imo
Independent Market Operator

Statement of Opportunities

July 2009

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Executive Summary

The Statement of Opportunities Report (SOO) is published annually by the Independent Market Operator (IMO). The SOO provides information to present and potential participants in the Wholesale Electricity Market (WEM) and other industry stakeholders.

The SOO focuses on opportunities for investment in generation capacity and Demand Side Management (DSM) over the medium term. The 2009 SOO places emphasis on the 2011/12 and 2012/13 Capacity Years. The report sets the amount of capacity required to be available from 1 October 2011, a key parameter of the Reserve Capacity Mechanism in the WEM.

Information is also provided on forecast maximum demand and electricity consumption within the South West Interconnected System (SWIS) over the LT PASA[1] Study Horizon through to October 2020.

Key Results for 2011/12

- The Reserve Capacity Target for 2011/12 is set at 5,191 MW.
- Forecast average growth through to 2019/20 is 4.3% for peak demand and 3.3% for energy.
- The IMO anticipates that 5047 MW of generation and DSM capacity, either existing or under construction with Capacity Credits for 2010/11, will continue in service through to 2011/12.
  - This value allows for the planned retirement of Kwinana A in 2011 (240MW).
- An additional 145 MW of new capacity, beyond that already in service or under construction, will be required to meet the Reserve Capacity Target in 2011/12.

In May this year, the IMO completed its annual Expression of Interest process to identify new sources of generation and DSM capability for 2011/12.

Twenty-six Expressions of Interest were received, covering a total nameplate capacity of 1279 MW. The amounts of each type of capacity are shown in the following table.

Type of Capacity in the EOI process	Aggregate Nameplate Capacity
Thermal	750 MW
Renewable	479 MW
DSM	50 MW
Total	1279 MW

[1] Long-Term Projected Assessment of System Adequacy

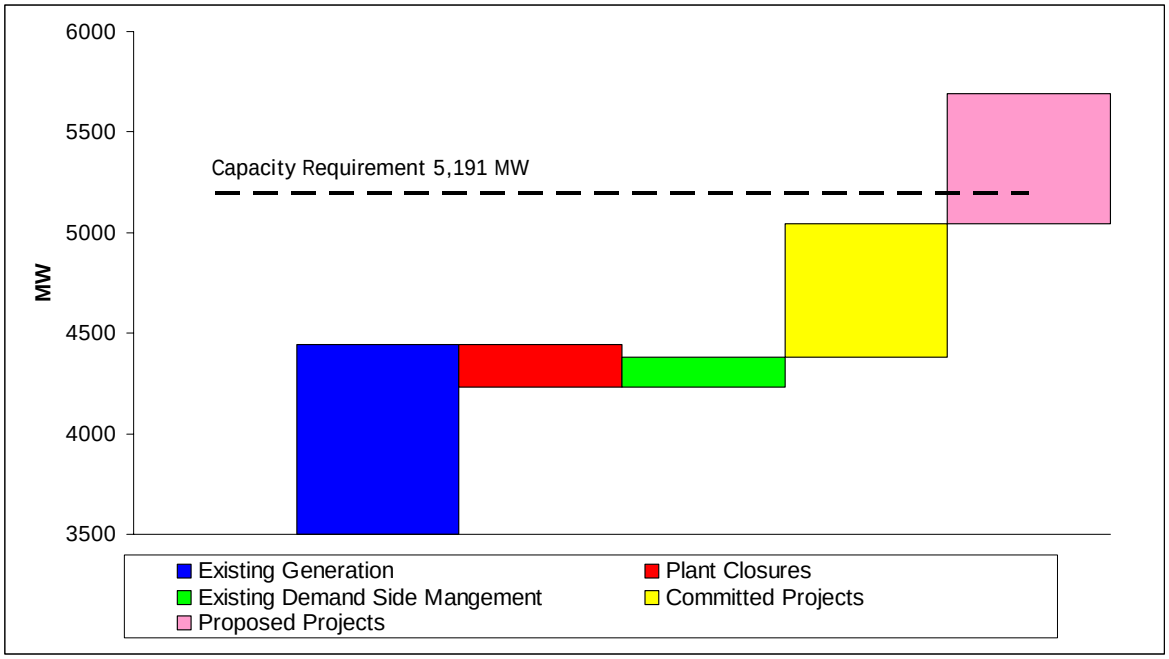
Taking account of intermittent generation, the potential certified capacity of the 26 projects in the expressions of interest is in the order of 1018 MW.

The IMO estimates that 642 MW of this capacity could potentially be available to meet demand in the 20011/12 year. This estimate does not include capacity that would depend on yet to be confirmed transmission works and takes account of more recent information provided by project owners relating to the progress of project financing.

On this basis, there appears to be more than sufficient potential new generation and DSM to meet the 145 MW identified as additional capacity required for 2011/12.

Figure A illustrates the expected status of capacity in the SWIS in the 2011/12 Reserve Capacity Year.

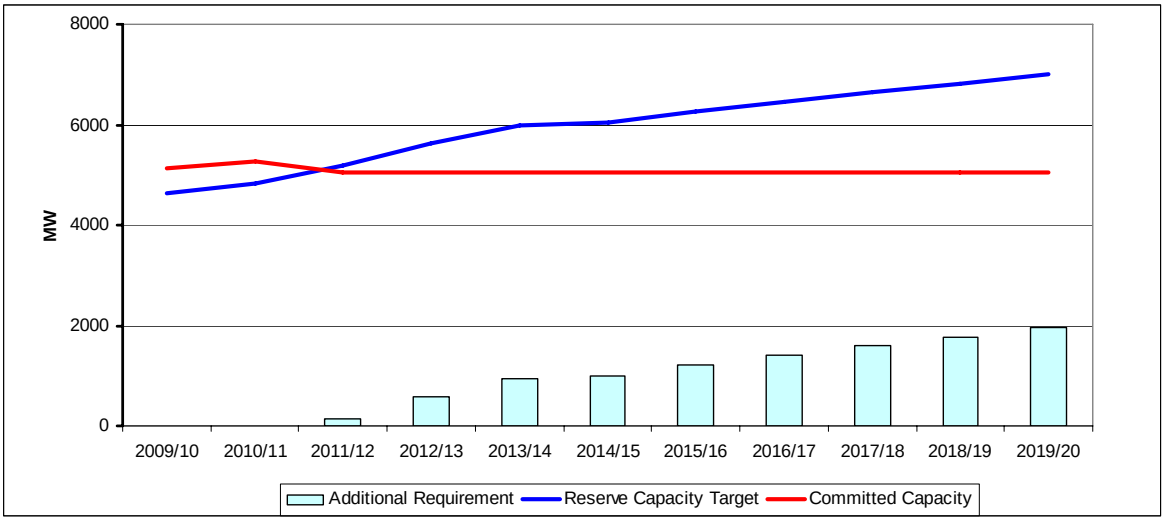
Figure A - Forecast Reserve Capacity Status for 2011/12



Supply Demand Balance

Figure B shows the supply-demand balance over the period 2009/10 through to 2019/20.

Figure B – Supply Demand Balance for the period 2009/10 to 2019/20



Key points to note from Figure B are:

- Sufficient Capacity Credits have been procured to meet the Reserve Capacity Requirement during 2009/10 and 2010/11.
- Additional Capacity Credits will be needed to meet the Reserve Capacity Target from 2011/12 to service demand growth and to replace capacity retired at Kwinana Power Station Stage A.
- By 2019/20 the total capacity requirement is forecast to be 6,999 MW.

There is substantial opportunity for investment in generation and DSM capacity in Western Australia. Notwithstanding the recent downturn in economic activity, State economic growth averaging 3% per year is expected over the coming decade. Approximately 2000 MW of new capacity will be required over the coming decade to meet load growth.

This represents an excellent opportunity for new and existing investors in the Wholesale Electricity Market.

Importance of New Transmission Works

The timing of new northern and southern transmission works planned by Western Power is of particular importance for the 2011/12 Capacity Year. These works impact on the size and timing of new large block loads and the connection and certification of a number of proposed new generators.

To develop the peak load forecast for 2011/12 the IMO must make a determination on which new loads will gain access to the network and be able to commence operation. New loads are not subject to any certification process and so will have an impact on the supply/demand balance from the time they gain access to the network and commence operation.

Three scenarios are relevant for the impact of the new transmission works:

1. New transmission works are in service prior to 1 December 2011 and this is confirmed in time to allow certification of affected generators.

2. New transmission works come into service after 1 December 2011, but during the 2011/12 peak demand season (December – March) so that affected new loads may be in place, but some new generators may not be available, or may not be considered reliable.

3. New transmission works come into service after the 2011/12 peak demand season, so that neither affected generators nor loads will be present during the peak demand season.

The following information has been made available to the IMO and has been used in making its decision about load and generation on the new northern 330kV transmission line:

- The new northern 330kV transmission line would need to be completed to Eneabba in order to fully supply major proposed mining loads in the region.
- The line has not yet received full regulatory approval from the ERA.
- No allocation has been made for capital contribution costs in the recently approved State budget process.
- Western Power is unable to offer transmission access to generators at present.
- Western Power has provided the IMO with indications of the timing schedule for works to this line.
- Western Power has secured the necessary environmental approvals.

On the balance of probabilities, given the status of the various funding and regulatory approvals and the timing schedule needed to construct and commission the line, the IMO has concluded that the line is unlikely to be in place prior to the 2011/12 summer period (December - March), but that it may be operating during the remainder of the 2011/12 year.

Some additional Mid-West load (55 MW) has been allowed for in 2011/12, based on information from Western Power on limited spare capacity in the existing network.

For the 2012/13 forecast demand of 5,132 MW it has been assumed that the new transmission works are in service and the allowance for major loads has been increased by around 200 MW on the assumption that major Mid-West mining loads are operational by that time.

The size and timing of these loads is not yet certain. Among other things, this uncertainty relates to the progress of recovery from the global financial crisis, regulatory approvals and the outcome of Government reviews presently underway in relation to transmission works and other support infrastructure.

The Reserve Capacity Target for 2012/13 will be set in the 2010 SOO. By that time, much of the present uncertainty will have been resolved, allowing a forecast for 2012/13 to be made on the most up to date information available at that time.

Certainty of network access is a prerequisite for certification under the Reserve Capacity Mechanism.

An essential requirement for certification is that a new generator will be in service no later than 30 November 2011. All new generators must provide the IMO with sufficient evidence for it to satisfy itself that this can be achieved.

As a result of this decision, the IMO also expects that it will be unlikely to be able to certify new generation plant which is reliant on the new northern transmission works for the 2011/12 Capacity year.

The Reserve Capacity Mechanism

The SOO is a key element of the Reserve Capacity Mechanism - the mechanism through which the Western Australian Electricity Market (WEM) secures capacity to meet peak demand. Retailers of electricity must secure enough Certified Reserve Capacity to meet their demand plus an allowance for reserves.

The SOO specifies the future demand needs and the opportunity for parties to invest in and develop new generation and DSM capability.

The Reserve Capacity Mechanism has provided excellent outcomes for the Western Australian market and is attracting interest from investors in generation from across the nation and internationally. Approximately 2,180 MW of new generation plant and DSM have been committed over the last 5 years in the Reserve Capacity Mechanism to enter the market by 2010/11.

This level of investment is an outstanding outcome for Western Australia. Not only is this investment helping to ensure reliability of supply, but the increasing number of market participants and range of capacity types is providing greater competition in the market.

The IMO has recently published a Reserve Capacity Mechanism Review Report which provides information about the historic performance of the Mechanism. The report can be accessed through the IMO website[2].

Next Steps

Parties offering a generation or a DSM facility as Reserve Capacity must register with the IMO as a Market Participant and must register their facilities. Market Participants must then apply for their facilities to be certified and apply to be assigned Capacity Credits.

Certification is required for all new and existing facilities. Applications for Certification of Reserve Capacity of generation and DSM capacity for the 2011/12 Reserve Capacity Year are now open and must be provided to the IMO by 5:00 PM WST on Monday, 20 July 2009.

Further information on the Reserve Capacity process is available on the IMO website at http://www.imowa.com.au. Parties planning to participate in these processes should familiarise themselves fully with the requirements of the relevant Market Rules and Market Procedures. Parties intending to participate in the Market for the first time are strongly encouraged to contact the IMO at an early stage to discuss the market requirements for new entrants.

[2] http://www.imowa.com.au/Attachments/ReserveCapacity/RCM_ReportV5_PUBLISHED.pdf

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Requirements of the Wholesale Electricity Market Rules

The following table is provided to assist readers wishing to find particular information in this report as required by the Market Rules. Market Rule 4.5.13 specifies the information that must be included in the Statement of Opportunities Report. The table below provides links to the appropriate section of the report for each of these items.

Market Rule	Report Section Where Item is Addressed
4.5.13. The Statement of Opportunities Report must include: (a) the input information assembled by the IMO in performing the Long Term PASA study including, for each Capacity Year of the Long Term PASA Study Horizon: i. the demand growth scenarios used;	Section 4 Appendices 2, 3 and 4
ii. the generation capacities of each generation Registered Facility;	Appendix 7
iii. the generation capacities of each committed generation project;	Appendix 7
iv. the generation capacities of each probable generation project;	Section 5.8
v. the Demand Side Management capability and availability;	Section 5.7
vA. the amount of Reserve Capacity forecast to be required to serve the aggregate Intermittent Load;	Section 5.3
vi. the assumptions about transmission network capacity, losses and network and security constraints that impact on study results; and	Section 5.5
vii. a summary of the methodology used in determining the values and assumptions specified in (i) to (vi), including methodological changes relative to previous Statement of Opportunities Reports;	Sections 3, 4 and 5
(b) the Reserve Capacity Target for each Capacity Year of the Long Term PASA Study Horizon;	Section 5.3
(c) the amount by which the installed generation capacity plus the Demand Side Management available exceeds or falls short of the Reserve Capacity Target for each Capacity Year and each demand growth scenario considered in the study;	Section 5.5 Appendix 5
(d) the extent to which localised supply restrictions will exist while satisfying the Reserve Capacity Target for each Capacity Year and each demand growth scenario considered in the study;	Section 5.5
(e) a statement of potential generation, demand side and transmission options that would alleviate capacity shortfalls relative to the Reserve Capacity Target and to capacity requirements in sub-regions of the SWIS; and	Section 5.8
(f) the Availability Curve for the 2nd and 3rd Capacity Years of the Long Term PASA Study Horizon.	Section 5.4

1. Introduction

While Western Australia's growth is currently being affected by the global economic downturn, in the medium to long-term the State economy is forecast to recover significantly, driving growth in electricity demand.

Developers are making major investments in power generation capability within the SWIS. Over the past year, plans have been announced for further conventional generation in the metropolitan, south west and the Mid-West regions. At the same time Commonwealth and State Government measures to encourage renewable generation are stimulating proposals for windfarm and other renewable projects.

This Statement of Opportunities Report (SOO) is published to provide information to parties considering participation in the Reserve Capacity element of the Wholesale Electricity Market (WEM). It also provides electricity demand and consumption information for Market Participants and other interested parties. As such, the SOO is a key element in the Reserve Capacity Mechanism, a series of processes through which the IMO identifies the requirement for future generation and demand side management (DSM) capacity and facilitates the introduction of this capacity onto the SWIS.

The 2009 SOO provides updated expectations on the capacity available on the SWIS from that provided in the 2008 SOO and in the 2009 Summary of Expressions of Interest published in May 2009. Forecasts of key economic parameters, along with energy consumption and demand forecasts, are provided for the LT PASA Study Horizon, which extends to 2019/20.

Analysis on the current economic environment is provided and the report also includes a system load profile, typical load duration curves and forecasts of the winter peak demand.

2. Electricity Generation and Consumption in the SWIS

Historically, electrical output from power stations has been measured at two distinct points:

- at the generator terminals (which is a measure of the gross production level); and
- at the point where the electricity is sent out from the power station (the net amount of electricity exported onto the transmission grid).

As the WEM uses sent-out capacity quantities, the information provided in the SOO is presented in terms of sent-out capacity expressed in megawatts (MW), unless otherwise specified. Energy production is also presented in sent-out terms and is measured in gigawatt-hours (GWh).

2.1 2008/09 Summer Weather and Maximum Demands

Electricity demand in the SWIS is strongly correlated with the daily temperature in the metropolitan area. Summer maximum temperatures can range from the mid-twenties to the mid-forties, with consequent daily peak electricity demands from below 2,000 MW to above

4,000 MW. Typically, the highest maximum demands are recorded when there is a sequence of hot days with high overnight temperatures.

The Reserve Capacity Target is based on meeting a maximum demand that has a probability of occurring in only one year in ten.

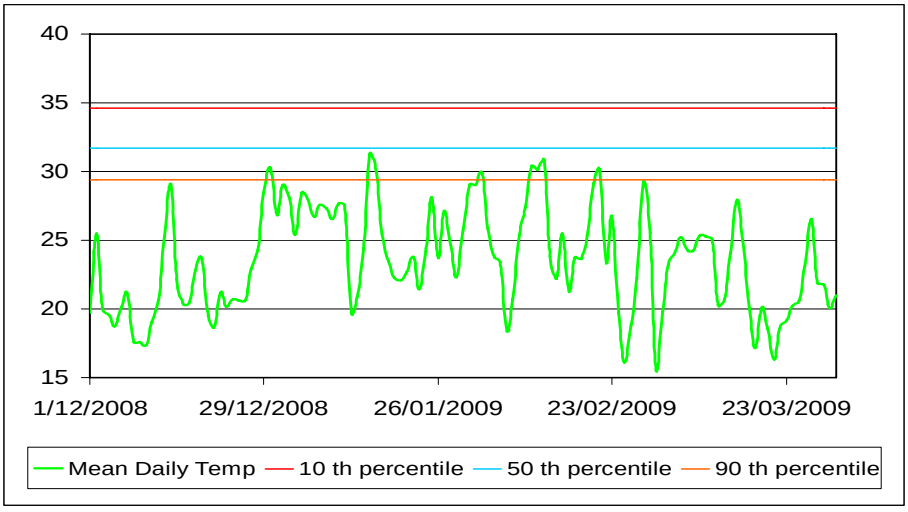
The Hot Season for the SWIS is defined as the period 1 December through to 31 March inclusive. The highest maximum demands are expected between mid-January and mid-March. The maximum demand on any particular day also depends on whether hot weather events occur on a business day, when demand is naturally higher than on a weekend or public holiday.

In 2008/09, Perth experienced summer conditions very similar to historic averages. The temperatures were less than 1°C lower than the historic average in December. Higher temperatures occurred during January before average conditions returned through February and March.

Figure 1 shows the Perth mean daily temperatures (the arithmetic mean of the daily maximum and daily minimum temperature) from December 2008 through March 2009 as published by the Bureau of Meteorology comparatively against the Probability of Exceedance levels given by the National Institute of Economic and Industry Research (NIEIR) which prepares the forecasts provided in this document.

Figure 1 – Perth Temperatures November 2008 to March 2009

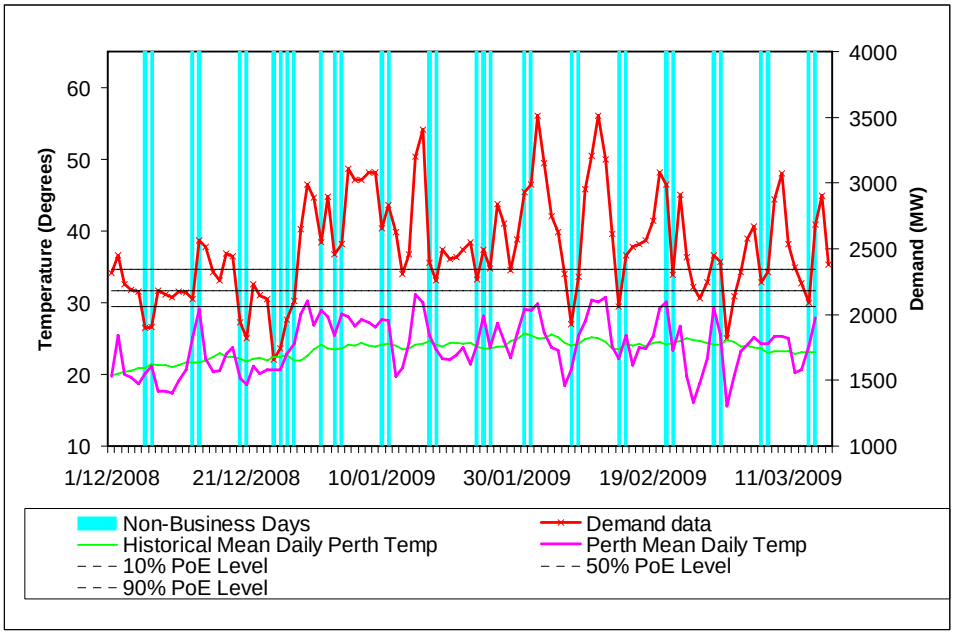
(source: Bureau of Meteorology)



From Figure 1 it can be seen that the peak mean daily temperature was only just below the 50% Probability of Exceedance level, or 50% POE. There were no days when the mean daily temperature reached 10% POE levels. There were five occasions when the mean daily temperature exceeded the 90% POE level that could result in a maximum demand event (i.e. could result in a peak demand event that will be exceeded 9 out of 10 years).

As shown in Figure 2, the peak demand day occurred on 11 February 2009. A number of other periods of hot weather were experienced in December 2008 and January 2009. Mean temperatures through this period were modest.

Figure 2 – Maximum Perth Temperature on Business and Non-Business Days



The highest Hot Season mean daily temperature of 31.2°C was recorded on 15 January 2009 which was followed by 30.0°C on 16 January 2009. These high temperatures were not maintained and because these days were during the traditional Christmas 'holiday period' the maximum demand peaked at just over 3,400 MW.

On 11 February 2009 the mean daily temperature reached the fourth highest level for the summer period at 30.1°C. This corresponds to approximately a 77% POE level, noting that it was a relatively normal summer. Maximum demand peaked on that day at 3,515 MW.

Table 1 shows the difference between the actual peak demand in 2009 and forecasts provided in 2006, 2007 and 2008. The forecasts have been corrected for the actual temperature conditions on the peak demand day in 2009 and to allow for the absence of anticipated demand from Boddington.

Table 1 : Temperature Corrected Forecast Accuracy

Maximum demand =3515 MW		Accuracy (MW)	Accuracy (%)
2005 Temperature Corrected Forecast	3356 MW	-159	-4.5%
2006 Temperature Corrected Forecast	3400 MW	-114	-3.3%
2007 Temperature Corrected Forecast	3509 MW	-6	-0.2%
2008 Temperature Corrected Forecast	3529 MW	14	0.4%

Table 1 shows that the forecast maximum demand provided in previous years is consistent with the actual maximum demand, particularly for the 2007 and 2008 forecasts.

The lower accuracy for the 2005 and 2006 forecasts was a result of the unexpected increases in economic conditions that Western Australia and Australia experienced since that time that were not accounted for in the forecasts. In general, improved accuracy of forecast is expected as the date of forecast becomes closer to the Capacity Year being forecast.

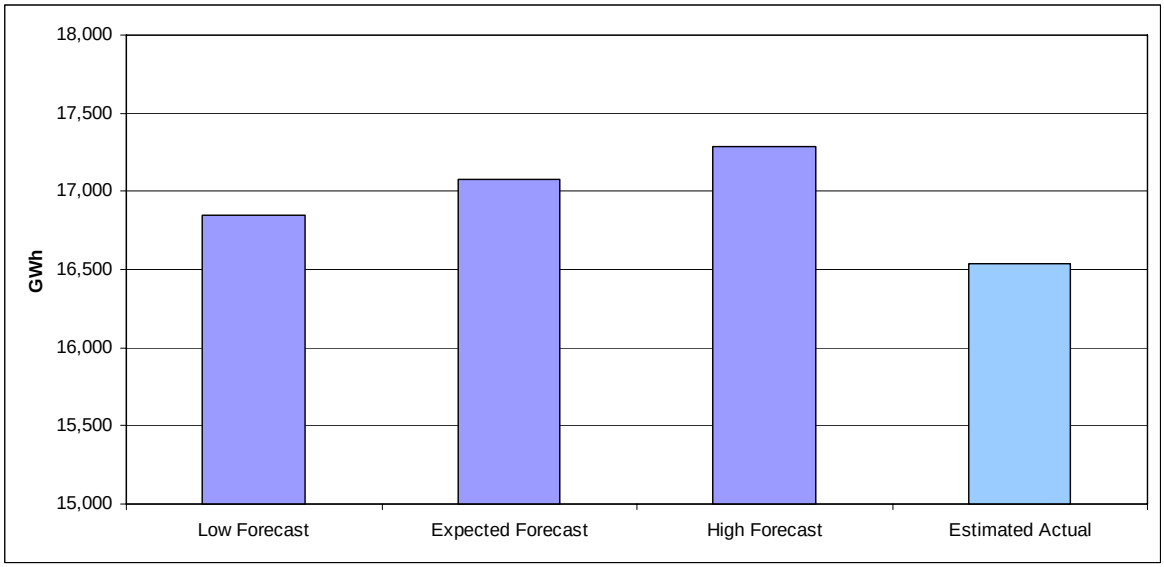
2.2 Actual Sent-Out Energy

While peak demand for 2008/09 was close to forecast, electricity consumption for the 2008/09 year has been lower than expected, reflecting the lower than expected economic activity.

Figure 3 compares forecast energy from the 2008 SOO for Expected, Low and High economic growth cases with the estimated actual energy consumption for the 2008/09 year of 16,533 GWh. This estimate comprises nine months of actual data plus three months forecast to the end of June 2009.

The actual energy consumed is below the forecasts provided in the 2008 SOO. One of the factors which have led to this difference is the much lower level of economic activity than was forecast. This factor caused the actual energy sent out being approximately 2% below the low economic forecast case and 3.2% below the expected forecast.

Figure 3 – Comparison of Actual and Forecast Sent-Out Energy for 2008/09



2.3 SWIS Load Duration Curve

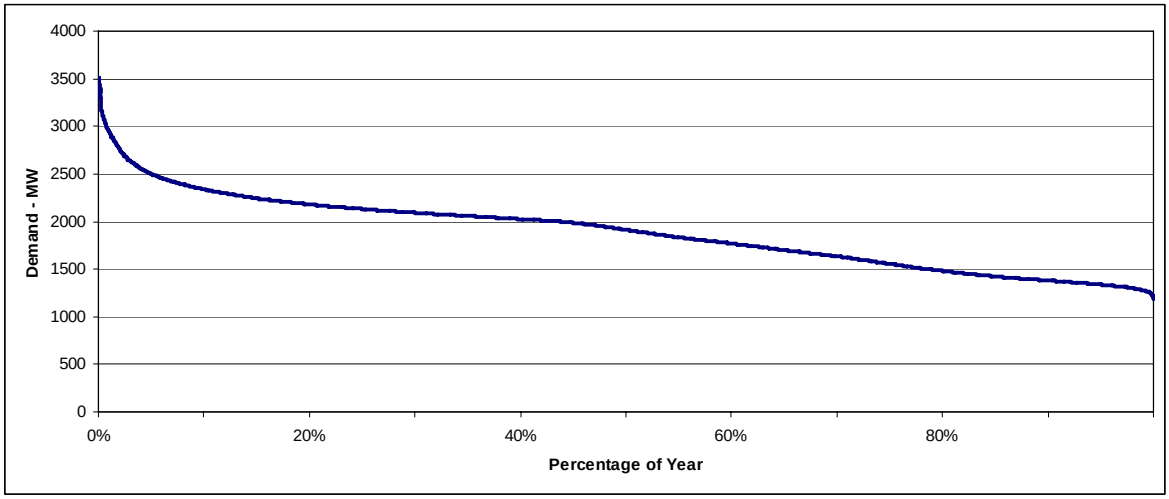
As with any product, the final cost of producing electricity is partly determined by the extent to which production capacity is fully utilised. If average demand is significantly below peak demand, a higher portion of peaking plant will be needed to provide capacity during the times of peak demand.

How demand varies in an electricity system can be presented in a load duration curve. This shows the demand in the system against the percentage of time for which it is achieved or exceeded.

This information gives an insight into the likely optimum mix of generation types. Typically generators with lowest running cost have the highest capital cost and vice versa. Cost is generally minimised if demand levels that only occur for a small part of the year are supplied from generators with low capital cost, even though the running costs of this type of plant (e.g. diesel fuel cost) may be high. Conversely, demand that is present most of the time is best supplied from generators with low running cost, even though their capital costs may be high.

Figure 4 shows the load duration curve for the period from April 2008 through to March 2009.

Figure 4 – Load Duration Curve April 2008 to March 2009



The most significant factors shown in this figure are that:

- The load exceeded 90% of the annual maximum, i.e. 3,163 MW, for less than 0.5% of the year (53 trading intervals), compared with 1% last year.
- The load exceeded 80% of the annual maximum, i.e. 2,812 MW, for only 1.7% of the year (303 trading intervals) compared with 3% last year.

- The mean load over the year was 1,885 MW, which is 54% of the maximum demand compared with 55% last year.

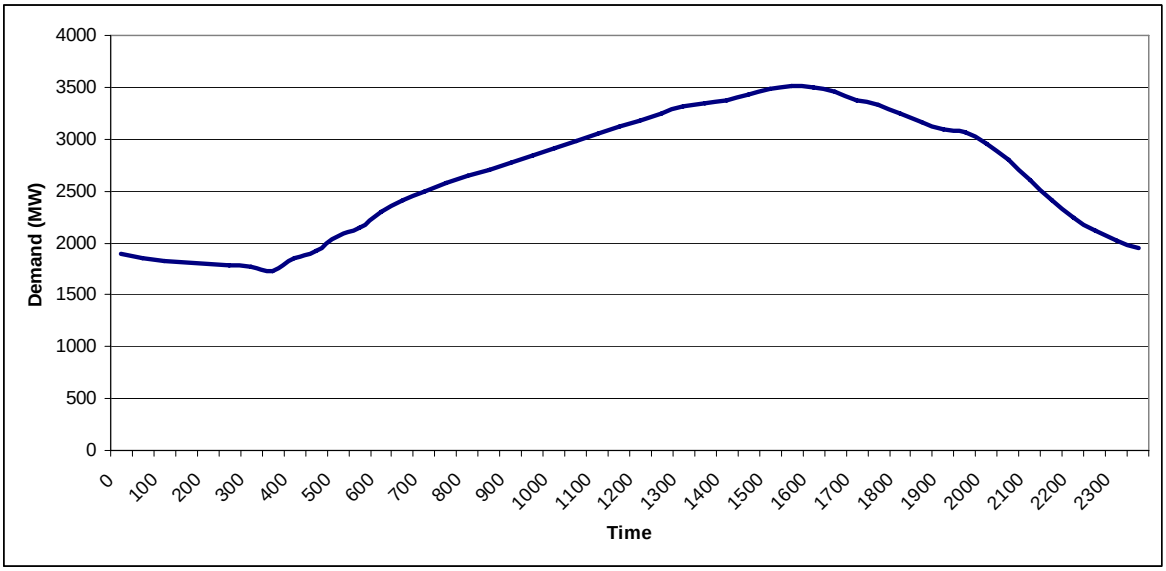
- The minimum load was 1,185 MW at 3:00 AM on 14 June 2008 compared with 1,186 MW last year.

This data suggests the load profile has a greater emphasis towards peak load than last year. However, it is difficult to determine whether this indicates a significant trend or is simply the result of underlying year to year variation.

2.4 Typical SWIS Daily Load Shape

Electricity demand varies substantially through each day with overnight loads being markedly lower than daytime demand. Figure 5 illustrates the level of demand in each trading interval on 11 February 2009, the day of highest maximum demand. Appendix 6 includes further daily load curves covering the winter day with the highest maximum demand and typical autumn and spring days.

Figure 5 – Daily Load Curve 2009 Peak Demand Day



2.5 Information on Market Generators

2.5.1 Capacity Credits by Fuel Type

As discussed in section 2.3, a mix of generator types is needed to minimise the overall cost of producing electricity. This is also relevant for the fuel type used by generators.

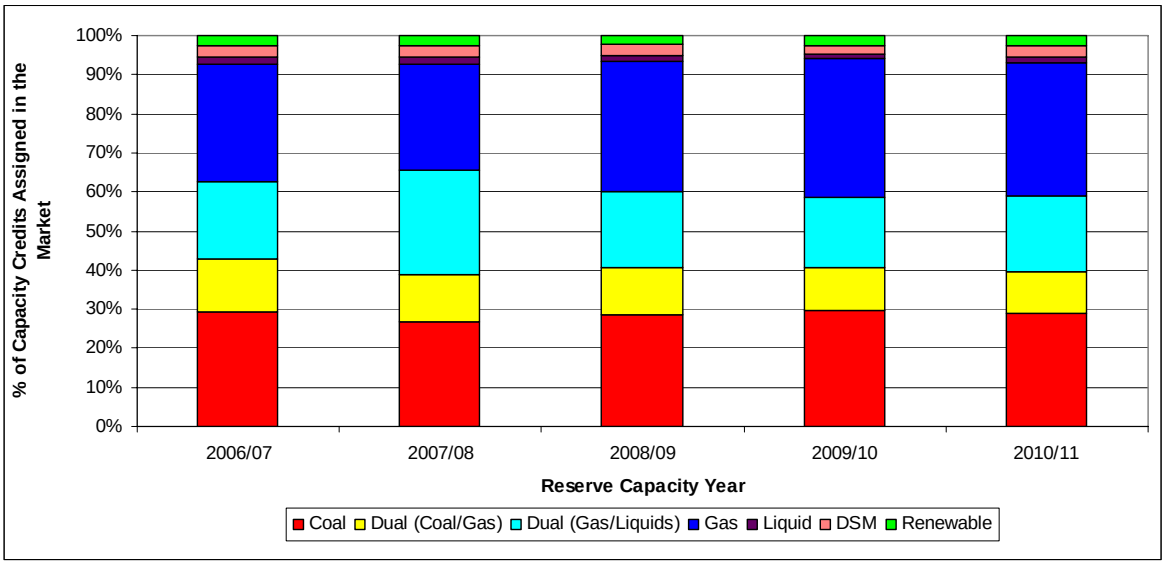
Highly utilised generators will usually use low cost fuels such as coal or natural gas. However, low cost fuels can incur large fixed costs for transport, storage and processing. These high costs can be warranted if utilisation is high.

Conversely, plants operating only rarely may have lower total costs if other fuels are used – perhaps with higher unit costs, but lower fixed costs. For example, high cost distillate fuel can be the best choice for plants which will run only at peak demand times.

Importantly, a range of fuel types also provides insurance against failures or restrictions in the supply of a particular fuel type. For instance, access to coal-fired and distillate fired generation capacity was very important in minimising the impacts of the Varanus Island gas supply disruption in 2008.

There is a healthy mix of fuel types in the SWIS. To illustrate this, Figure 6 illustrates the proportion of Capacity Credits provided by generators using each fuel type, since market commencement in 2006:

Figure 6 – Percentage of Capacity Credits by Fuel Type



A key observation from this figure is that the system is gradually becoming more reliant on generation that can fire on gas only. Also, the percentage of dual fuel capacity is decreasing and liquids-only plant shows little change across the period.

Dual fuel and liquids-only plant played an important part in maintaining system reliability and security during the recent Varanus Island incident.

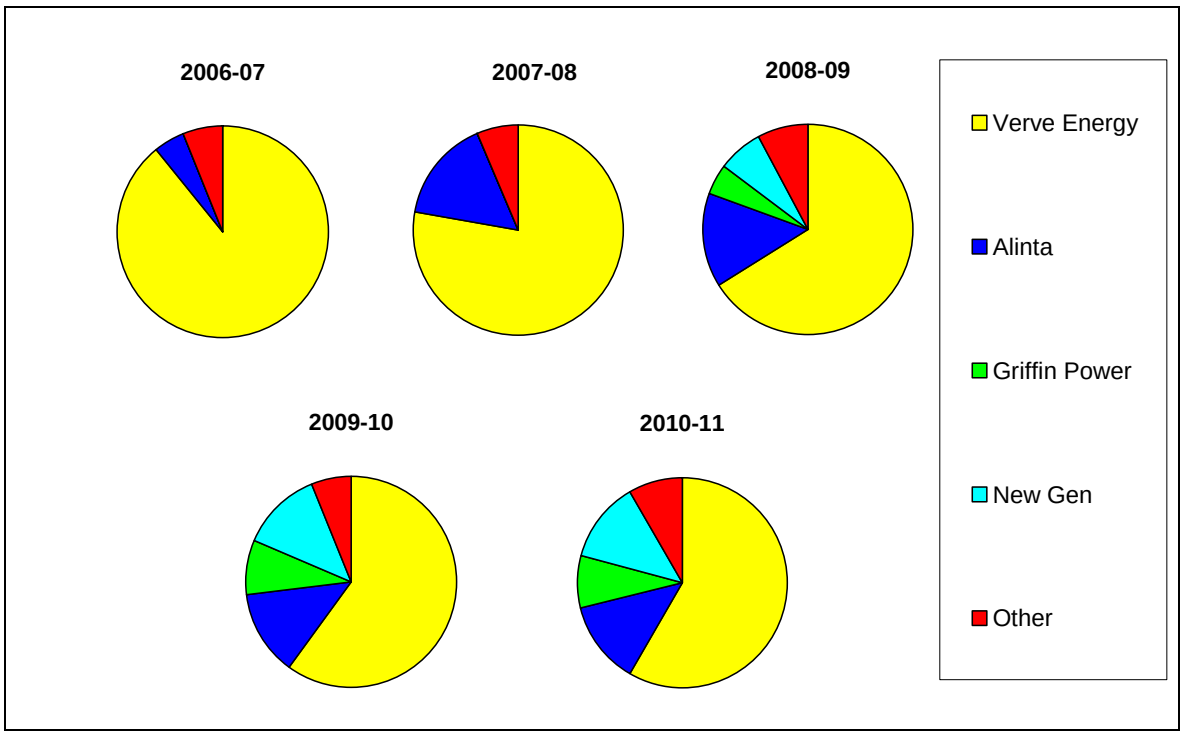
The IMO is investigating ways to incentivise investment in dual fuel capability through the Reserve Capacity Mechanism for future Capacity Years.

2.5.2 Capacity Credits by Market Participant

Figure 7 shows the Capacity Credits assigned to Market Participants as a percentage of the total number assigned in the SWIS for the 2009/10 and 2010/11 Reserve Capacity Years.

This illustrates the decrease in the relative share of the capacity market held by Verve Energy as a result of the capacity cap placed on it by Government and the increase in private capacity. In 2010/11, Verve Energy will hold 58% of Capacity Credits.

Figure 7 Capacity Credits by Market Participant

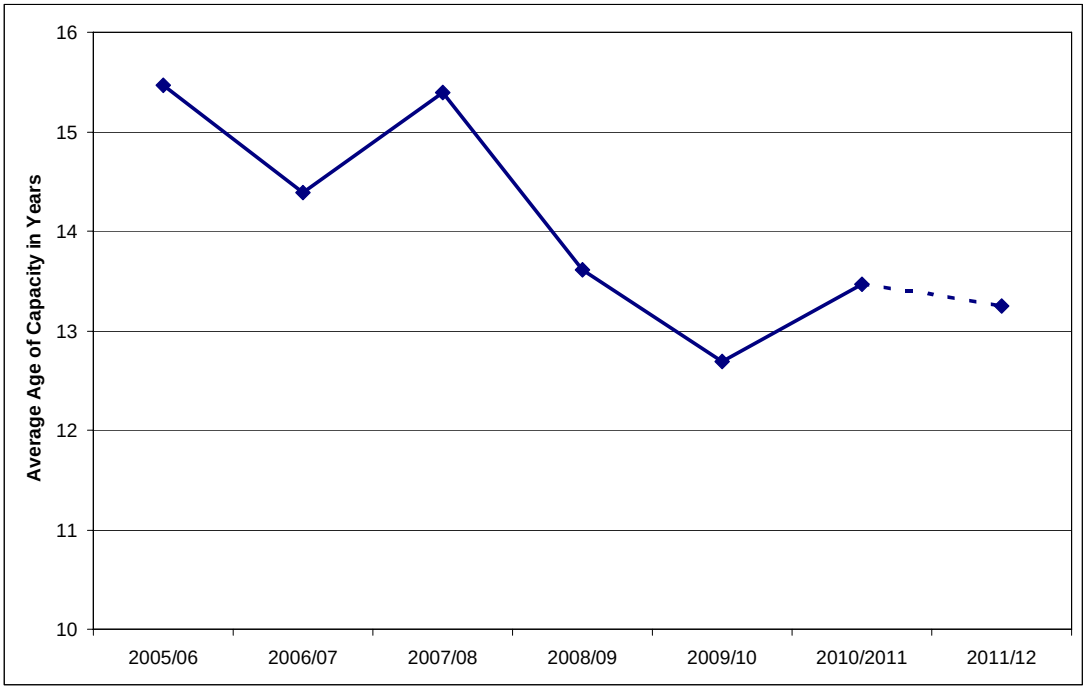


2.5.3 Age and Availability of Generation Plant

The age of generation plant can influence its efficiency, reliability, flexibility and production cost.

As can be seen in Figure 8, the average age of generating capacity on the SWIS has fallen significantly over the years since market start. This reflects the rapid introduction of new capacity over recent years and the retirement of older plant.

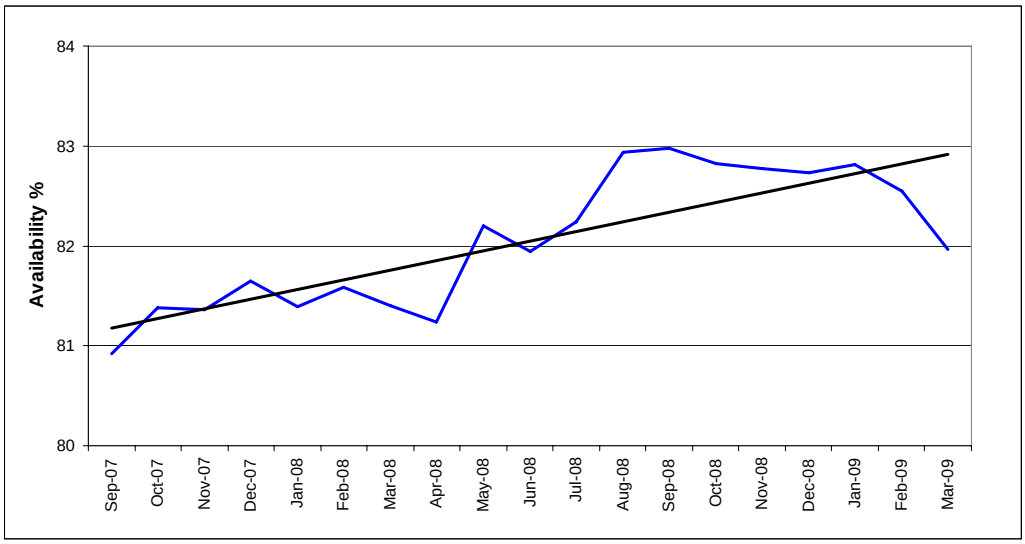
Figure 8 Average Age of Generation Capacity



Given that the economic life of a power station is typically more than 30 years, the average age of SWIS generation is relatively low. It is expected that the average age will fall further as the market continues to encourage the building of new plant. The average age will also fall with the retirement of Kwinana A plant in 2011.

Figure 9 shows a trend of increasing plant availability which is consistent with the reducing average plant age.

Figure 9 - 12 Month Rolling Average – Plant Availability



3. Economic Environment

3.1 Background

Economic forecasts are an important input in electricity forecasting. The electricity forecasts used by the IMO are provided by the National Institute of Economic and Industry Research (NIEIR). NIEIR has prepared all demand forecasts for the IMO since the IMO's inception. NIEIR was previously engaged by the then Western Power Corporation for forecasts used in the Generation Status Review from 2003 (a predecessor of the SOO). NIEIR has extensive experience in forecasting in Australia over several decades.

NIEIR's approach includes a top-down consideration of the Australian economy, from which forecasts are developed for Western Australia and the region served by the SWIS. These economic forecasts, combined with historic electricity demand data and projections of air conditioning demand, are major determinants of the final electricity forecasts. The forecasting methodology is discussed further in section 4 of this report.

The level of economic activity has both a general and specific impact on the maximum demand for, and consumption of, electricity. Buoyant economic conditions encourage the purchase of discretionary items such as air conditioning systems and plasma televisions. Construction of new dwellings is strongly correlated with the strength of the economy. This leads directly to the purchase and usage of electrical appliances and demand for basic materials.

Resource extraction, processing and export are significant to the Western Australian economy and to electricity demand growth. Some of these activities have a direct impact on demand in the SWIS. Of particular relevance at present, are proposed iron ore developments that have substantial power needs for mineral processing.

Major developments in regional areas outside of the SWIS can have a significant impact on SWIS electricity demand:

- Much of the design, procurement and management support is provided by personnel based within the Perth metropolitan area.
- Much of the fly-in/fly-out workforce resides in the SWIS.
- Substantial quantities of basic materials and equipment are sourced from within the SWIS.
- This economic activity can encourage overseas migration to Western Australia.

The forecasts included in this report show a decrease in the economic growth rates compared with those in the 2008 SOO. These decreases flow though to a decrease in the forecast growth rate for electricity demand and consumption through to 2012. This chapter includes discussion on changes in economic outlook which have occurred since the 2008 SOO. A comparison is also provided between NIEIR's forecasts and a number of other publicly available forecasts.

3.2 Economic Outlook

Figure 10 shows the forecasts of growth, measured by GDP and GSP, through to 2019/20 for the Expected, High and Low growth cases.

NIEIR forecasts that Australia's annual average economic growth over the period to 2019/20 will be close to 2% while the Western Australian economy is expected to grow faster at close to 3% per year over the same period. By comparison, the 2008 SOO reported growth rates through to 2017/18 of 3% and 5% for GDP and GSP respectively. A detailed comparison of 2008 and 2009 GDP and GSP forecasts for the short term is provided later in this chapter (Figures 12 and 13).

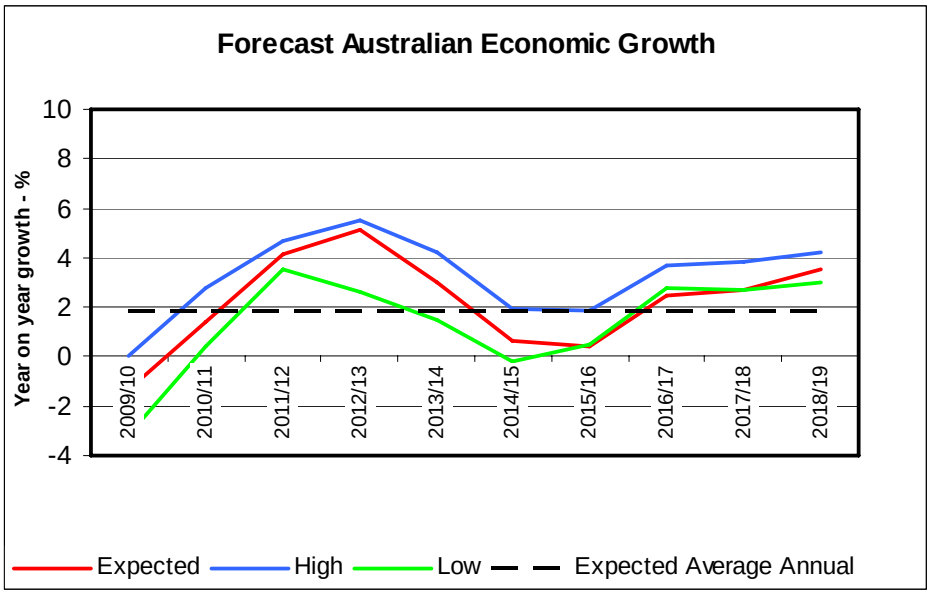
Over the last several years, the resources boom has resulted in rapid growth in Western Australia with flow-on effects in the general economy including the Perth region. However, the effect of the global economic slowdown has postponed and/or shutdown a number of major resource developments. This is expected to contribute to a broader slowdown in the local economy.

Negative GSP growth is forecast in Western Australian in 2009/10 and 2010/11. Business investment in Western Australia is forecast to fall by 42% over these two years. Private consumption expenditure growth is expected to be negative in 2009-10.

The forecasts presume a rapid GSP recovery by 2012/13, growing by 8.2% per annum in that year. This partly reflects the assumption that some large infrastructure projects will proceed (e.g. LNG) that are currently facing financing constraints, and a presumed increase in the level of capacity utilisation generally.

While 8.2% is high, especially given the global economic conditions at present, NIEIR predicts a further downturn in the following two years. This is why the long-term average growth rate is only around 3%.

Figure 10 – Forecast Australian and Western Australian Economic Growth



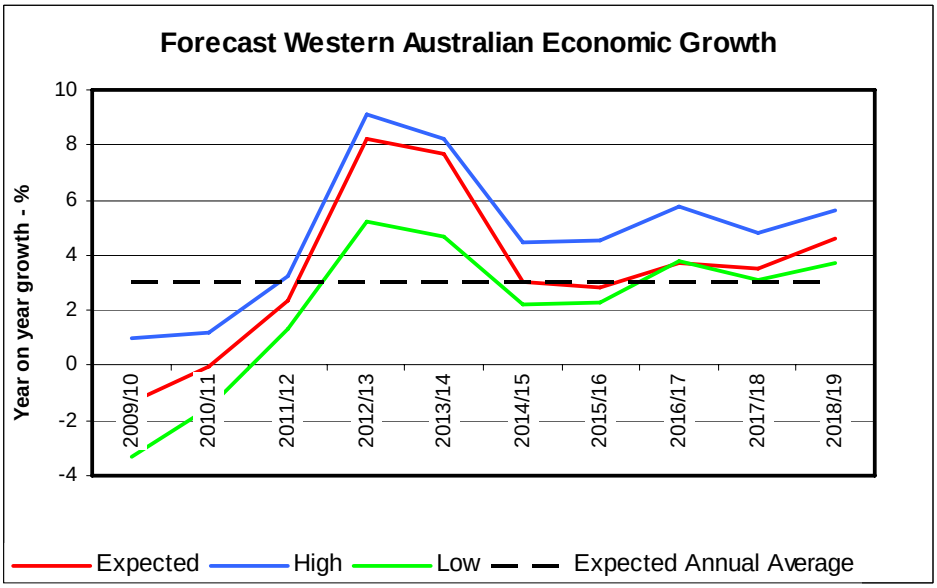
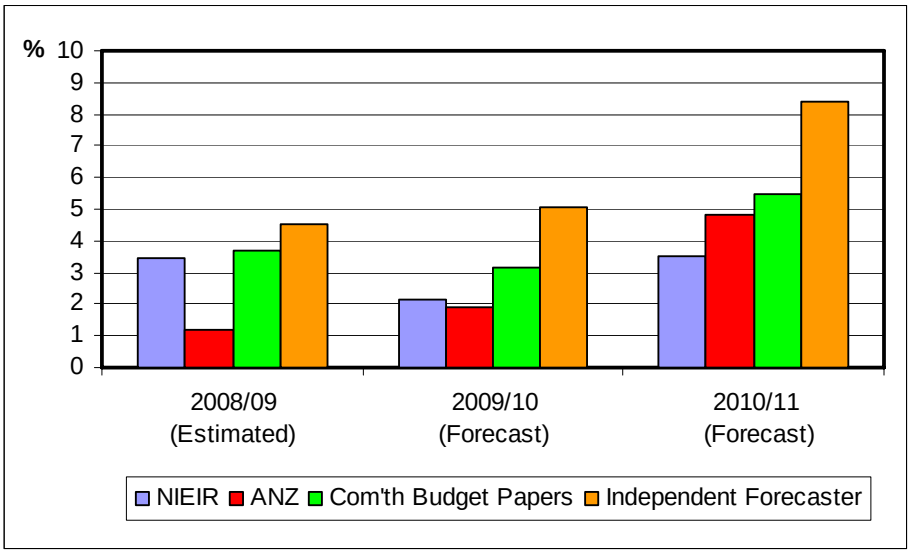


Figure 11 compares NIEIR's forecasts with those of three other organisations:

- the Commonwealth Government Budget Papers;
- the ANZ Economic Outlook; and
- a major independent forecaster.

This comparison is presented on a compounded basis to smooth out the variations that occur from year to year. The "Independent Forecaster" included in the graph has requested that it not be named.

Figure 11 – Compound Australian Economic Growth

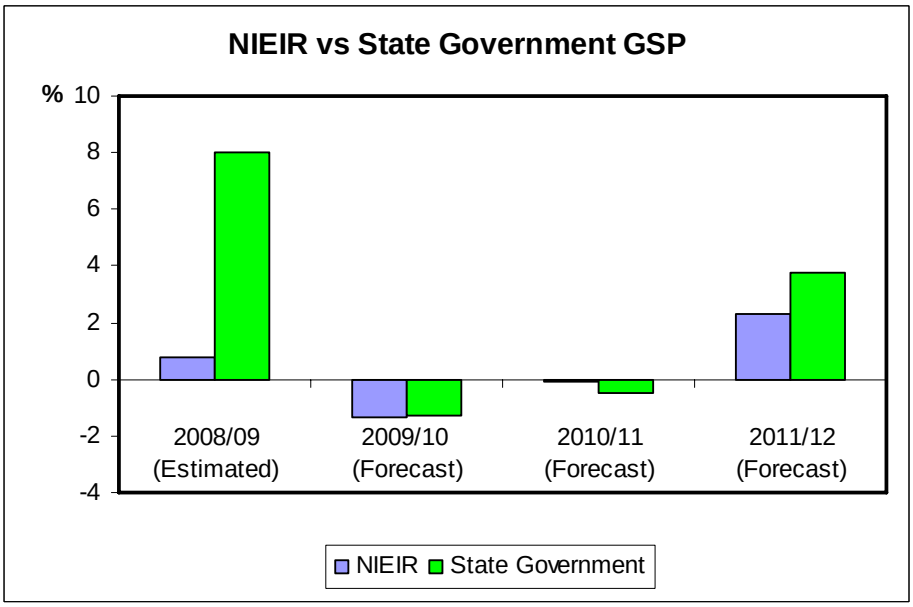


There is a range of outcomes predicted, as might be expected given the present economic uncertainty. NIEIR's forecasts presume a slower recovery than the other forecasts. Also, NIEIR predict a recovery from 2009/10, whereas the ANZ and the independent forecaster have forecast an earlier recovery.

Figure 12 shows that the NIEIR forecasts of Western Australian GSP growth year-on-year for 2009-2012 are in reasonable agreement with those published by the Western Australian Department of Treasury and Finance (DTF) in the May 2009 budget papers, except for the estimated 2008/09 growth, where there is a significant difference of opinion.

The timing and magnitude of recovery will be important for growth in the medium term. DTF, for example, predicts a stronger recovery in 2011/12 than NIEIR; estimating GSP growth of 3.75%, as opposed to the 2.3% predicted by NIEIR. Referring to Figure 10, NIEIR predicts stronger recovery for the following year.

Figure 12 – Comparison of WA Economic Growth Forecasts



3.3 Comparison with NIEIR's Previous Economic Forecasts

Figures 13 and 14 show that NIEIR's 2009 short-term forecasts for GDP and GSP are significantly lower than those published in 2008. *Note that in Figures 13 and 14 the 2008/09 forecast prepared in 2008 is an expected figure based on nine months actual data.*

Figure 13 – Comparison of 2008 and 2009 Australian Economic Growth Forecasts

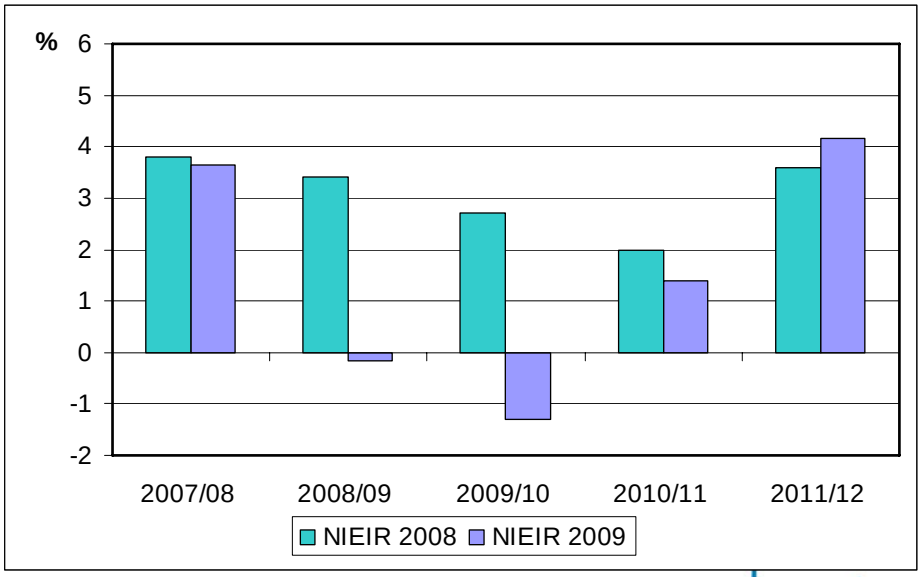
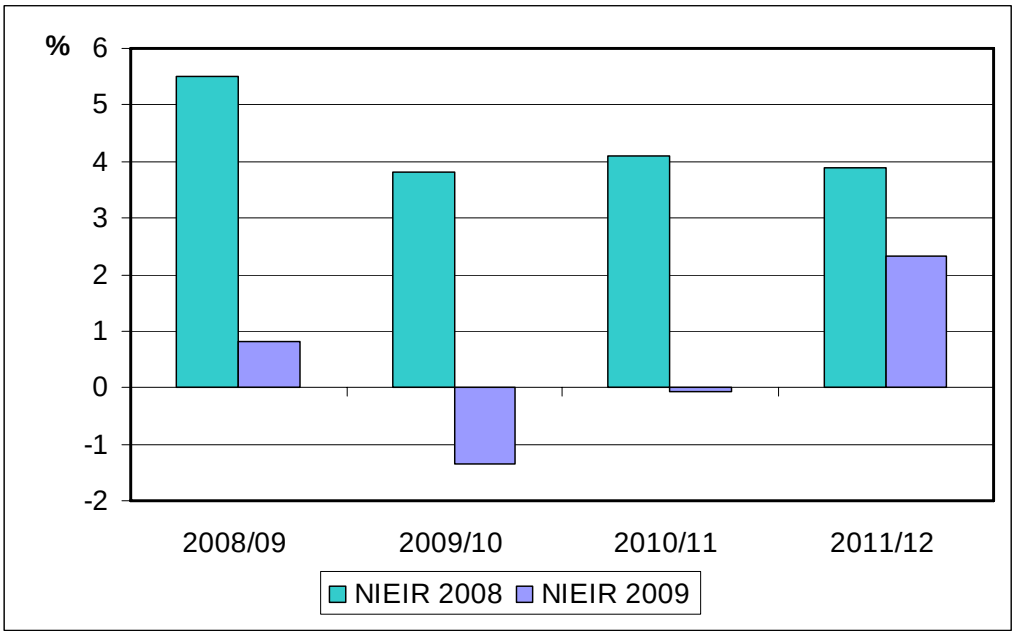


Figure 14 – Comparison of 2008 and 2009 WA Economic Growth Forecasts



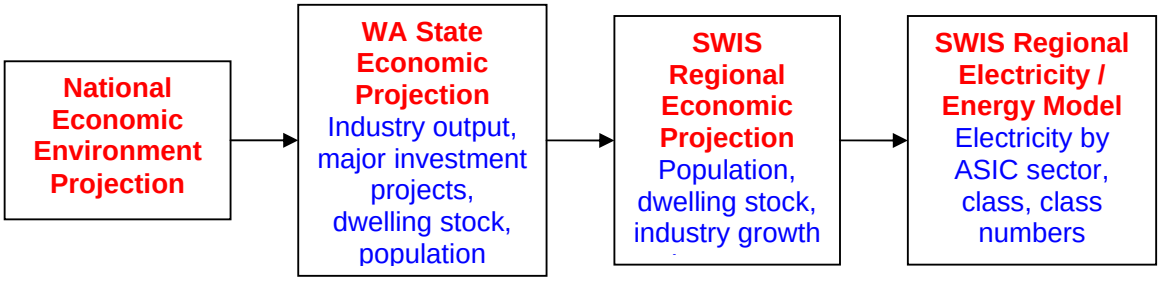
4. Forecasts

4.1 Forecasting Methodology

Most of the forecast preparation for this SOO has been undertaken by the NIEIR on behalf of the IMO. NIEIR prepare forecasts of economic activity, electricity consumption and maximum demand for many of the electricity jurisdictions within Australia. For the SWIS, NIEIR has prepared forecasts for the past six years, initially for Western Power Corporation, and subsequently for the IMO's SOO.

The forecasting process used by NIEIR is comprised of a number of different econometric forecasting modules. Figure 15 shows the relationships between the major components of NIEIR's integrated energy modelling systems.

Figure 15 - NIEIR Energy and Electricity Forecasting Systems



The core tool used by NIEIR is its national econometric model of the Australian economy. This provides projections of national economic growth using inputs from various statistical sources including the Australian Bureau of Statistics and the Australian Taxation Office.

The national economic projections are used as input into a state economic projection model which provides an estimate of Gross State Product and other indicators. The State model is then further disaggregated into the statistical subdivisions that make up the region served by the SWIS.

The economic forecasts of the SWIS include projections of population growth, dwelling stock composition and industry growth by sector. This portion of the forecasting system then links the SWIS regional economic forecast with electricity use based on assumptions about appliance penetration and efficiency, weather conditions and separate forecasts of major industrial loads.

The IMO publishes two sets of forecasts each year within the SOO. These forecasts cover:

- The maximum demand, which is the measure of the highest level of power consumption at any point in time over the year. This is measured in MW.
- Electricity consumption which is the amount of energy sent-out and consumed within the SWIS over a financial year. This is measured in GWh over the full year.

Electricity consumption is driven, to a large extent, by underlying economic-based drivers. Maximum demand, while also partially dependent on economic growth, is highly correlated with ambient temperatures.

Because summer maximum demands are so strongly influenced by the ambient temperature, a number of forecasts are prepared for the IMO. Each group of forecasts is based on three sets of temperature conditions:

- The 10th percentile temperature condition which is expected to be exceeded only once in every ten years. (Termed the 10% Probability of Exceedance or 10% POE).
- The 50th percentile temperature condition which is expected to be exceeded once in every two years. (50% POE).
- The 90th percentile temperature condition which is expected to be exceeded nine times in every ten years. (90% POE).

The 10%, 50% and 90% POE temperature conditions have been determined by analysis of historic weather data. Mean daily temperatures (the arithmetic mean of the daily maximum and daily minimum temperature) for the Perth metropolitan region are the metrics used. Mean daily temperatures of 34.9°C, 31.7°C and 27.1°C correspond to the 10%, 50% and 90% POE temperature conditions respectively.

The expected level of economic activity in the State, and in the SWIS region, also strongly influences the maximum demand and the amount of electricity consumption.

The maximum demand and electricity consumption forecasts used to determine Reserve Capacity Target are based on Expected economic growth conditions. The forecast outcomes associated with Higher or Lower economic growth conditions are provided as a guide to the variability in outcomes that could be expected.

4.2 New Major Loads

The forecast demand going forward is the sum of the NIEIR forecast and new major loads identified by the IMO.

Because of the small number of potential new loads, it is not possible to use a probabilistic approach to forecasting demand in these circumstances. Generally, the IMO considers 20 MW to be minimum threshold for new major block loads.

To assess the size and likelihood that various projects will go ahead, the IMO enters into discussions with developers of these major projects. However, there is always some uncertainty in this assessment relating to:

- decisions associated with the actual development of the proposed mining operations; and
- the timing for the provision of support infrastructure; in particular, new transmission lines and associated facilities.

Block loads associated with magnetite iron ore projects in the Mid-West are the key potential new major loads important to the 2011/12 year, but these loads are dependent on planned new transmission works.

The new northern 330kV transmission line would need to be completed to Eneabba in order to fully supply major proposed mining loads. Questions have been raised as to whether the line can be in place and commissioned for the 2011/12 summer (December - March):

- The line is yet to receive regulatory approval.
- The regulatory approval of this line is tied to the state budgetary process, which may cause further delays even if regulatory approval is granted.

The importance of the new transmission works is further discussed in section 5.5 of this report.

In assessing whether new loads will be in place, the IMO has balanced the need to ensure that sufficient capacity is sought to meet demand, against the importance of avoiding unwarranted cost to the market.

- The network connection risks mentioned above are in addition to any timing risks that might be associated with the resource projects.
- If these loads are presumed to be in place, the market will require the corresponding reserve capacity to be provided. The potential cost of this additional capacity is significant, in the order of $30 million for the 2011/12 year. This cost would need to be recovered from electricity customers.

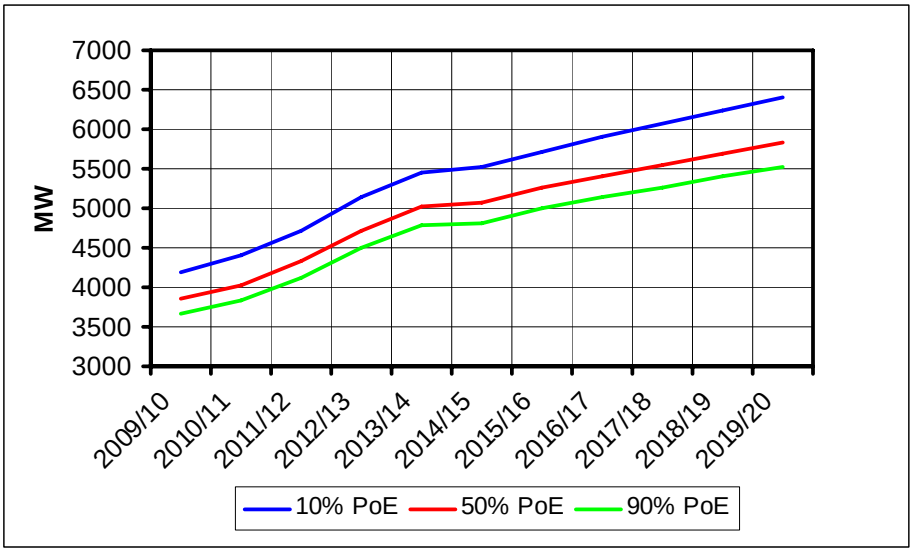
Therefore the IMO has decided that the forecast capacity requirements for 2011/12 should presume no additional new large block loads on the northern transmission system beyond the capacity of the existing network. Some additional load (55 MW) has been allowed for in 2011/12 based on information from Western Power on spare capacity in the existing Mid-West network.

For 2012/13 it has been assumed that the new transmission works are in service and the allowance for major loads has been increased to accommodate major Mid-West mining loads presumed to be in place by that time.

4.3 Maximum Demand Forecast

Figure 16 shows the forecast SWIS maximum demand for each year in the period to 2019/20. This figure shows the maximum demands for the 10%, 50% and 90% POE cases provided by NIEIR. These forecasts are based on expected economic growth conditions and other new major loads identified by the IMO.

Figure 16 - Forecast Maximum Demand - Expected Economic Growth



The maximum demand is forecast to increase at an annual compound growth rate of 4.3% over the ten year period from 2009/10 to 2019/20. In the two years that are the main focus of this report, 2011/12 and 2012/13, the maximum demand is forecast to be 4,725 MW and 5,132 MW respectively. These figures are tabulated in Appendix 2.

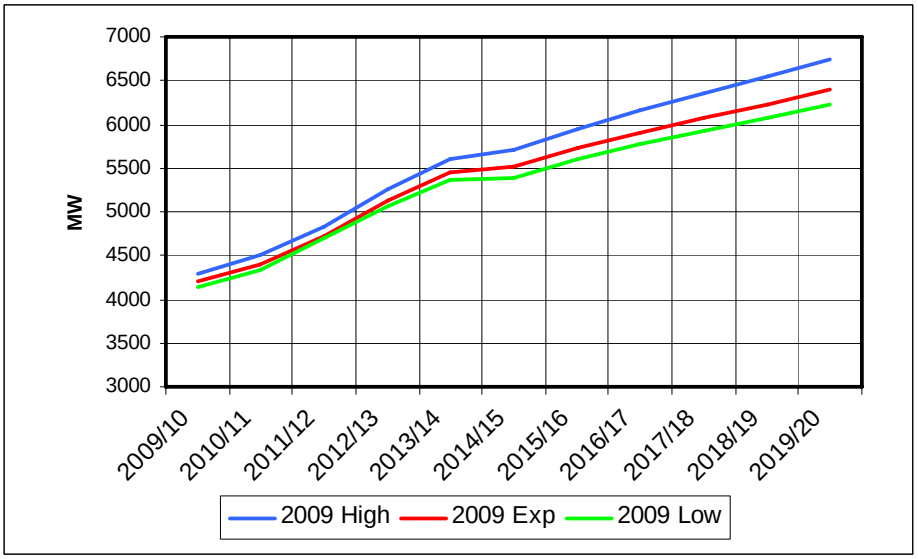
New block loads have a strong impact on the rate of growth. Presently the IMO has allowed for in the forecasts approximately 500 MW of major block loads through to 2014/15. If these loads do not progress, the increase in the maximum demand is forecast to be approximately 3.7% per annum. This is slightly higher than the corresponding 3.3% rate forecast in the 2008 SOO.

Both of NIEIR's 2008 and 2009 economic forecasts have predicted a low point in GSP around 2010. The increase from 3.3% to 3.7% going forward is consistent with the 2009 forecast commencing closer to this lower base point.

The sensitivity of temperature on maximum demand can be seen in the differences between the POE values in Figure 16. For the 2011/12 Reserve Capacity Year, if average (50% POE) temperature conditions are experienced, the maximum demand is forecast to be 8.2% lower (approximately 386 MW) than the 10% POE forecast. Similarly, if the system maximum demand is experienced on a cooler than average day (eg. 90% POE), the maximum demand is forecast to be approximately 12.7% lower (602 MW) than the 10% POE scenario.

The effect of the assumptions about state economic growth (as forecast by GSP), which underpin the maximum demand forecasts, is shown in Figure 17. The 10% POE forecasts for the Expected, High and Low economic growth scenarios are shown.

Figure 17 - Impact of Economic Growth on Maximum Demand for the 10% POE Forecast



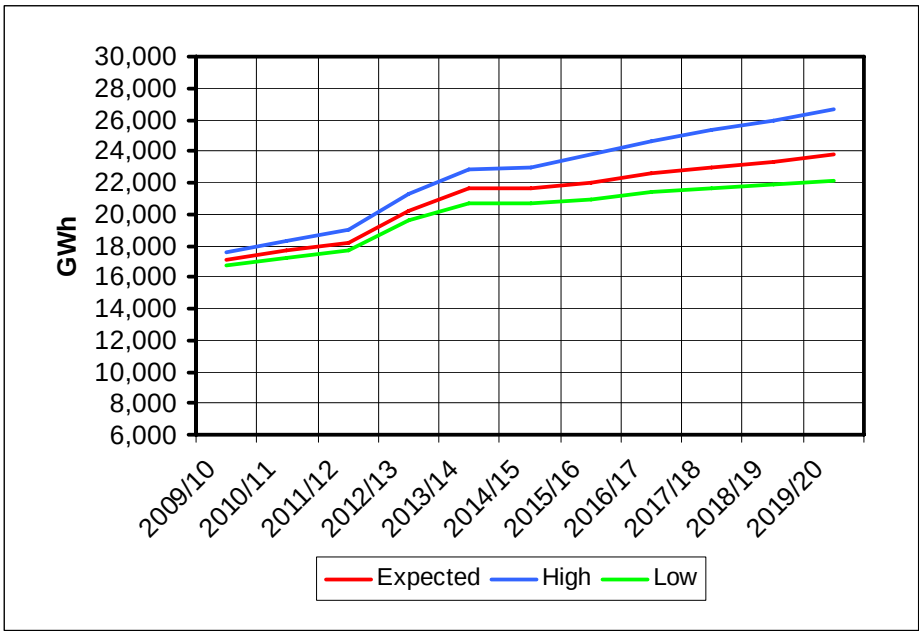
Sensitivity analysis of the economic assumptions on maximum demand shows that if conditions similar to the High economic case are experienced up to 2011/12, the maximum demand is forecast to be approximately 105 MW (~2.2%) higher than for the Expected case. Should economic growth be aligned with the Low scenario, the 10% POE maximum demand forecast would be approximately 30 MW lower.

4.4 Energy Forecast

Figure 18 presents the energy consumption forecasts for the SWIS over the Long Term PASA Study Horizon to 2019/20. Over this period, energy consumption is forecast to grow by approximately 3.3% on average per annum. The impact of new major loads on energy consumption is substantially higher than on peak demand. Without these new major loads, the forecast energy growth would have been 2.1%.

Under the High economic growth scenario, the growth in energy consumption is forecast to be 4.3%, while in the Low economic growth scenario energy consumption is forecast to increase at 2.8% per annum on average.

Figure 18 - Forecast Sent-Out Energy



The expected energy requirements of the SWIS in 2011/12 are forecast to be 18,177 GWh. This is approximately 15% below the 2008 forecast. The principal reason for the change is a delay in the start date of major new loads. The energy forecasts can be found in Appendix 4.

4.5 Differences between the 2008 and 2009 Forecasts

Tabel 2 shows how the maximum demand forecast has changed from that prepared in 2008.

Table 2 – Change from 2008 to 2009 Demand Forecast

Year	2008 10% POE Forecast (MW)	2009 10% POE Forecast (MW)	Change in 10% POE Demand from 2008 to 2009 Forecast (MW)
2009/10	4260	4200	-61
2010/11	4704	4397	-307
2011/12	4860	4725	-134
2012/13	5010	5132	123
2013/14	5192	5452	260
2014/15	5354	5518	164
2015/16	5497	5721	224
2016/17	5631	5903	273
2017/18	5759	6065	306

The new forecast shows some change in maximum demand for the 2009/10 year, 61MW lower than forecast last year. This reflects that the main factors contributing to that demand were in place before the present economic downturn took effect.

For 2010/11 the difference is much larger, down 307 MW. This shows the significant impact of economic downturn combined with delay to the northern transmission line. A number of significant block loads were included in the 2008 forecasts which are not included in the 2009 forecasts.

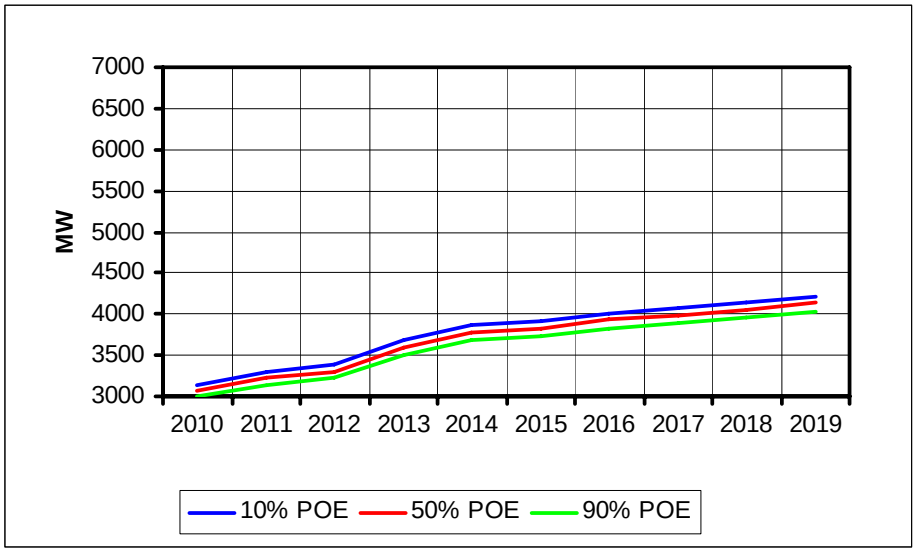
The forecast maximum demand for 2011/12 is 134 MW (~2.8%) below that forecast in 2008.

Forecasts in the outer years of the study period are 150 - 300 MW higher than predicted last year. This is a result of underlying higher demand predicted by NIEIR in the later years and increases in assumptions for block loads associated with mining projects.

4.6 Winter Maximum Demand Forecasts

Figure 19 shows the maximum demands forecast for winter periods during the LTPASA Study Horizon.

Figure 19 – Winter Maximum Demands



Winter peak demand is strongly influenced by the requirement for heating. However, electricity competes directly with gas and other energy sources in this sector so only supplies a portion of total peak demand. Electricity demand for winter heating is substantially lower than the demand for summer cooling, which generally does not have alternative fuel sources.

Because the total demand is lower, the contribution from base industrial and commercial loads during the winter is proportionately higher than in summer. This results in lower temperature variability in winter maximum demand.

Residential and commercial lighting is a significant component of the maximum demand. These, coupled with demand for domestic heating and cooking, mean that the winter peak occurs in the evening, around 6:00 PM.

A number of factors will influence the rate of growth in the winter peak demand including:

- the increased use of reverse cycle air conditioning for domestic heating;
- the decreased use of domestic wood heaters and non-ducted gas heaters; and
- government programs to replace incandescent lights with more energy efficient units.

Currently, the winter peak demand is forecast to grow at an average rate of 3.1% to reach a level of 4,220 MW in 2019. This is 66% of the forecast summer maximum demand.

5. Reserve Capacity Requirements

5.1 Planning Criterion

The IMO is required to set a Reserve Capacity Target for each year at a level which ensures that two elements of the Planning Criterion are met. The first element relates to meeting demand on the day with the highest maximum demand. The second element ensures that adequate levels of energy can be supplied throughout the year.

The Market Rule[3] in respect of the maximum demand criterion requires the Reserve Capacity Target be set so there is sufficient generation and DSM capacity to:

> *"meet the forecast peak demand (including transmission losses and allowing for Intermittent Loads) supplied through the SWIS plus a reserve margin equal to the greater of:*
>
> *i. 8.2% of the forecast peak demand (including transmission losses and allowing for Intermittent Loads); and*
> *ii. the maximum capacity, measured at 41°C, of the largest generating unit;*
>
> *while maintaining the Minimum Frequency Keeping Capacity for normal frequency control. The forecast peak demand should be calculated to a probability level that the forecast would not be expected to be exceeded in more than one year out of ten;"*

The second element of the criterion[4] requires that sufficient capacity be provided to:

> *"limit expected energy shortfalls to 0.002% of annual energy consumption (including transmission losses)".*

The Reserve Capacity Target is set at a level which ensures both elements of the Planning Criterion are met, so the most stringent criterion will be used to determine the Reserve Capacity Target. The Planning Criterion applies to the provision of generation and DSM capability and does not include transmission reliability planning.

The capacity required to meet the first element (peak demand) is shown in Table 3.

In each year of the Long Term PASA Study Horizon, 8.2% of the forecast maximum demand is greater than the capacity of the largest generating unit (measured at 41°C). The 8.2% factor therefore sets the level of reserve margin. The Minimum Frequency Keeping Capacity is determined by Western Power and is set at 60 MW.

[3] Clause 4.5.9(a) of the Wholesale Electricity Market Rules
[4] Clause 4.5.9(b) of the Wholesale Electricity Market Rules

5.2 Role of the Second Element of the Planning Criterion

Although the annual peak demand occurs in summer, the availability of capacity is very important for reliability throughout the year. This is because it is necessary for plant to be regularly taken out of service for maintenance to ensure its ongoing reliability. These plant outages are typically scheduled for lower load periods in autumn, spring and to a lesser extent, in winter. The outage scheduling process is designed to ensure orderly planning of outages so that sufficient capacity is available at all times.

A key role of the second element of the Planning Criterion, relating to energy shortfalls, is to ensure that there is sufficient plant to accommodate this required maintenance throughout the year.

Energy shortfall is tested by modelling the power system in detail across the year. This modelling takes account of the need for plant maintenance and the anticipated level of unplanned (or "forced") outages. The result is an estimate of the percentage of demand that would not be met due to insufficient supply capacity. The criterion is very stringent, requiring that this "energy shortfall" is less than 0.002% of the annual forecast demand.

For a particular peak demand and generation capacity, the level of energy shortfall across the year would be expected to increase with either:

- an increase in load factor (flatter demand); or
- a deterioration in plant availability.

Load factor could reduce with an increase in base load, perhaps through new industrial or mining loads, or higher domestic winter loads, perhaps through a move to reverse cycle air-conditioning rather than gas heating. Increased forced outage rates or planned maintenance would reduce plant availability.

To date, load factors and plant availability have been such that the Reserve Capacity Target has been set by the first element of the Planning Criterion, relating to annual peak demand.

The present trend suggests that peak forecast demand will continue to set the Reserve Capacity Target for the immediate future. This is because the load factor appears to be reducing (with increased summer air-conditioning) and plant availability is improving, as reported in section 2.5.3.

However, ongoing assessment of the level of unserved energy ensures that changes in plant performance or load shape are being monitored so that the appropriate Reserve Capacity Target is set and reliability of supply is maintained.

5.3 Forecast Capacity Requirements

Table 3 – Capacity Required to Cover Peak Demand Criterion

(All figures in MW rounded to nearest integer)

	Maximum Demand	Reserve Margin	Load Following	Intermittent Loads	Total
2009/10	4200	344	60	19	4,623
2010/11	4397	361	60	19	4,836
2011/12	4725	387	60	19	5,191
2012/13	5132	421	60	18	5,632
2013/14	5452	447	60	18	5,978
2014/15	5518	453	60	18	6,049
2015/16	5721	469	60	18	6,268
2016/17	5903	484	60	18	6,465
2017/18	6065	497	60	18	6,640
2018/19	6232	511	60	18	6,820
2019/20	6396	524	60	18	6,999

The second element of the Planning Criterion takes account of the ability of generation facilities to deliver energy throughout the year. The IMO has retained McLennan Magasanik Associates (MMA) to conduct reliability modelling of the SWIS to assess the energy related element of the Planning Criterion and to develop the availability curve.

The Reserve Capacity Requirement for 2011/12 to meet the energy element of the Planning Criterion, as determined by reliability modelling, is less than the requirement determined in accordance with the peak demand element. Under the energy-based analysis, new capacity beyond existing and committed plant would not be required until 2012/13. The figure of 5,191 MW, as shown in Table 3, is therefore the Reserve Capacity Target for the 2009 Reserve Capacity Cycle.

5.4 Availability Curve

The Market Rules include the concept of Availability Classes. This approach recognises the value of DSM, but ensures that the time limitations of DSM are properly considered when assessing system reliability.

Four Availability Classes are defined under the Market Rules:

- Class 1 relating to capacity that is available more than 96 hours every year;
- Class 2 relating to capacity that is available for 72 to 96 hours every year;
- Class 3 relating to capacity that is available for 48 to 72 hours every year; and
- Class 4 relating to capacity that is available for 24 to 48 hours every year.

Class 1 covers generation capacity, while Classes 2 to 4 relate to DSM.

The Availability Curve indicates the maximum amount of DSM that can be introduced into the SWIS before the system is unable to supply all of the energy requirements of users[5].

The Availability Curve does not limit the amount of Capacity Credits assigned to any Availability Class where there is intent to bilaterally trade.

The Availability Curve information for 2011/12 and 2012/13 is shown in Table 4.

Table 4 – Availability Curve

Availability Curve Information	2011/12 (MW)	2012/13 (MW)
Market Rule 4.5.12(a):		
Capacity required for more than 24 Hours	4171	4565
Capacity required for more than 48 Hours	4068	4449
Capacity required for more than 72 Hours	3953	4353
Capacity required for more than 96 Hours	3925	4292
Market Rule 4.5.12(b):		
Minimum Capacity Required to be Provided by Generation Capacity	3870	4260
Market Rule 4.5.12(c):		
Capacity associated with Availability Class 1	3925	4292
Capacity associated with Availability Class 2	29	60
Capacity associated with Availability Class 3	114	97
Capacity associated with Availability Class 4	1123	1183

5.5 Transmission Restrictions on the SWIS

The WEM design is predicated on an unconstrained network. Analysis for the Planning Criterion is based on a consistent assumption of an unconstrained network.

In this model the Reserve Capacity Mechanism does not differentiate generating capacity on the basis of location. Transmission constraints are addressed in other ways.

- Before a new load or generator can connect to the network, it must secure network access. This is provided based on the capacity of the existing network to accommodate the new connection, or subject to the network being upgraded as required.

- Network constraints are taken into account in the forecast for the Reserve Capacity Mechanism. If new loads or generating plant require the completion of new transmission works, then the timing of those works is considered in the assessment process.

[5] This is based on the assumption that the Reserve Capacity Target is just met.

- The Reserve Capacity Mechanism is complemented by a mechanism for Network Control Services (NCS). This can be used to arrange for additional generation to be located to overcome network transfer constraints. The amount and location of any NCS needed is determined by the Network Operator, Western Power, as an alternative to network augmentation. Any required NCS is then procured by the IMO.

Each year, Western Power publishes the Annual Planning Report (APR) to provide advice and guidance on the status of the bulk transmission network and distribution system. The APR presents the results from scenario-based transmission planning activities conducted by Western Power for their long-term planning purposes. The most recent Western Power APR, published in May 2009, can be downloaded from the Western Power website[6].

The transmission system is nearing capacity in several locations. While this is in part due to the strong increase in overall electricity demand, it is also due to the requests for connections for new generators and to accommodate differing energy flows across the system. The changing economics between various fuel types and high levels of interest in renewable energy generation makes it difficult to determine the likely location and size of future power generation projects. Consequently, Western Power is now planning substantial capacity upgrades throughout the transmission system.

The most significant new project is the construction of a double circuit 330 kV transmission line from Pinjar to Moonyoonooka (close to Geraldton), to provide additional capacity in the Mid-West region. This new line will serve a number of planned mineral loads and prospective power generation developments. Funding and regulatory approval for this project is currently being considered by Government.

Western Power has also identified the need for a series of facility upgrades to increase the power transmission capability from the south west of the state to the metropolitan area. This work includes new 330 kV transmission lines, new switchyards and voltage support equipment. Western Power is commencing the regulatory approval process for these works and will subsequently be seeking funding from the State Government.

However, it should be noted that when a Market Participant applies for Certified Reserve Capacity in respect of a generation facility that has not yet entered service; the Market Rules require that facility to provide a letter from the relevant Network Operator indicating:

- that it has made an access offer; and

- that the facility will be entitled to firm access from the nominated service date.

To be certified in the 2009 Reserve Capacity Cycle, a new facility must be capable of fully meeting its reserve capacity obligations by 30 November 2011.

The IMO will be able to consider applications for certification for proposed generators only if Market Participants provide appropriate letters of offer from Western Power[7] advising that firm

[6] http://www.westernpower.com.au/documents/investmentPlanning/2009_ANNUAL_PLANNING_REPORT.pdf

[7] Made in accordance with clause 4.10.1(c)(i) of the Market Rules.

access will be available from a date prior to 30 November 2011. These letters must be provided by the 20 July 2009 closing date for applications for certification.

Based on advice from Western Power, the IMO understands that a final decision on the northern 330kV transmission line will not have been made in time to allow certification for the 2011/12 Capacity Year of any proposed new generators which rely on the new transmission line. It is unlikely that Western Power will be in a position to offer access prior to the closing date.

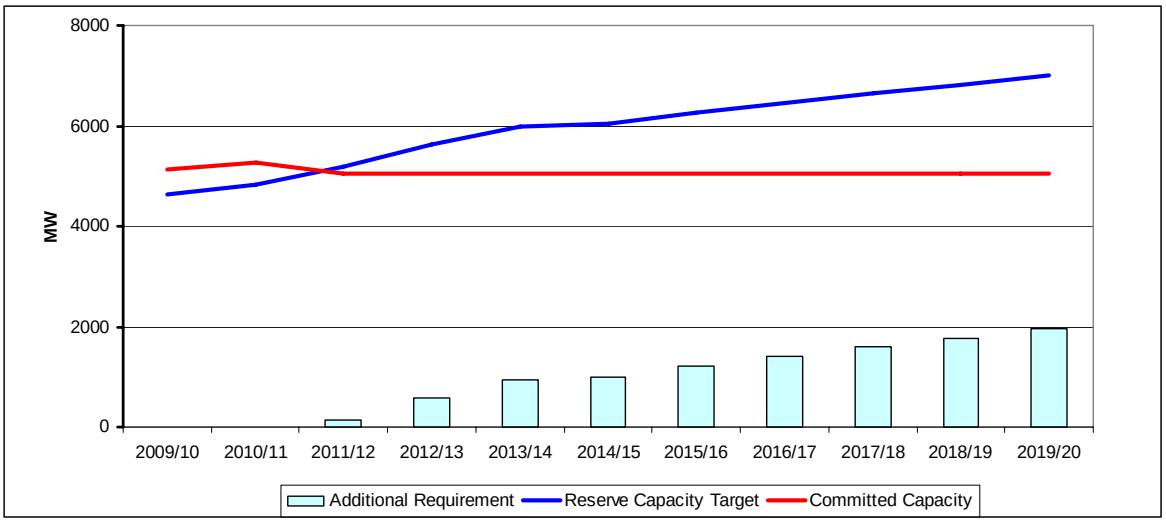
Generation projects reliant on the new transmission works would be able to apply for certification in future years once network access can be secured.

5.6 The Supply-Demand Balance

The supply-demand balance for the period to 2019/20 in the SWIS is presented in Figure 21. In this figure:

- The blue line shows the Reserve Capacity Target, measured on the left hand axis, increasing from 4,623 MW in 2009/10 to 6,999 MW by 2019/20.
- The red line shows the level of generation which is in place or under construction and DSM capacity rising through to 2010/11. This represents the commitment to new facilities made in the 2008 Reserve Capacity Cycle. At the end of 2010/11 Kwinana Stage A is scheduled to be decommissioned which accounts for the reduction in capacity available thereafter.
- The blue bars, which are measured on the right hand axis, show the cumulative requirement for additional capacity to meet the Reserve Capacity Target over the next ten years.

Figure 21 - Required Generation and DSM Capacity



Key points to note from Figure 21 are:

- Sufficient Capacity Credits have been procured to meet the Reserve Capacity Requirement during 2009/10 and 2010/11.

- Additional Capacity Credits of 145 MW will be needed to meet the Reserve Capacity Target in 2011/12 will be required as a result of the decommissioning of Kwinana A in 2011 (240MW).

- A further 1807 MW of Capacity Credits will be needed to meet the Reserve Capacity Target from 2011/12 to 2019/20.

This figure illustrates the substantial opportunity for investment in generation and DSM capacity in Western Australia. Approximately 2,000 MW of new capacity will be required over the coming decade to meet load growth. This represents an excellent opportunity for new and existing investors in the WEM.

Circumstances may change over the period through to 2019/20. Project proponents, investors and developers are advised to make independent assessments of the possible supply and demand conditions.

Graphs of the supply demand balance for High and Low economic forecasts are provided in Appendix 5.

5.7 Treatment of Future Demand Side Management

In constructing Figure 20 and those in Appendix 5, it has been assumed that the level of DSM anticipated for 2010/11, 153MW, continues into the future.

5.8 Opportunity for Investment

A total of 5,191 MW and 5,632 MW of generation and DSM capacity must be available to meet the Reserve Capacity Requirements in 2011/12 and 2012/13 respectively.

This means that 145 MW of new capacity, in addition to that already in place, or under construction, must be secured to meet the requirements for 2011/12. The requirement grows to 585 MW by 2012/13 - a further 440 MW on the 2011/12 requirement. This is summarised in Table 5.

Table 5 – Opportunity for Investment

	2011/12	2012/13
Existing Generation	4442 MW	4230 MW
Existing DSM	153 MW	153 MW
New Generation and DSM under Construction for 2010/11	663 MW	663 MW
Plant Closures	-212 MW	0 MW
Reserve Capacity Requirement	5191 MW	5632 MW
Additional Capacity Required (cumulative)	145 MW	585 MW

The most recent Expressions of Interest process identified proposals for 1279 MW (nameplate) of new capacity for 2011/12 Capacity Year. It should be noted, however, that the proponents of these developments have not necessarily indicated any level of commitment to proceed.

The IMO has assessed the likelihood of these developments proceeding based on its understanding of the status of relevant network access and environmental approvals. With this assessment and allowing for likely Capacity Credit levels (particularly for wind generators) potential developments represent 642 MW of Capacity Credits.

The IMO has not assessed the probability of each of the potential projects. As with any competitive market, the probability of a proposed project is partly determined by the success of competing projects. Accordingly, for the purposes of this report, the IMO has not determined that any of the potential projects are "probable".

The opportunity for new investment is illustrated in Figures 22 and 23. In these figures "Proposed Projects" relates to the 642 MW of planned projects identified as "potential".

Figure 22 – Opportunity for Investment – 2011/12

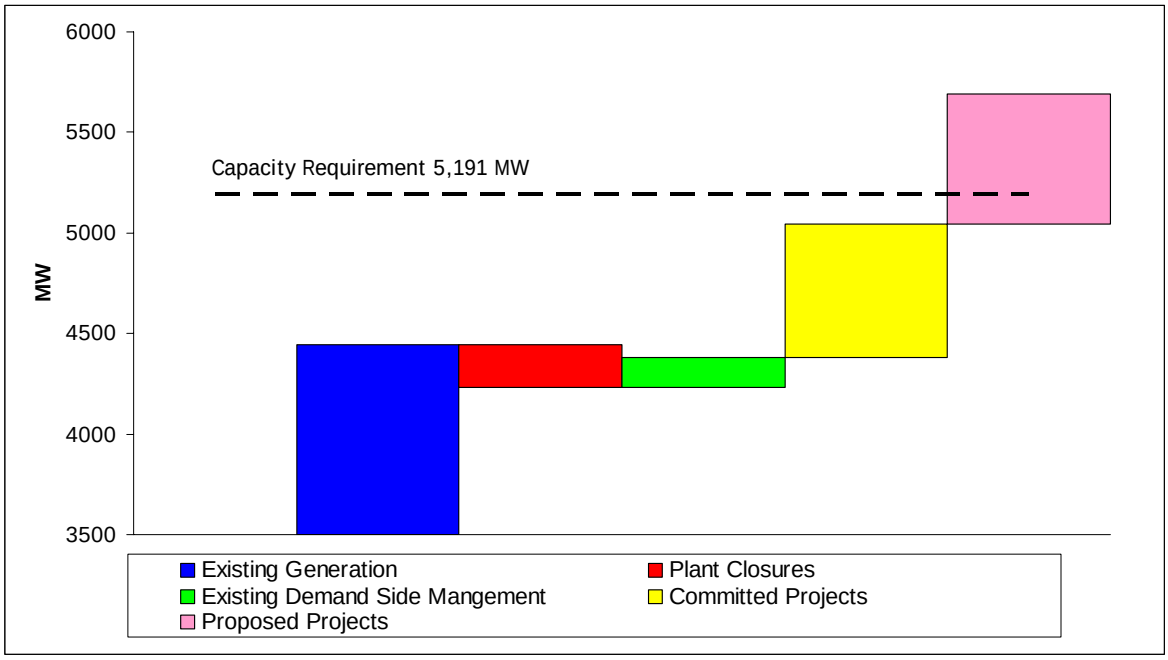
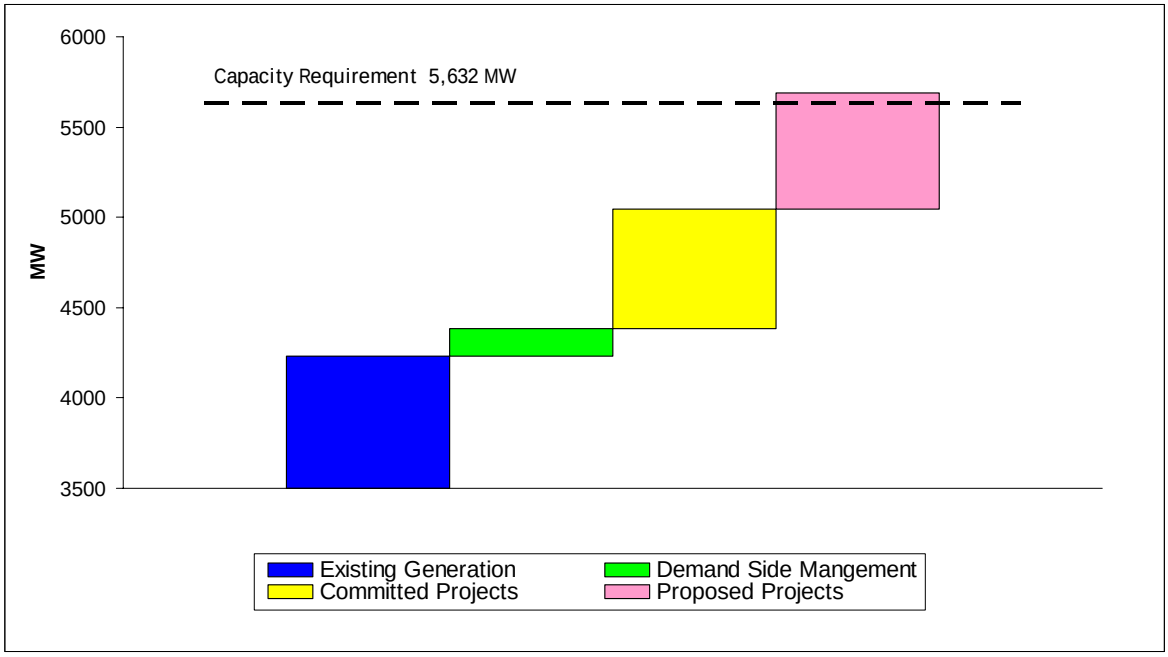


Figure 23 – Opportunities for Investment – 2012/13



6. Next Steps in the Reserve Capacity Process

The next stage in the Reserve Capacity process is for Market Participants to apply for Certified Reserve Capacity and then apply to be assigned Capacity Credits. Certification and Capacity Credits apply only to one year, so new applications must be made each year for all existing or planned generation and DSM facilities.

The timetable for the process is:

- Applications for Certification of Reserve Capacity are now open and must be provided to the IMO by 5:00 PM WST on Monday, 20 July 2009.
- Market Participants with facilities which are granted Certified Reserve Capacity must then apply for Capacity Credits, indicating whether they intend to trade capacity bilaterally or whether they wish to offer the Certified Reserve Capacity into a Reserve Capacity Auction (if one is required). This process must be completed by 5:00 PM on Monday, 10 August 2009.
- On Tuesday 11 August 2009, the IMO will advise Market Participants who have indicated their intention to trade their capacity bilaterally how many Capacity Credits have been assigned to their Facilities.
- By 5:00 PM on Tuesday 18 August 2009, the IMO will advise whether sufficient capacity has been secured through bilateral trades. If the Reserve Capacity Requirement has been met, no Reserve Capacity Auction will be held. If sufficient capacity has not been secured through bilateral trades, the IMO will also advise that it will run a Reserve Capacity Auction to secure the outstanding quantity.
- If a Reserve Capacity Auction is required, Market Participants must provide their offers between Thursday 20 August and Friday 28 August 2009. The IMO would run the Reserve Capacity Auction on Tuesday 1 September 2009.

Prospective developers should note that for a facility to receive Certified Reserve Capacity, it must fully meet the requirements of Market Rule 4.10.1(c) in respect to network access and environmental approvals. Both of these processes can take a considerable time and potential developers are encouraged to contact Western Power and the Department of Environment at the earliest opportunity.

Disruptions to gas supply in 2008 have focused attention on ensuring that appropriate fuel supply arrangements are in place for all facilities. In seeking certification for generation facilities, Market Participants must provide full details of their fuel supply and transport contract arrangements with appropriate supporting documentation. The IMO acknowledges that fuel supply arrangements are often complex and may comprise a portfolio of supply and transport arrangements. Market Participants should develop a presentation that will address potential questions and assist the IMO in undertaking the certification assessment within the short timeframe provided.

Further information on the certification[8] and bilateral trade declaration, and the Reserve Capacity Auction[9] process, is available on the IMO website.

[8] http://www.imowa.com.au/Attachments/MarketProcedures/ProcedureChange_2008_05.htm

7. Key Issues for Potential Developers

7.1 Potential Change to Certification of Intermittent Generators

Developers are considering proposals for significant levels of new wind farm capacity. The Federal and State Governments have announced mechanisms designed to increase the proportion of energy produced by renewable generation. It is anticipated that there may be substantial increases in the amount of wind capacity proposed for service in the SWIS.

The intermittent nature of wind farms has several significant impacts on the power system in respect to generation requirements. In particular:

- their output may be very low during times of system maximum demand;
- their output may be high during periods of low system demand forcing the output from other generators to be reduced; and
- the variability of their output may cause excessive frequency fluctuations on the power system.

The Market Advisory Committee (MAC) has convened a Renewable Energy Generation Working Group. This Working Group has been requested to:

- identify priority issues arising, or that could arise, from increasing penetration of intermittent renewable energy generation in the South West Interconnected System;
- determine the appropriate framework for analysis of issues and options for resolving them against the Market Objectives; and
- submit its assessment, analysis and conclusions in a report to the Market Advisory Committee (MAC).

Parties considering development of wind farms, and other intermittent generation options, should be aware of this review and that proposals for changes to the Market Rules may be put forward for stakeholder consultation.

7.2 Changes for Demand Side Management

Demand Side Management (DSM) is voluntary reduction or curtailment of demand, usually in response to external factors. DSM is an integral a part of the WEM and can be assigned Capacity Credits.

Experience gained since commencement of the market has identified a number of operational issues with DSM. Consequently, a DSM Working Group was established in December 2007 to determine a set of terms and conditions under which DSM can be certified. This work led to changes to the Market Rules in late 2008.

[9] http://www.imowa.com.au/Attachments/MarketProcedures/ProcedureChange_2008_04.htm

Market Participants considering offering DSM into the WEM are encouraged to ensure they are familiar with these changes.

7.3 Early Certification of Reserve Capacity

For new generation facilities, the IMO proposes to extend the timeframes for Certification of Reserve Capacity and assignment of Capacity Credits. This will allow projects with long lead times to secure Capacity Credits earlier and provide greater certainty for investors.

Since longer lead times are mostly relevant for new plant, the IMO proposes that the new timeframe apply only to new generation facilities. It will not apply to upgrades to generation facilities or to Demand Side Programmes.

This matter is being dealt with under Rule Change Proposal: RC_2009_10. Further details can be found on the IMO's website[10].

7.4 Changing the Window of Entry into the Reserve Capacity Market

Currently the timeframe for new capacity to enter the Reserve Capacity market is a four-month window from 1 August to and 30 November.

The IMO considers that the current dates for entry of new capacity may encourage risk taking. For example, a developer may take an optimistic view and bring a project forward in order to meet the 30 November deadline.

In response to these considerations, the IMO has proposed to retain the four month window of entry for new entrant generators, but to bring the window forward to start on 1 June, with all capacity to be fully available no later than 1 October each year.

This is expected to have a net benefit to the market by minimising the risk associated with bringing new capacity into service. The proposed change is planned to take effect in 2010.

This matter is being dealt with under Rule Change Proposal: RC_2009_11. Further details can be found on the IMO's website[11].

[10] http://www.imowa.com.au/Attachments/RuleChange/RuleChange_2009_10.html

[11] http://www.imowa.com.au/Attachments/RuleChange/RuleChange_2009_11.html

Appendix 1 – Forecasts of Economic Growth

Growth in Australian Gross Domestic Product
(% Year on year growth)

	Expected	High	Low
2009/10	-1.3	0.0	-3.2
2010/11	1.4	2.8	0.4
2011/12	4.2	4.7	3.5
2012/13	5.2	5.5	2.7
2013/14	3.0	4.2	1.5
2014/15	0.6	2.0	-0.2
2015/16	0.5	1.9	0.5
2016/17	2.5	3.7	2.8
2017/18	2.7	3.8	2.7
2018/19	3.5	4.2	3.0

Growth in Western Australian Gross State Product
(% Year on year growth)

	Expected	High	Low
2009/10	-1.4	1.0	-3.3
2010/11	-0.1	1.2	-1.6
2011/12	2.3	3.2	1.3
2012/13	8.2	9.1	5.3
2013/14	7.7	8.2	4.7
2014/15	3.0	4.5	2.2
2015/16	2.9	4.5	2.3
2016/17	3.8	5.7	3.8
2017/18	3.5	4.8	3.1
2018/19	4.6	5.6	3.7

Appendix 2 – Forecasts of Summer Maximum Demand

Summer Maximum Demand Forecasts with Expected Economic Growth (MW)

	10% POE	50% POE	90% POE
2009/10	4,200	3,859	3,668
2010/11	4,397	4,035	3,832
2011/12	4,725	4,339	4,123
2012/13	5,132	4,722	4,493
2013/14	5,452	5,019	4,776
2014/15	5,518	5,066	4,813
2015/16	5,721	5,251	4,988
2016/17	5,903	5,413	5,138
2017/18	6,065	5,554	5,268
2018/19	6,232	5,700	5,403
2019/20	6,396	5,845	5,536

Summer Maximum Demand Forecasts with High Economic Growth (MW)

	10% POE	50% POE	90% POE
2009/10	4,283	3,939	3,747
2010/11	4,512	4,146	3,941
2011/12	4,830	4,438	4,219
2012/13	5,263	4,845	4,612
2013/14	5,605	5,162	4,914
2014/15	5,718	5,255	4,995
2015/16	5,940	5,458	5,188
2016/17	6,159	5,655	5,372
2017/18	6,353	5,826	5,531
2018/19	6,552	6,003	5,696
2019/20	6,749	6,178	5,858

Summer Maximum Demand Forecasts with Low Economic Growth (MW)

	10% POE	50% POE	90% POE
2009/10	4,148	3,810	3,621
2010/11	4,328	3,969	3,769
2011/12	4,695	4,313	4,100
2012/13	5,075	4,671	4,444
2013/14	5,365	4,938	4,698
2014/15	5,381	4,937	4,688
2015/16	5,608	5,147	4,888
2016/17	5,782	5,300	5,030
2017/18	5,931	5,429	5,149
2018/19	6,081	5,560	5,268
2019/20	6,229	5,688	5,385

Appendix 3 – Forecasts of Winter Maximum Demand

Winter Maximum Demand Forecasts with Expected Economic Growth (MW)

	10% POE	50% POE	90% POE
2009	3,095	3,029	2,946
2010	3,146	3,078	2,994
2011	3,293	3,223	3,136
2012	3,378	3,305	3,217
2013	3,676	3,601	3,510
2014	3,861	3,784	3,692
2015	3,912	3,834	3,740
2016	4,009	3,928	3,832
2017	4,071	3,988	3,890
2018	4,148	4,063	3,963
2019	4,220	4,133	4,031

Winter Maximum Demand Forecasts with High Economic Growth (MW)

	10% POE	50% POE	90% POE
2009	3,154	3,086	3,004
2010	3,245	3,176	3,090
2011	3,446	3,373	3,285
2012	3,584	3,508	3,417
2013	3,928	3,849	3,755
2014	4,158	4,076	3,979
2015	4,283	4,198	4,098
2016	4,459	4,370	4,267
2017	4,591	4,498	4,393
2018	4,739	4,643	4,534
2019	4,882	4,783	4,671

Winter Maximum Demand Forecasts with Low Economic Growth (MW)

	10% POE	50% POE	90% POE
2009	3,055	2,998	2,911
2010	3,084	3,027	2,938
2011	3,208	3,150	3,059
2012	3,240	3,180	3,089
2013	3,479	3,417	3,325
2014	3,652	3,589	3,494
2015	3,675	3,611	3,515
2016	3,745	3,679	3,582
2017	3,775	3,709	3,610
2018	3,814	3,746	3,646
2019	3,844	3,775	3,674

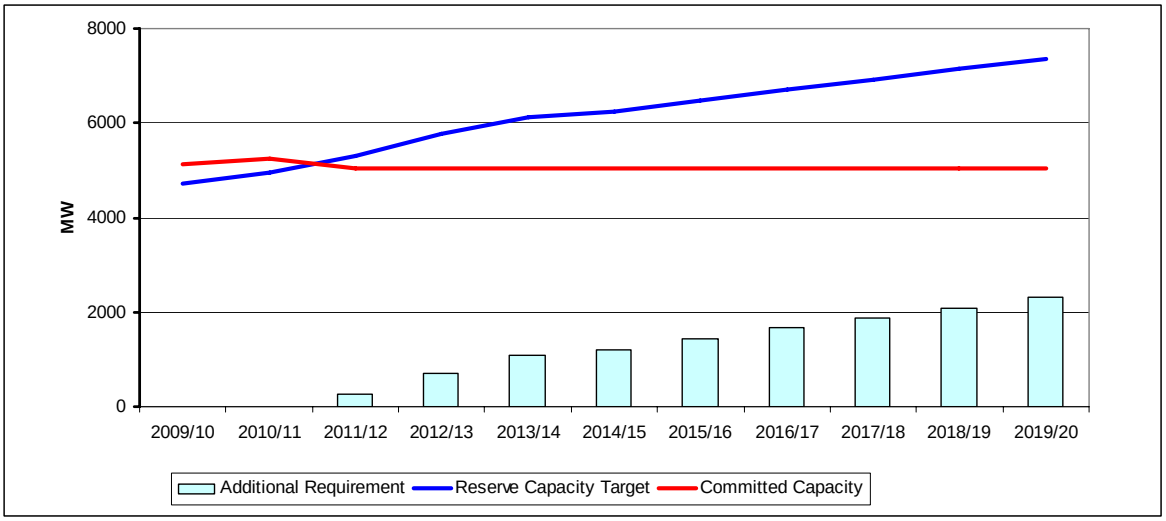
Appendix 4 – Forecasts of Energy Sent-Out

Forecasts of Energy Sent-Out for the SWIS (GWh)

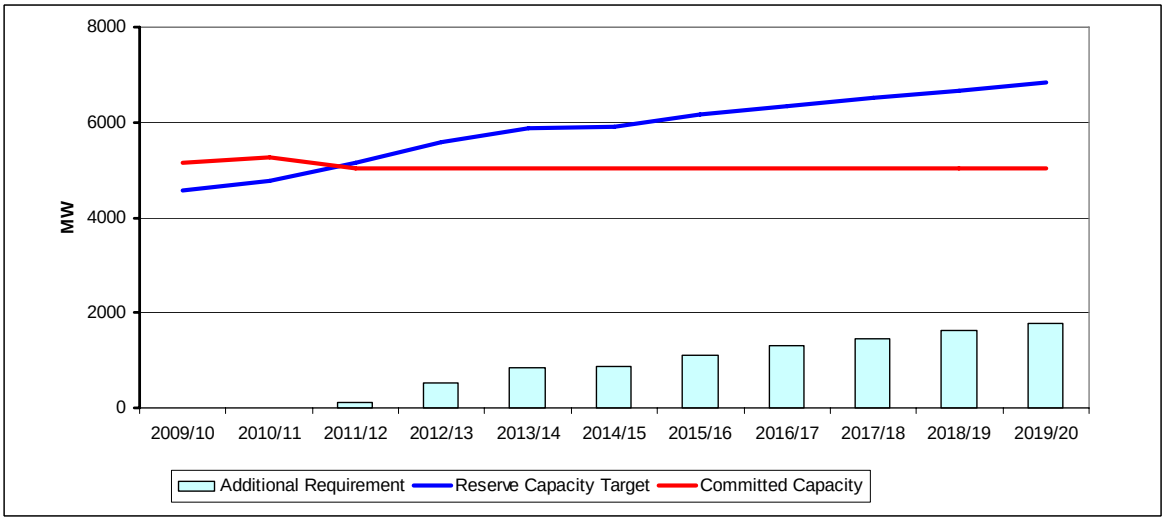
	Expected	High	Low
2009/10	17,145	17,537	16,795
2010/11	17,726	18,324	17,275
2011/12	18,177	19,062	17,759
2012/13	20,206	21,278	19,553
2013/14	21,600	22,816	20,679
2014/15	21,648	22,995	20,628
2015/16	22,055	23,792	20,954
2016/17	22,607	24,672	21,429
2017/18	22,955	25,285	21,673
2018/19	23,364	25,961	21,940
2019/20	23,747	26,610	22,159

Appendix 5 – Supply Demand Balance for High and Low Economic Forecasts

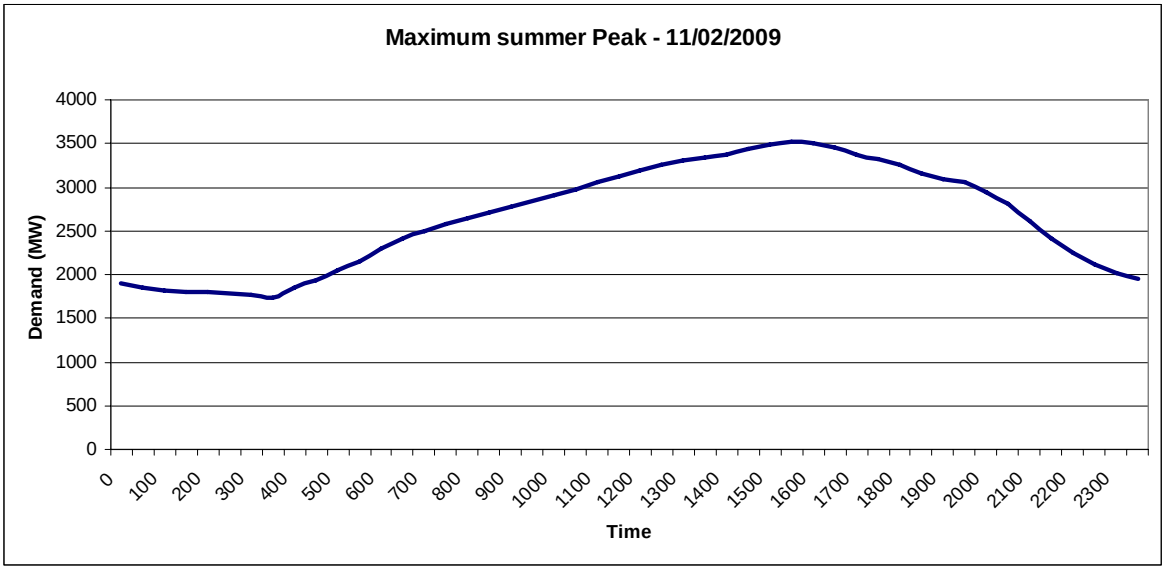
Required Generation and DSM Capacity in High Economic Growth Scenario

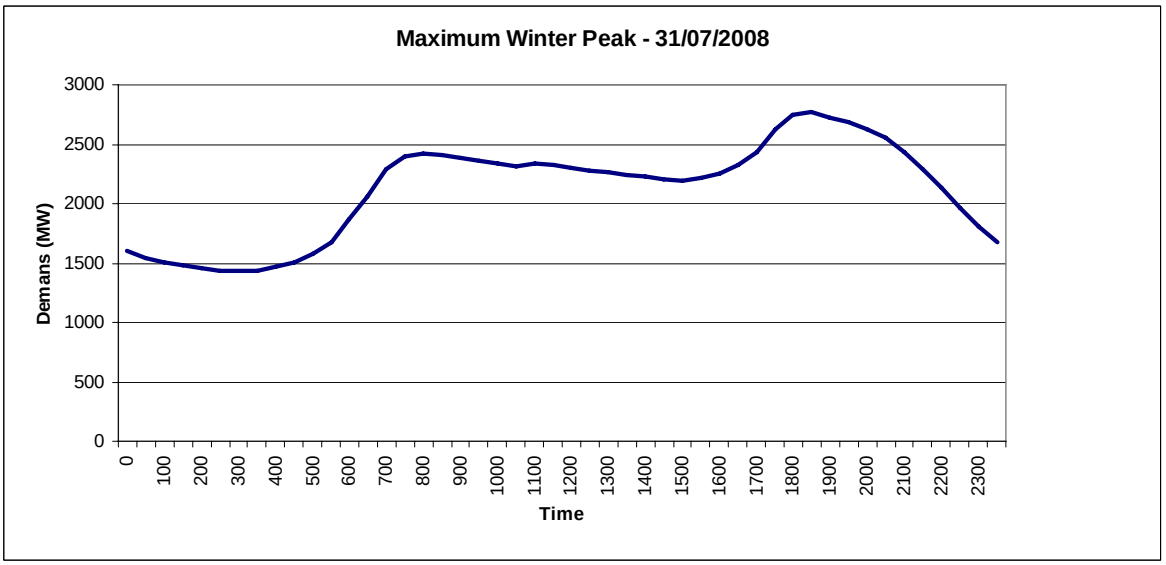


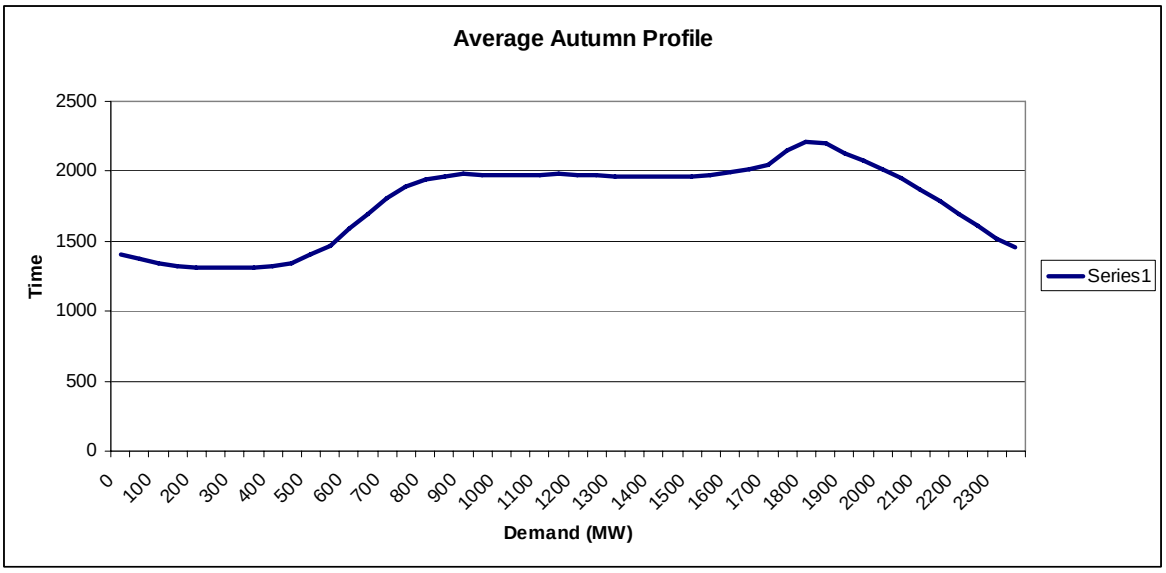
Required Generation and DSM Capacity in Low Economic Growth Scenario

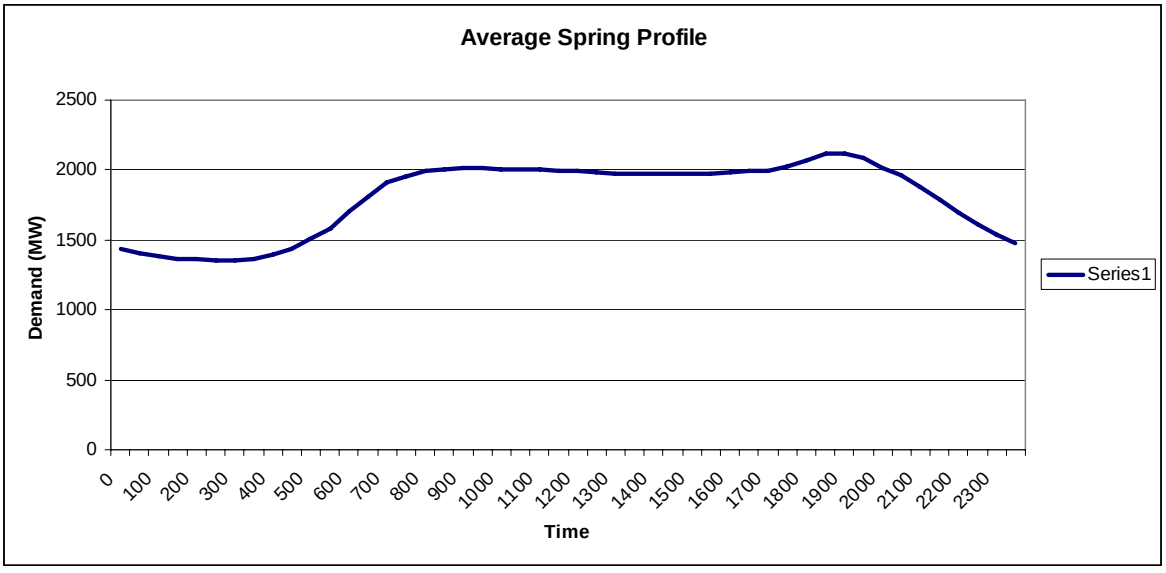


Appendix 6 – Typical Daily Load Curves






Average Autumn Profile
2500
2000
1500
1000
500
0
Time
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
Demand (MW)
Series1


Average Spring Profile
2500
2000
1500
1000
500
0
Demand (MW)
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300
Time
Series1

Appendix 7 – Facility Capacities

Registered Generation Facilities - Existing and Committed

Participant Name	Facility Name	Nameplate Capacity
Alcoa of Australia	ALCOA_KWI	5
Alcoa of Australia	ALCOA_PNJ	10
Alcoa of Australia	ALCOA_WGP	25
Alinta Sales Pty Ltd	ALINTA_PNJ_U1	142
Alinta Sales Pty Ltd	ALINTA_PNJ_U2	142
Alinta Sales Pty Ltd	ALINTA_WGP_GT	190
Alinta Sales Pty Ltd	ALINTA_WGP_GT2	190
Alinta Sales Pty Ltd	ALINTA_WWF	89.1
EDWF Manager Pty Ltd	EDWFMAN_WF1	80
Griffin Power Pty Ltd	BW1_BLUEWATERS_G2	229
Griffin Power 2 Pty Ltd	BW2_BLUEWATERS_G1	229
Goldfields Power Pty Ltd	PRK_AG	68
Landfill Gas And Power Pty Ltd	CANNING_MELVILLE	3
Landfill Gas And Power Pty Ltd	KALAMUNDA_SG	1.3
Landfill Gas And Power Pty Ltd	RED_HILL	2.5
Landfill Gas And Power Pty Ltd	TAMALA_PARK	4.5
Mount Herron Engineering Pty Ltd	MHPS	1.416
NewGen Neerabup Partnership	NEWGEN_NEERABUP_GT1	330
NewGen Power Kwinana Pty Ltd	NEWGEN_KWINANA_CCG1	320
Perth Energy Pty Ltd	ATLAS	1.123
Perth Energy Pty Ltd	GOSNELLS	1.048
Western Energy Pty Ltd	PERTHENERGY_KWINANA_GT1	120
Perth Energy Pty Ltd	ROCKINGHAM	2.096
Perth Energy Pty Ltd	SOUTH_CARDUP	3.369
Perth Power Partners	PPP_KCP_EG1	116
SkyFarming Pty Ltd	SKYFRM_MTBARKER_WF1	2.1
Southern Cross Energy	STHRNCRS_EG	23
Verve Energy	ALBANY_WF1	21.6
Verve Energy	BREMER_BAY_WF1	0.66
Verve Energy	COCKBURN_CCG1	240.8
Verve Energy	COLLIE_G1	330
Verve Energy	GERALDTON_GT1	21
Verve Energy	KALBARRI_WF1	1.6
Verve Energy	KEMERTON_GT11	156

Participant Name	Facility Name	Nameplate Capacity
Verve Energy	KEMERTON_GT12	156
Verve Energy	KWINANA_G1	120
Verve Energy	KWINANA_G2	120
Verve Energy	KWINANA_G5	200
Verve Energy	KWINANA_G6	200
Verve Energy	KWINANA_GT1	20.87
Verve Energy	MUJA_G5	200
Verve Energy	MUJA_G6	200
Verve Energy	MUJA_G7	200
Verve Energy	MUJA_G8	200
Verve Energy	MUNGARRA_GT1	37.4
Verve Energy	MUNGARRA_GT2	37.4
Verve Energy	MUNGARRA_GT3	38.34
Verve Energy	PINJAR_GT1	37.4
Verve Energy	PINJAR_GT10	116.4
Verve Energy	PINJAR_GT11	123.4
Verve Energy	PINJAR_GT2	37.4
Verve Energy	PINJAR_GT3	38.34
Verve Energy	PINJAR_GT4	38.34
Verve Energy	PINJAR_GT5	38.34
Verve Energy	PINJAR_GT7	38.34
Verve Energy	PINJAR_GT9	116.4
Verve Energy	SWCJV_WORSLEY_COGEN_COG1	123
Verve Energy	TIWEST_COG1	38.1
Verve Energy	WEST_KALGOORLIE_GT2	38.4
Verve Energy	WEST_KALGOORLIE_GT3	24.8
Waste Gas Resources Pty Ltd	HENDERSON_RENEWABLE_IG1	2.13
Waste Gas Resources Pty Ltd	HENDERSON_RENEWABLE_IG2	1.065
Western Australia Biomass Pty Ltd	BRIDGETOWN_BIOMASS_PLANT	44

Appendix 8 – Abbreviations

APR - Transmission and Distribution Annual Planning Report (published by Western Power)

DSM - Demand Side Management

DTF - Western Australian Department of Treasury and Finance

GDP – Gross Domestic Product (for Australia)

GSP – Gross State Product (for Western Australia)

GWh – Gigawatt-hour

IMO – Independent Market Operator

kV – kilovolt

LT PASA – Long Term Projected Assessment of System Adequacy

MAC – Market Advisory Committee

MW – Megawatt

NIEIR – National Institute of Economic and Industry Research

POE – Probability of Exceedance

RCM – Reserve Capacity Mechanism

SOO – Statement of Opportunity Report

SWIS – South West Interconnected System

WEM – Wholesale Electricity Market