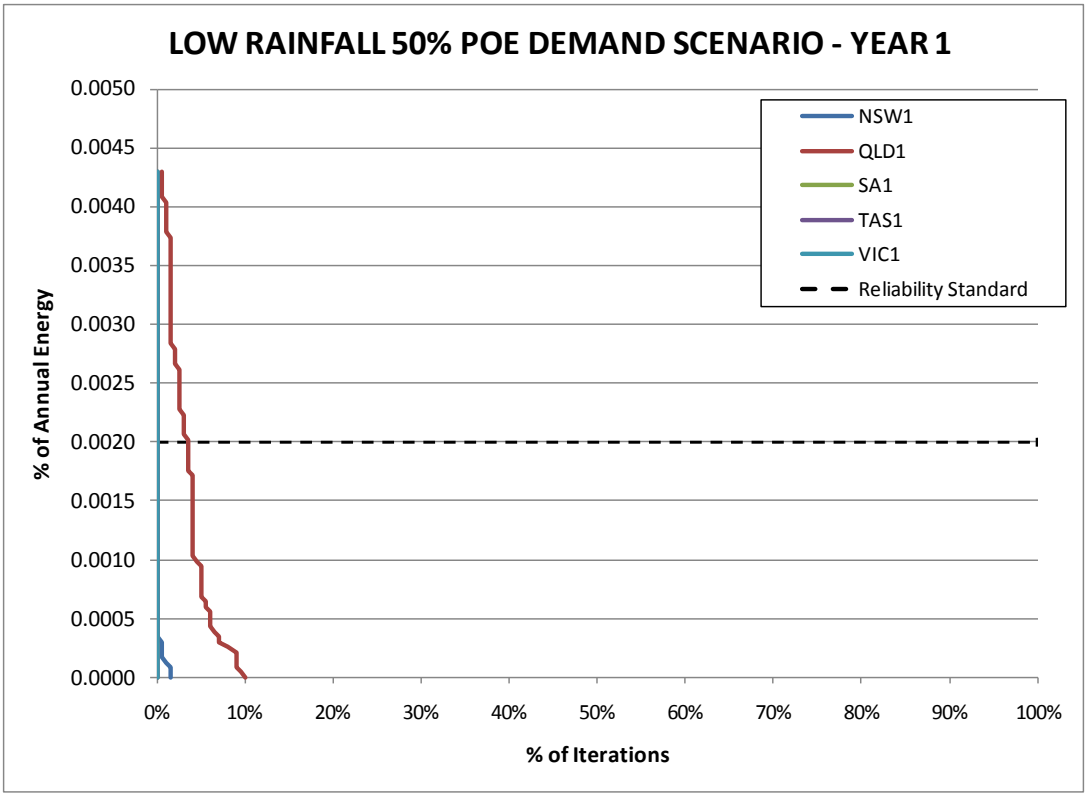
4.5 *USE* Distributions

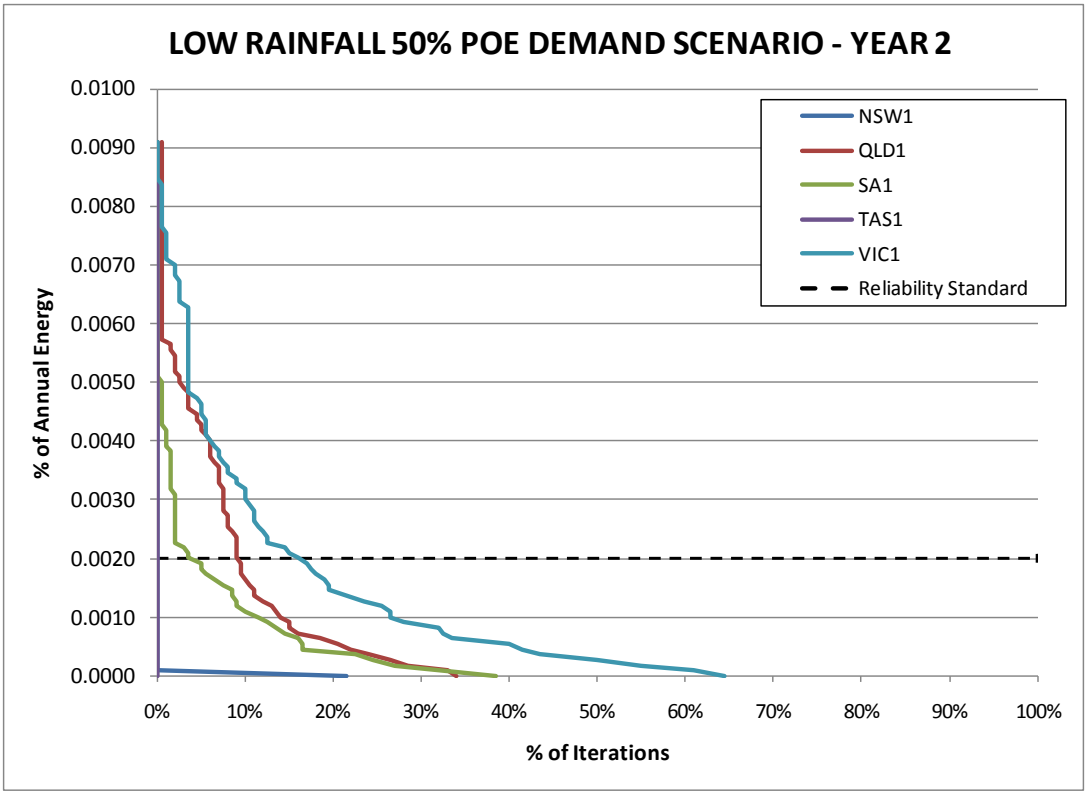
The *USE* distribution graphs are used to show how many *EAAP* simulation studies (Monte Carlo iterations) exceeded a given *USE* level. The *USE* values are expressed as a percentage of regional energy. This is to allow easier reference to the Reliability Panel standard of 0.002% *USE*.

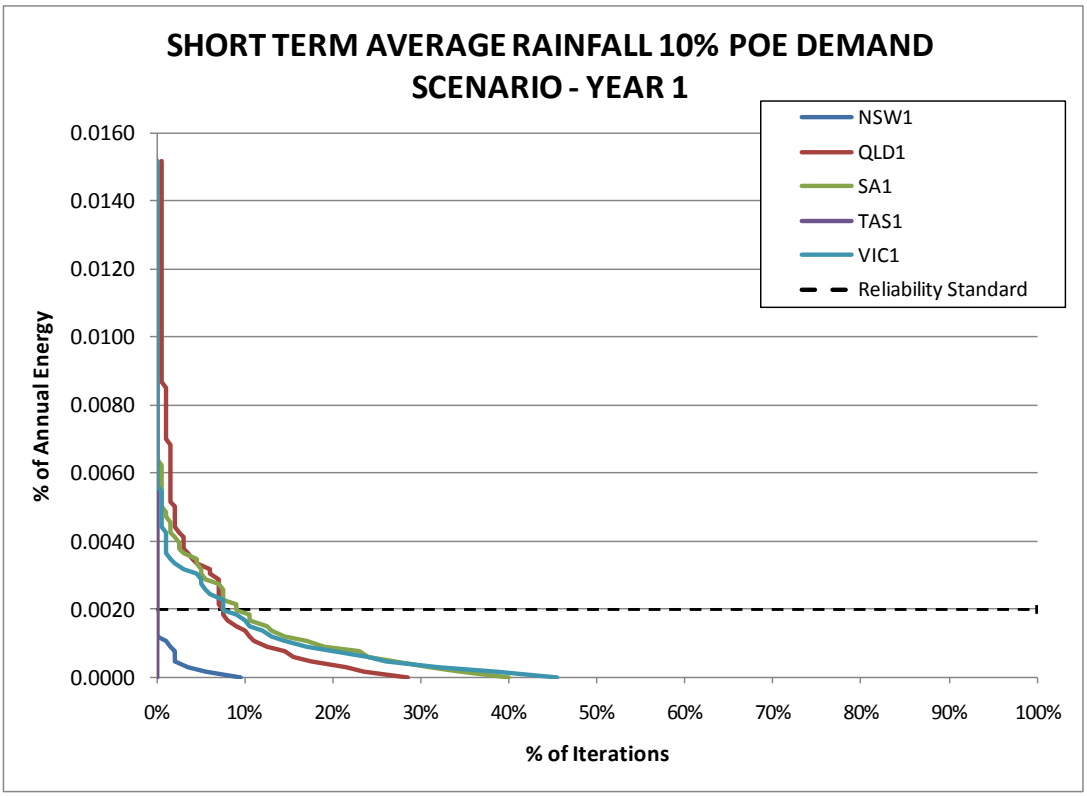
Separate graphs are presented for the 10% and 50% POE simulations.

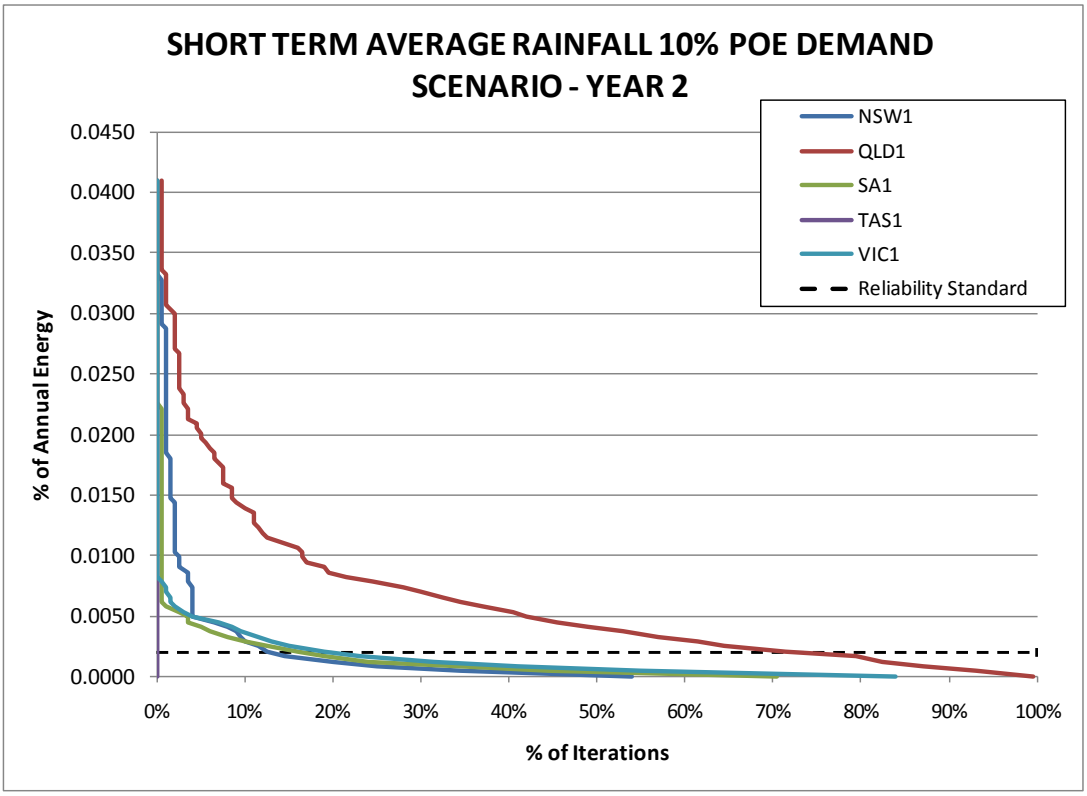

LOW RAINFALL 10% POE DEMAND SCENARIO - YEAR 1
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard

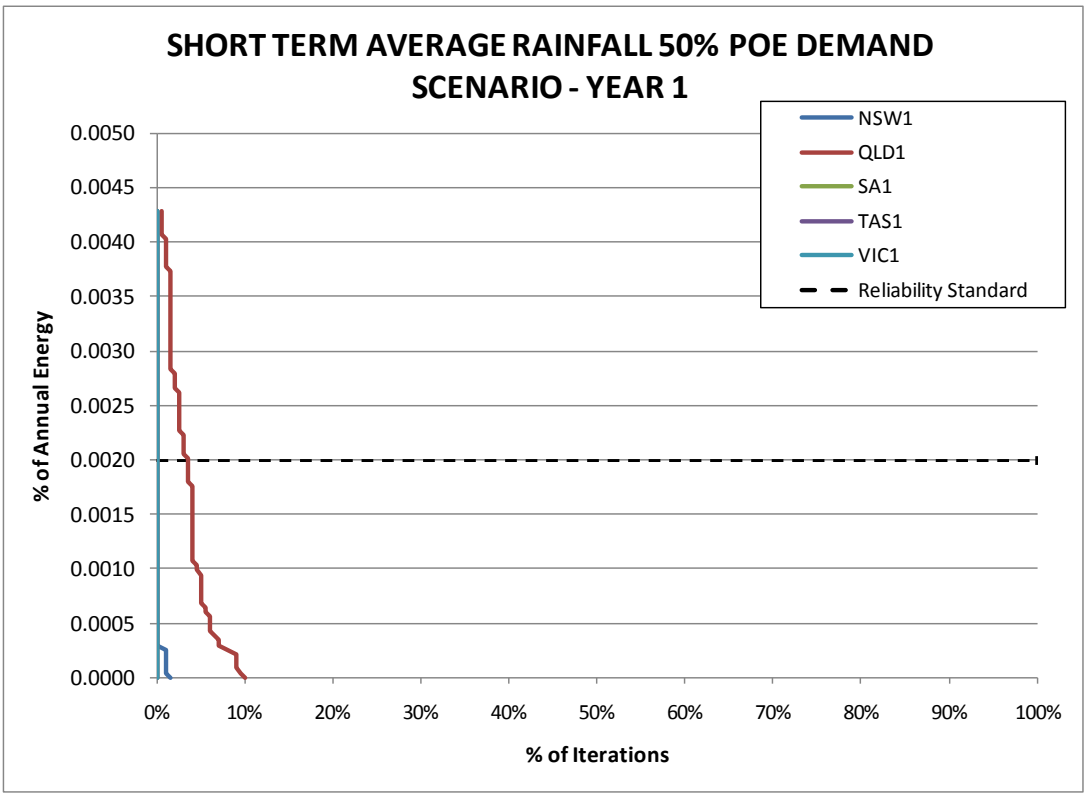

LOW RAINFALL 10% POE DEMAND SCENARIO - YEAR 2
0.0800
0.0700
0.0600
0.0500
0.0400
0.0300
0.0200
0.0100
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard

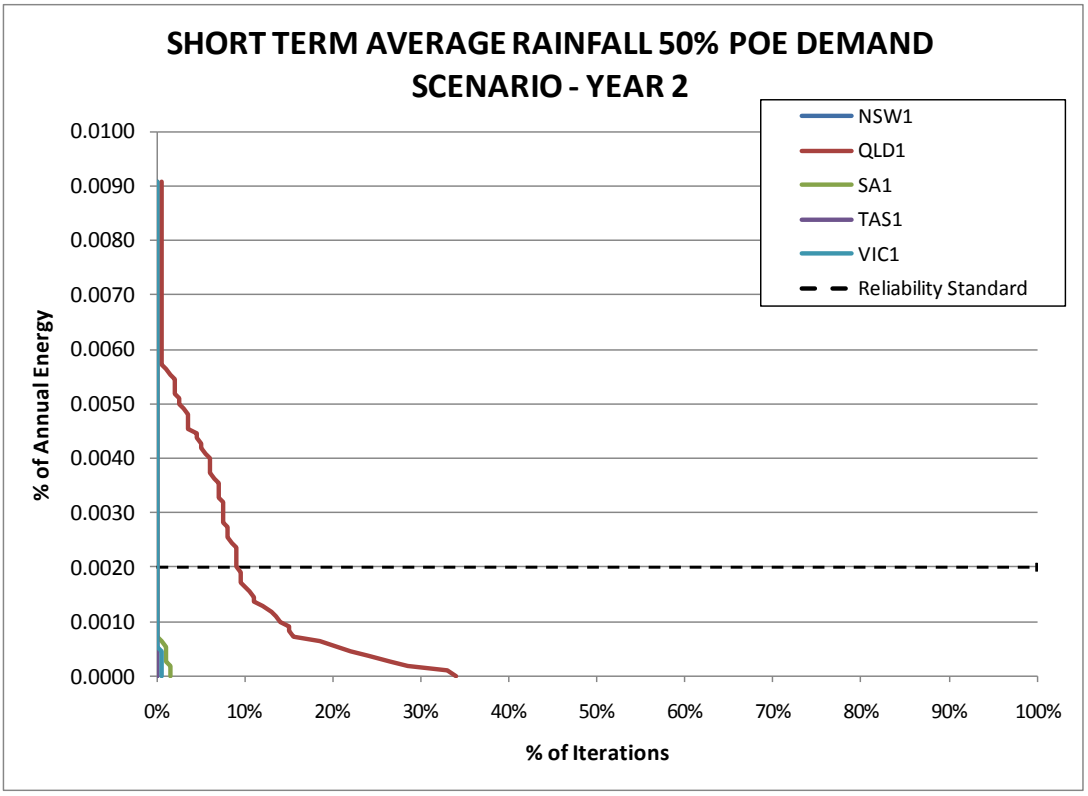

LOW RAINFALL 50% POE DEMAND SCENARIO - YEAR 1
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard

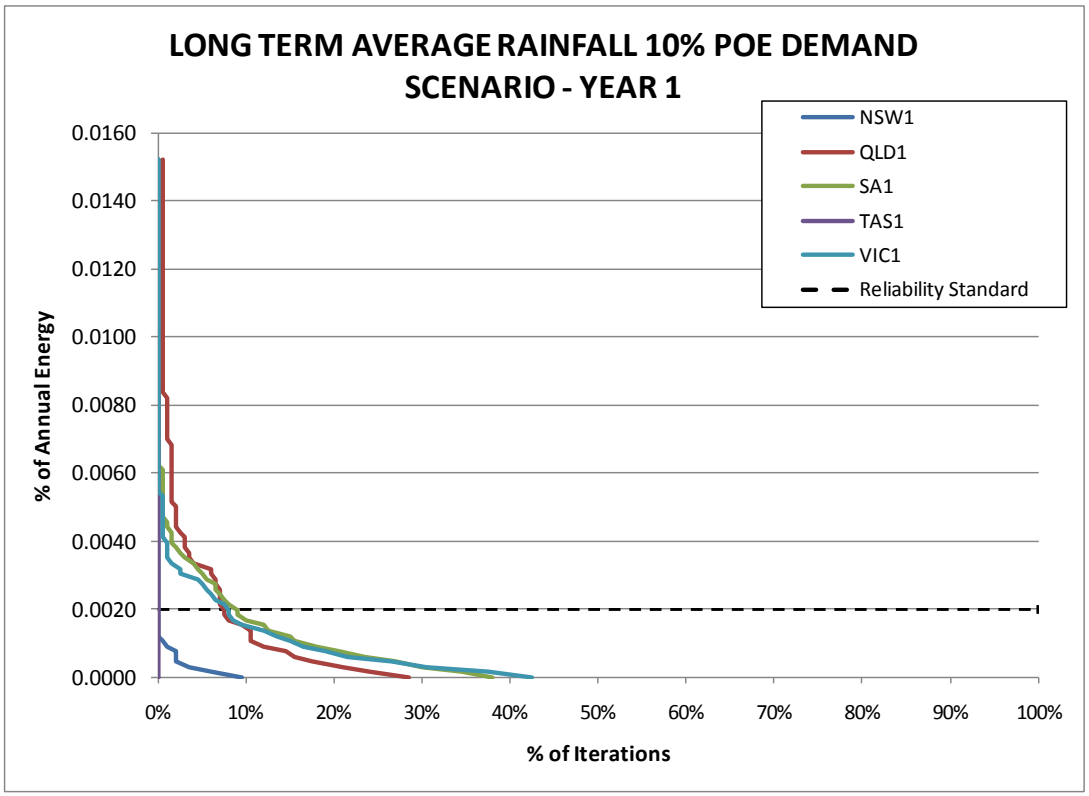

LOW RAINFALL 50% POE DEMAND SCENARIO - YEAR 2
0.0100
0.0090
0.0080
0.0070
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard

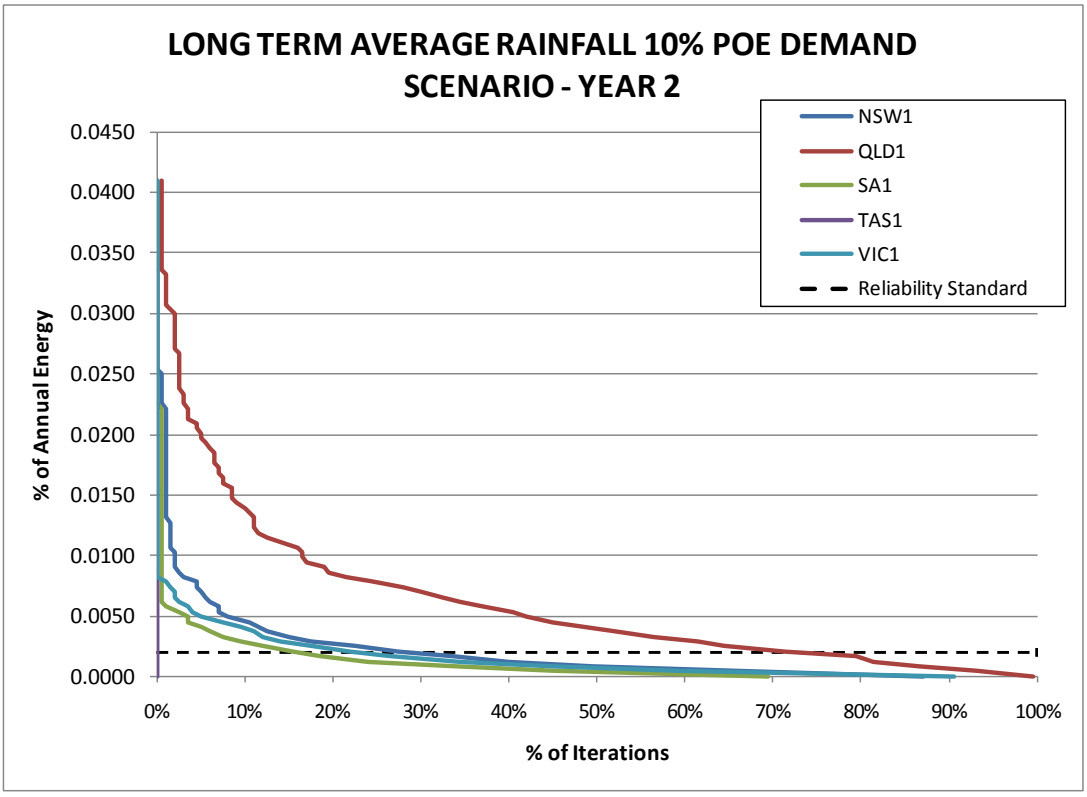

SHORT TERM AVERAGE RAINFALL 10% POE DEMAND SCENARIO - YEAR 1
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations

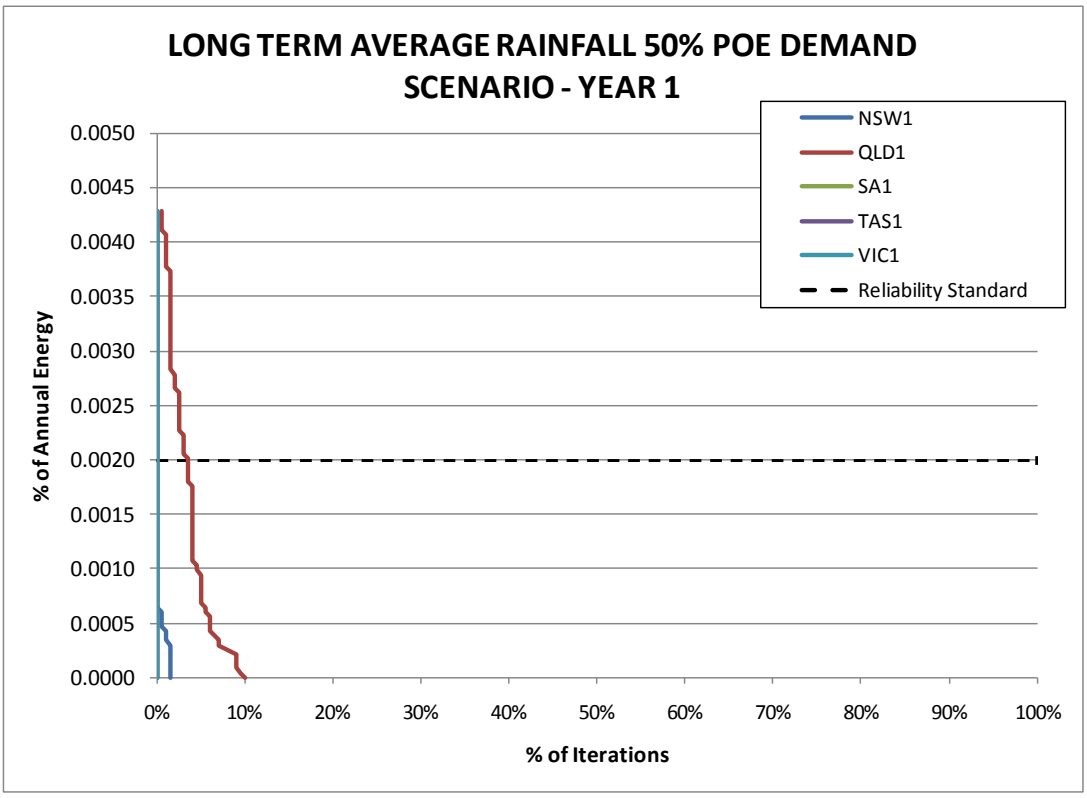

SHORT TERM AVERAGE RAINFALL 10% POE DEMAND SCENARIO - YEAR 2
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0450
0.0400
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations

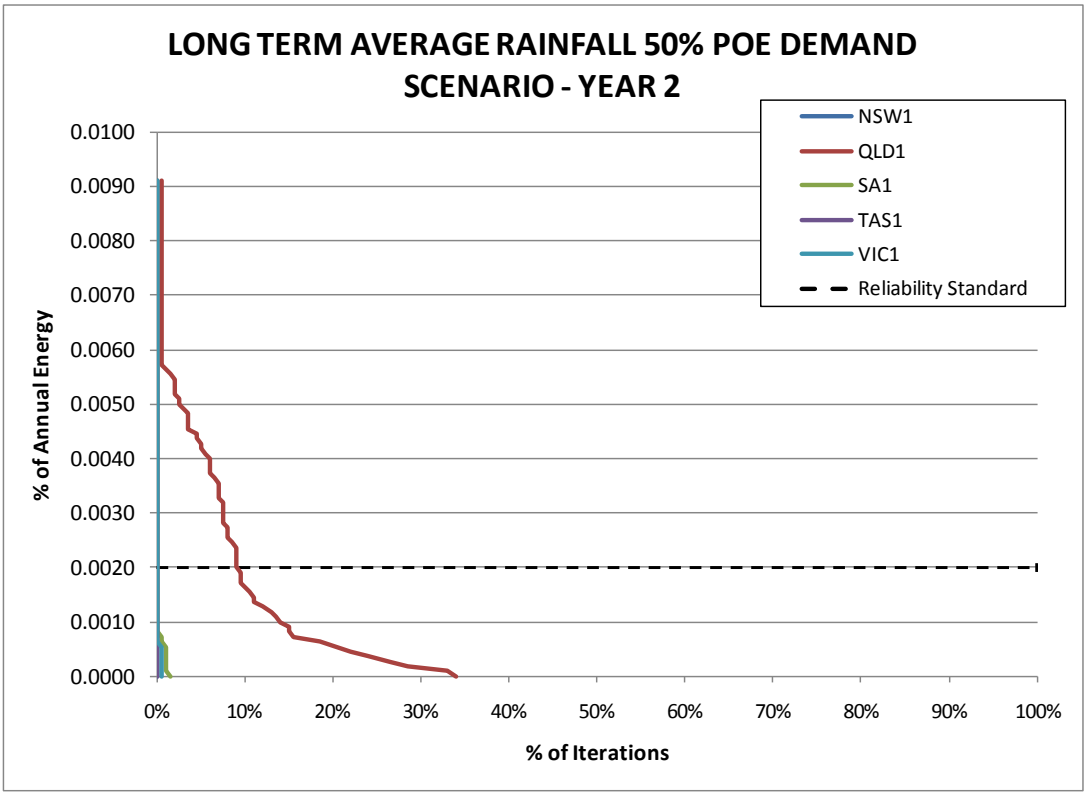

SHORT TERM AVERAGE RAINFALL 50% POE DEMAND SCENARIO - YEAR 1
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations


SHORT TERM AVERAGE RAINFALL 50% POE DEMAND SCENARIO - YEAR 2
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
0.0100
0.0090
0.0080
0.0070
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
% of Annual Energy
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations


LONG TERM AVERAGE RAINFALL 10% POE DEMAND SCENARIO - YEAR 1
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations


LONG TERM AVERAGE RAINFALL 10% POE DEMAND SCENARIO - YEAR 2
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0450
0.0400
0.0350
0.0300
0.0250
0.0200
0.0150
0.0100
0.0050
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations


LONG TERM AVERAGE RAINFALL 50% POE DEMAND SCENARIO - YEAR 1
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0050
0.0045
0.0040
0.0035
0.0030
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations


LONG TERM AVERAGE RAINFALL 50% POE DEMAND SCENARIO - YEAR 2
NSW1
QLD1
SA1
TAS1
VIC1
Reliability Standard
% of Annual Energy
0.0100
0.0090
0.0080
0.0070
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
0.0000
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
% of Iterations