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OMAN POWER AND WATER PROCUREMENT CO. (SAOC)

OPWP's 7-YEAR STATEMENT

(2012 – 2018)

APPROVED BY THE AUTHORITY FOR ELECTRICITY REGULATION, OMAN

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GLOSSARY

AER	Authority for Electricity Regulation, Oman
BTU/scf	British thermal units per standard cubic foot
CCGT	Combined-cycle gas turbine
DGW	Directorate General of Water (in the Office of the Minister of State and Governor of Dhofar)
DPC	Dhofar Power Company (SAOC)
GJ	Gigajoule(s)
GPDC	Al Ghubrah Power and Desalination Company (SAOC)
HHV	Higher Heating Value
IPP	Independent power project
IWP	Independent water project
IWPP	Independent water and power project
kWh	Kilowatt hour(s)
LOLH	Loss of load hours
m^3	Cubic metre(s)
m^3/d	Cubic metres per day
MEDC	Muscat Electricity Distribution Company (SAOC)
MIGD	Million imperial gallons per day
MIS	Main Interconnected System
MISC	Majis Industrial Services Company (SAOC)
MJEC	Majan Electricity Company (SAOC)
MOG	Ministry of Oil and Gas
MSF	Multi-stage flash (desalination technology)
MW	Megawatt(s)
MZEC	Mazoon Electricity Company (SAOC)
OCGT	Open-cycle gas turbine
OETC	Oman Electricity Transmission Company (SAOC)
OPWP	Oman Power and Water Procurement Company (SAOC)
PAEW	Public Authority for Electricity and Water
PDO	Petroleum Development Oman (LLC)
PPA	Power purchase agreement
PWPA	Power and water purchase agreement
RAEC	Rural Areas Electricity Company (SAOC)
RO	Reverse osmosis (desalination technology)
Sm^3	Standard cubic metre(s)
Sm^3/d	Standard cubic metres per day
TWh	Terawatt hour(s) = billion (10^9) kWh

OVERVIEW

This Statement provides a 7-year outlook for power and desalinated water supply in the two main systems of Oman – the Main Interconnected System (MIS) and the Salalah System. OPWP prepares the 7-Year Statement annually in accordance with Condition 5 of its license. This is Issue 6, for the period 2012 to 2018; previous issues and additional information are available on the OPWP website at www.omanpwp.com.

Demand for Electricity

In the MIS, peak demand is expected to grow at 8% per year, from 3845 MW in 2011 to 6582 MW in 2018. Two additional demand scenarios are considered: the "low case" projects 6% annual growth, resulting in peak demand of 5,791 MW in 2018, nearly 800 MW below the "expected case"; the "high case" projects 11% annual growth and peak demand at 8,059 MW in 2018, exceeding the "expected case" by more than 1,450 MW.

In Salalah, peak demand is expected to grow at 10% per year, from 348 MW in 2011 to 689 MW in 2018. The "low case" considers sustained lower growth at 7%, reaching 571 MW by 2018, nearly 120 MW below the "expected case". The "high case" considers more rapid industrialization, with peak demand increasing at 17% per year to 1041 MW in 2018, exceeding the "expected case" by more than 350 MW.

Power Generation Requirements

In the MIS, the major expected developments through 2018 include: (1) construction of the Barka Phase III, Sohar Phase II, and Sur plants, providing 3490 MW; (2) procurement of about 200 MW of solar power, subject to final Government approval; and (3) expiration of contracts at existing plants summing to 1432 MW.

OPWP projects capacity requirements of 6,780 MW by 2018, which could be met by extending the PPAs due to expire, although other options will also be considered. If the "high case" demand scenario transpires, a major new generation plant would be required by 2017.

In Salalah, the principal developments include the completion of the Salalah IWPP plant in 2012, and the planned addition of a second I(W)PP by 2016. If the "high case" demand scenario transpires, then temporary generation may be required in 2015, and a third plant may be required in 2018.

Desalinated Water Requirements

Aggregate water demand excluding Salalah is projected to increase by 5% per year, from 196 million m^3 in 2011 to 269 million m^3 in 2018. The principal developments include: (1) addition of the Ghubrah IWP (191,000 m^3/d) in 2014; (2) addition by MISC of a desalination plant that will meet its water supply needs from 2013 onwards; (3) potential capacity addition of 45,000 m^3/d (10 MIGD) at Barka I; and (4) expiration of PWPAs at Barka I and remaining units at the Ghubrah desalination plant in 2018.

PAEW has requested OPWP to procure an additional 405,000 m^3/d (89 MIGD) by 2018 for the Interconnected Zone, proposed as two new desalination plants at Qurayyat and Suwayq. OPWP must consider also the contract extension or replacement of capacity at Ghubrah and Barka I at this time (234,000 m^3/d capacity in total).

For the "Sur Zone", additional desalination capacity will be required in the 2017/2018 time frame, and a decision is expected in 2012 regarding the specific requirements of the proposed plant.

For the "Ad Duqm Zone", PAEW has requested RAEC to develop a 10,000 m^3/d (2 MIGD) desalination plant to meet expected demand growth to 2014. Plans for additional capacity thereafter are under consideration.

In Salalah, water demand is projected to grow at 6%, and peak water demand is expected to increase from 62,000 m^3/d in 2011 to 95,000 m^3/d in 2018. The Salalah IWPP will provide 68,190 m^3/d (15 MIGD) on commissioning in 2012. An additional desalination plant is expected to be procured for a 2016 in-service date; groundwater sources are available to meet interim requirements in excess of the Salalah IWPP capacity.

Procurement Activities

In the MIS in 2012, OPWP plans to procure 300 MW of temporary generation capacity (summer of 2012 only), and to commence procurement of the proposed solar IPP(s), subject to final Government approval. OPWP will also launch detailed studies to develop its strategy for (1) the renewal of P(W)PAs scheduled to expire, and (2) procurement of new power generation and water desalination capacity in the 2017-2018 timeframe. OPWP expects a 2012 completion date for the Ad Duqm study of water and power development options.

The next major procurement for the MIS after the Sur IPP is not expected to commence before 2013, as new capacity is not needed before 2017 under any of the demand scenarios.

In Salalah, site selection is in progress for the proposed Salalah I(W)PP2, with plans to issue a tender in 2012 for plant completion in 2016. The site selection will determine whether desalination capacity should be combined with the power plant, or go forward as a stand-alone, water-only plant.

OPWP plans to monitor closely the development of industrial demand in Salalah. If demand tracks the "high case" scenario, then temporary generation may be required in 2015, and a third Salalah IPP may be required by 2018.

Fuel Requirements

In the MIS, efficiency improvements in the generation fleet are expected to limit growth in fuel requirements to 5% per year through 2018, despite 8% growth in electricity production. Total gas consumption by the main power and desalination plants is projected to increase from 6.0 billion Sm^3 in 2011 to 8.2 billion Sm^3 in 2018.

In Salalah, gas requirements are projected to increase at 4%, reaching 0.8 billion Sm3 by 2018 as industrial power requirements grow rapidly and water requirements are met increasingly by new desalination capacity.

OPWP projects that the medium-term committed gas allocation for power generation (and associated water production) will cover requirements through 2018 under the "low case", through 2016 under the "expected case", and through 2015 under the "high case" scenario. Additional quantities are subject to confirmation by MOG. Should further gas allocations be unavailable, OPWP would likely bring forward plans to procure new generation capacity using other fuels, or consider other options.

Long-Term Strategy

In 2011, OPWP developed internal capabilities for power system simulation to support longer-term planning. OPWP plans to continue developing a long-term strategy with regard to fuel diversity and security, and the roles of renewables, nuclear power, and regional interconnects.

SECTION 1 MAIN INTERCONNECTED SYSTEM

The Main Interconnected System (MIS) covers the Governorate of Muscat, the Governorate of Buraymi and most of the Al Batinah North, Al Batinah South, Ad Dakhiliyah, Ash Sharqiyah North, Ash Sharqiyah South and Ad Dhahirah Governorates, serving around 600,000 electricity customers.

It comprises a number of power generation facilities, owned and operated by various companies; a single 220/132 kV transmission grid, owned and operated by Oman Electricity Transmission Co. (OETC); and three distribution networks, owned and operated by Muscat Electricity Distribution Co. (MEDC), Mazoon Electricity Co. (MZEC) and Majan Electricity Co. (MJEC). The three distribution network operators also act as "licensed electricity suppliers", supplying existing and new electricity customers in their respective service areas. The MIS is presently interconnected with the power systems of Petroleum Development Oman (PDO) and the Emirate of Abu Dhabi.

Several of the power generation facilities connected to the MIS produce desalinated water in conjunction with electricity, to meet the regional requirements of "water departments" responsible for supplying water to customers (including the Public Authority for Electricity and Water (PAEW), Sohar Development Office, and Majis Industrial Services Co. (MISC)).

OPWP's role is to aggregate the power and desalinated water requirements of licensed electricity suppliers and water departments, and to economically procure the required power and desalinated water in bulk from generation/production facilities connected to the MIS and interconnected systems. OPWP is required to ensure that sufficient power generation resources are available to meet licensed electricity suppliers' demands and, wherever beneficial, to co-procure desalinated water to meet the needs of water departments.

1.1 DEMAND FOR ELECTRICITY

OPWP evaluates electricity demand at the system level, including losses of the transmission and distribution system with consumer-level loads. To be consistent with this approach, OPWP evaluates the output of power generation plants at the delivery point(s) to the power system, excluding the internal power consumption of auxiliary systems. These approaches assure equivalence toward planning the generation supply required to meet consumer demand. However, from the perspective of power system operations, electricity demand and output are monitored at available metering points located at substations and power plants. The system "gross demand" at any point in time is the sum of the metered output at all power generators, although a portion of that generator output must be consumed by plant auxiliary systems. System peak demand is considered as net of plant auxiliaries and any exports to other power systems. The hourly consumption of plant auxiliary systems is not measured directly at some plants and in these cases must be estimated. Consequently, there may be differences in peak demand reports, depending on how auxiliary consumption at each plant is estimated.

OPWP evaluates system peak demand on the basis of measured "gross system demand" less plant auxiliary power consumption, using actual measured auxiliary consumption where available or nominal contract values where an estimate is required. This result is verified using a load-based methodology, considering measured distribution and bulk customer loads plus system losses.

OPWP follows a similar approach with respect to estimating water demand, the output of desalinated water plants, and the consumption of auxiliary systems of combined power and water plants.

Historical Demand

In 2011, electricity demand growth returned to a relatively robust level, following the modest growth in 2010, which had been attributed to weather-related factors. Peak demand increased by 10% to 3845 MW, whilst average demand increased by 12% to 2162 MW (corresponding to 19 TWh of energy). [1] This followed growth in average demand of 7% in 2010,[2] and 12-13% per year in 2008 and 2009.

The resurgence of demand growth in the past year is due partly to a recapture of unrealized 2010 growth that had been suppressed by weather effects. However, given the continuing weak global economic outlook, OPWP expects that electricity demand growth in the medium term will follow long-term trends rather than returning to the explosive growth experienced in 2008 and 2009.

Looking back over the last 10 years, peak electricity demands in the MIS grew at a rate of about 9% per year over the five years from 2006 to 2011, and about 7% per year over the ten years from 2001 to 2011. The growth in energy consumption (or average demand) has generally followed peak demand growth over the years, though at a slightly higher rate as the system load factor (the ratio of average to peak demand) has gradually increased. Average demand (energy) increased about 10% per year over the five years from 2006 to 2011, and about 9% per year over the ten years from 2001 to 2011.

These figures smooth out the impact of year to year variations caused by weather, such as in 2010, and the unusually rapid growth of 2008-2009, and are considered to be more representative of the underlying trends. The 2011 growth was consistent with these medium-term trends.

Demand Projections

OPWP's 7-year electricity demand projections for the MIS have been developed after consultation with MEDC, MZEC, MJEC, RAEC and other relevant entities.

The projections cover both average demand (i.e. energy) and peak demand, the latter being most relevant for purposes of assessing capacity requirements. This accords with the basis on which OPWP transacts with power and desalination plants.

The projected demands are based on an assumption of "normal" weather, considering a baseline developed from historical patterns of the past 5-10 years. It needs to be recognized that variations in weather in any particular year can have a significant impact on electricity demand, and particularly on peak demand – as was seen in 2010. The impact of weather in future years is an inherent uncertainty in the projections.

The projections are built up from separate analyses of distribution system demands, which are assessed on a "macro" basis by region, and certain bulk loads – mainly large industries – that are directly connected to the transmission system or power plants and which are assessed on a specific load-wise basis.

The principal drivers of distribution system demand are residential and service sector (including government and private sector) demands in all regions – from continuing growth of population and the number of households, and general economic development and new construction.

[1] OETC reported a 2011 peak MIS "gross" demand (including auxiliary consumption inside power and desalination plants) of 4000 MW at 3 pm on Saturday, June 18. Net of auxiliary consumption and export to the PDO system, the peak system demand is estimated to have been about 3845 MW.

[2] Peak demand increased by only 2% in 2010, suppressed by the effects of Cyclone Phet and below-normal peak summer temperatures.

The growth in demand from directly-connected loads is driven primarily by new industrial consumers, focused mainly around the Sohar Industrial Port, but with the possibility of increased development at Sur. Specific provision has also been made in the projections for the demands of potential new stand-alone desalination plants in Muscat and in the Al Batinah North Governorate.

The projections are presented as a range with a "low case", a "high case" and a central, expected demand forecast. The projections are summarized in Figure 1 below.

Under the central forecast, average demand in the MIS is expected to grow from 2162 MW (corresponding to 19 TWh) in 2011 to 3669 MW (32.1 TWh) in 2018, an average increase of around 8% per year. Peak demand is also expected to grow at about 8% per year, from 3845 MW in 2011 to 6582 MW in 2018. The forecast envisages a reduced growth rate compared to the 9% average rate projected in OPWP's 2011-2017 7-Year Statement. This view recognizes the effects of a more persistent global economic slowdown than had been expected a year ago, while also considering the government's commitment to stimulate economic growth through investment in infrastructure, as evident in the recent 5-year plan. The 8% growth rate is consistent with the average growth rate over the period 2000 to 2010, though it is less than the rapid growth experienced during the latter part of that period.

Under the "low case" scenario, the medium-term growth rate of both average and peak demands is reduced to around 6% per year. This scenario generally reflects the possibility of a weaker than expected economic backdrop, such as might occur if oil prices fall back due to continuing weakness in European and North American markets. For comparison, the 6% annual growth rate under this scenario is roughly equivalent to that seen through much of the 1990s.

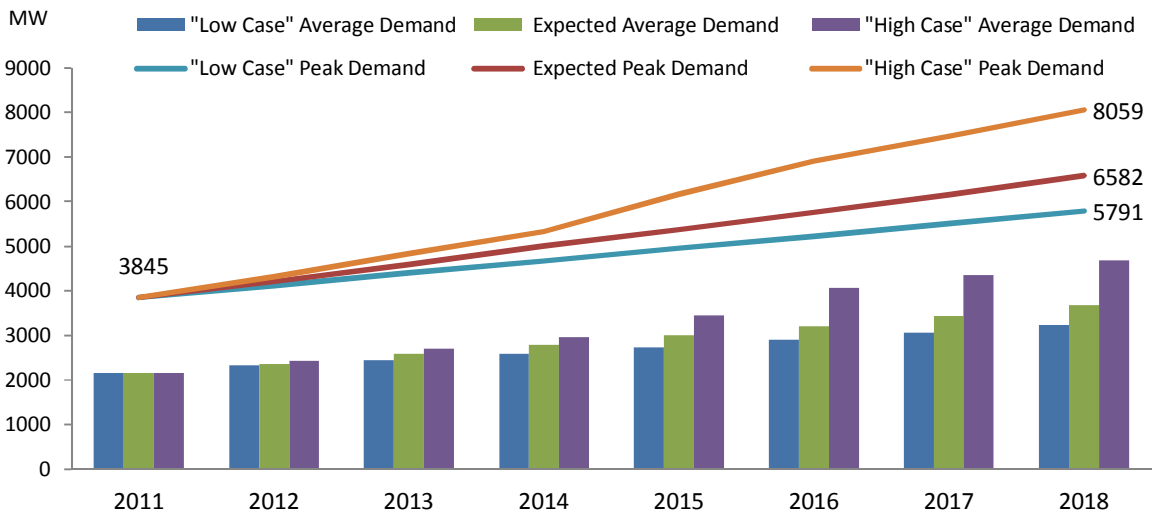
In contrast, the "high case" scenario generally reflects the possibility of a stronger than expected economic backdrop, such as might occur if oil prices increase due to robust growth in Asian markets and resolution of the economic crises in Europe and North America. Under this "high case" scenario, average and peak demands are projected to increase at a rate of about 12% per year over the 7-year horizon, including several years of very rapid growth comparable to that experienced in 2008 and 2009. This scenario is marked by a very significant build-up in large industrial loads, as a positive economic climate coupled with continued low (subsidized) electricity prices encourage the development of energy-intensive industrial projects.

Whilst considered much less likely than the expected demand scenario, the "low case" and "high case" scenarios are intended to represent the range of reasonably credible future demand paths around the expected demand projection, against which the requirements for generation resources need to be assessed and an appropriate generation procurement strategy developed. In particular, OPWP has to balance the need to have a feasible plan to meet "high case" demands at reasonable cost should these arise (taking into account the lead times associated with procuring capacity), whilst at the same time minimizing the risks of finding itself over-committed to costly generation capacity in the event of demand following the "low case" path.

Connection of MIS with Ad Duqm

The town of Ad Duqm and surrounding areas in the Al Wusta Governorate are currently located within the service area of RAEC and are not connected with the MIS. Current arrangements for electricity supply are based around a 67 MW diesel-fuel fired power plant operated by RAEC.

Figure 1 Electricity Demand Projections – MIS



	Actual 2011	2012	2013	2014	2015	2016	2017	2018	*Ave.% Growth*
Expected Demand									
Average Demand (MW)	2,162	2,360	2,588	2,778	2,992	3,204	3,434	3,669	8%
Distribution Loads	1,978	2,157	2,319	2,481	2,655	2,843	3,044	3,260	7%
Directly-Connected Loads	184	203	269	296	337	362	390	409	12%
Annual Energy (TWh)	19.0	20.7	22.7	24.3	26.2	28.1	30.1	32.1	8%
Peak Demand (MW)	3,845	4,216	4,594	5,007	5,374	5,760	6,151	6,582	8%
Change from 2011-2017 Statement (MW)	*-203*	*-167*	*-120*	*-72*	*-114*	*-163*	*-220*	*n/a*	
"Low Case" Demand									
Average Demand (MW)	2,162	2,323	2,446	2,589	2,723	2,903	3,063	3,223	6%
Distribution Loads	1,978	2,122	2,244	2,366	2,495	2,631	2,775	2,927	6%
Directly-Connected Loads	184	201	202	223	228	272	288	296	7%
Annual Energy (TWh)	19.0	20.4	21.4	22.7	23.9	25.5	26.8	28.2	6%
Peak Demand (MW)	3,845	4,115	4,396	4,676	4,947	5,227	5,501	5,791	6%
Change from 2011-2017 Statement (MW)	*-71*	*-50*	*18*	*65*	*79*	*89*	*99*	*n/a*	
"High Case" Demand									
Average Demand (MW)	2,162	2,427	2,698	2,962	3,446	4,068	4,361	4,682	12%
Distribution Loads	1,978	2,197	2,406	2,622	2,858	3,117	3,400	3,709	9%
Directly-Connected Loads	184	230	293	340	588	951	962	973	27%
Annual Energy (TWh)	19.0	21.3	23.6	25.9	30.2	35.7	38.2	41.0	12%
Peak Demand (MW)	3,845	4,320	4,827	5,325	6,173	6,908	7,458	8,059	11%
Change from 2011-2017 Statement (MW)	*-324*	*-261*	*-276*	*-687*	*-430*	*-312*	*-441*	*n/a*	

However, as a result of Government plans to promote the development of a major industrial and economic city around the new seaport at Ad Duqm, demand for electricity is expected to grow rapidly in the coming years. RAEC has provided projections that show peak demands increasing to around 75-100 MW by 2018.

Ad Duqm has been previously identified as a potential location for a large power generation plant, intended both to serve local demands and supply power into the MIS. Previous 7-Year Statements have shown Ad Duqm being connected with the MIS from around 2015 onwards, mainly due to the anticipated development of a large power generation plant.

OPWP is currently performing a comparative evaluation of several strategic options involving the development of a power generation plant at Ad Duqm, with or without an interconnection with the MIS (and/or other power systems in the vicinity, such as the PDO power system). This study also investigates the feasibility of incorporating outlying localities, such as towns along the eastern coast from Shiwaimia to Mahoot and Haima, into the network to be supplied by the Al Duqm power generation plant. This evaluation is expected to be completed after the publication of this 7-Year Statement, and hence, as it is uncertain whether the demands of Ad Duqm will become MIS demands, the prospective Ad Duqm demands have been excluded from the MIS demand projections in this 7-Year Statement.

In the event that a connection of the MIS with Ad Duqm is completed within the 7-year horizon, then the Ad Duqm demands would be additional to the MIS demands presented above, commencing in the year of connection. However, based on the projections provided by RAEC, the addition of these demands would have a relatively minor impact on the overall level of MIS demand.

Exports to Interconnected Systems

The MIS is interconnected with the PDO power system at Nizwa through a 132 kV link, and with the power system of the Emirate of Abu Dhabi through a 220 kV link.

These interconnections provide reliability benefits through the sharing of generation reserves, and currently there are no arrangements for commercial export or import of power with those systems. Hence, the current MIS demand projections (presented above) include the native demands of the MIS only. However, these interconnects provide the opportunity for commercial power transactions in the future, which could then have implications for the expected demand to be served by generation resources in the MIS.

1.2 POWER GENERATION RESOURCES

Sources of Power

In order to meet demand for electricity in the MIS, OPWP purchases power from a number of sources via power purchase agreements (PPAs), power and water purchase agreements (PWPAs) and other similar agreements. The contractual arrangements for power delivery under these agreements may be differentiated as firm capacity, reserve-sharing, non-firm capacity, and energy-only, as these terms are relevant for generation planning purposes.

All of the main power (and desalination) plants in the MIS are contractually committed to provide a specific generation capacity (in MW) upon demand, to be dispatched by the OETC, and to maintain specific availability levels. These are firm capacity contracts, also termed ***"contracted capacity"***. Temporary generation also belongs with this group.

OPWP also purchases power from a number of sources where the contractual arrangements do not provide sufficient reliability for resource adequacy plans. These may be termed collectively as **"non-firm resources"**. They currently include reserve-sharing arrangements with other power systems via interconnection agreements, and capacity exchanges or energy purchases from industries with captive power generation facilities used mainly for self-supply. In these cases no specific capacity is committed to OPWP, and the availability of capacity for use by OPWP at any particular time will generally be subject to the other party's first use. These resources provide reliability benefits to the MIS, in that capacity is generally available according to pre-arranged schedules (though not *committed* as dispatch-able capacity). Importantly, some of these resources may represent prospective contractual opportunities for firm, dispatch-able capacity (such as the interconnects) in the future.

In addition to these resources currently under contract, there are **"prospective resources"** that are under consideration by OPWP. For example, certain power generation units among the currently contracted plants will fall out of contract during this seven-year period, and OPWP must consider whether to allow these units to retire, to extend the term of the contract, or to contract for refurbishment or performance-related modifications of the units. This category also includes resources that are under evaluation or for which the tendering process has begun but is not complete.

Contracted Capacity

OPWP's present portfolio of contracted capacity in the MIS comprises eleven P(W)PAs. Eight of these relate to existing operational power (and desalination) plants, whilst three relate to plants currently under construction. Details of these P(W)PAs are shown in Table 1 below.

Table 1 Details of P(W)PAs – MIS

Plant	Contract Type	Plant Owner	Plant Status	Plant Type	Contract Expiry[a]
Ghubrah	PWPA	Al Ghubrah Power and Desalination Co. (SAOC)	Operational	OCGT/Steam MSF Desalination Natural gas fired (Fuel oil as back-up)	2018
Rusail	PPA	Rusail Power Co. (SAOC)	Operational	OCGT Natural gas fired (Fuel oil as back-up)	2022
Wadi Jizzi	PPA	Wadi Al-Jizzi Power Co. (SAOC)	Operational	OCGT Natural gas fired (Fuel oil as back-up)	2020
Manah	PPA	United Power Co. (SAOG)	Operational	OCGT Natural gas fired (Fuel oil as back-up)	2020
Al Kamil	PPA	Al Kamil Power Co. (SAOG)	Operational	OCGT Natural gas fired (Fuel oil as back-up)	2017
Barka I	PWPA	ACWA Power Barka (SAOG)	Operational	CCGT MSF Desalination Natural gas fired (Fuel oil as back-up)	2018
Sohar I	PWPA	Sohar Power Co. (SAOG)	Operational	CCGT MSF Desalination Natural gas fired (Fuel oil as back-up)	2022
Barka II	PWPA	SMN Barka Power Co. (SAOC)	Operational	CCGT RO Desalination Natural gas fired (Fuel oil as back-up)	2024
Sohar II	PPA	Al Batinah Power Co. (SAOC)	Under Construction	CCGT Natural gas fired (Fuel oil as secondary fuel and back-up)	2028
Barka III	PPA	Al Suwadi Power Co. (SAOC)	Under Construction	CCGT Natural gas fired (Fuel oil as secondary fuel and back-up)	2028
Sur	PPA	Phoenix Power Co. (SAOC)	Under Construction	CCGT Natural gas fired (Fuel oil as back-up)	2029

[a] *in all cases the contracts expire prior to the summer period of the year indicated*

A summary of the MW capacity that is expected to be provided under these P(W)PAs over the 2012-2018 period is set out in Figure 2 below. This shows total contracted capacity of 4807 MW in 2012, rising to a maximum of 6910 MW in 2014, before falling back to 5844 MW by 2018. The main developments over the 7-year period are:

- the Sohar II and Barka III plants currently under construction are scheduled to be commissioned on a phased basis in 2012 and 2013 – each adds 495 MW in 2012 and a further 250 MW in 2013 for a total addition of 1490 MW;
- the Sur Power Plant currently under construction is scheduled to be commissioned on a phased basis in 2013 and 2014 – phase one (early power), comprising two gas turbines operating in open cycle mode, adds 433 MW in 2013, and phase two, comprising the remaining three gas turbines and two steam turbines, will add a further 1567 MW in 2014, for a total addition of 2000 MW;

- a number of the older generation units at Ghubrah are scheduled to fall out of contract after the summers of 2012 and 2013, resulting in reductions of 150 MW and 90 MW respectively (the plant owner, GPDC, has advised OPWP that given their age and condition it intends to de-commission these units permanently at such time), and the remaining units at Ghubrah will fall out of contract prior to the summer of 2018 resulting in a further reduction of 235 MW if the contract is not renewed;

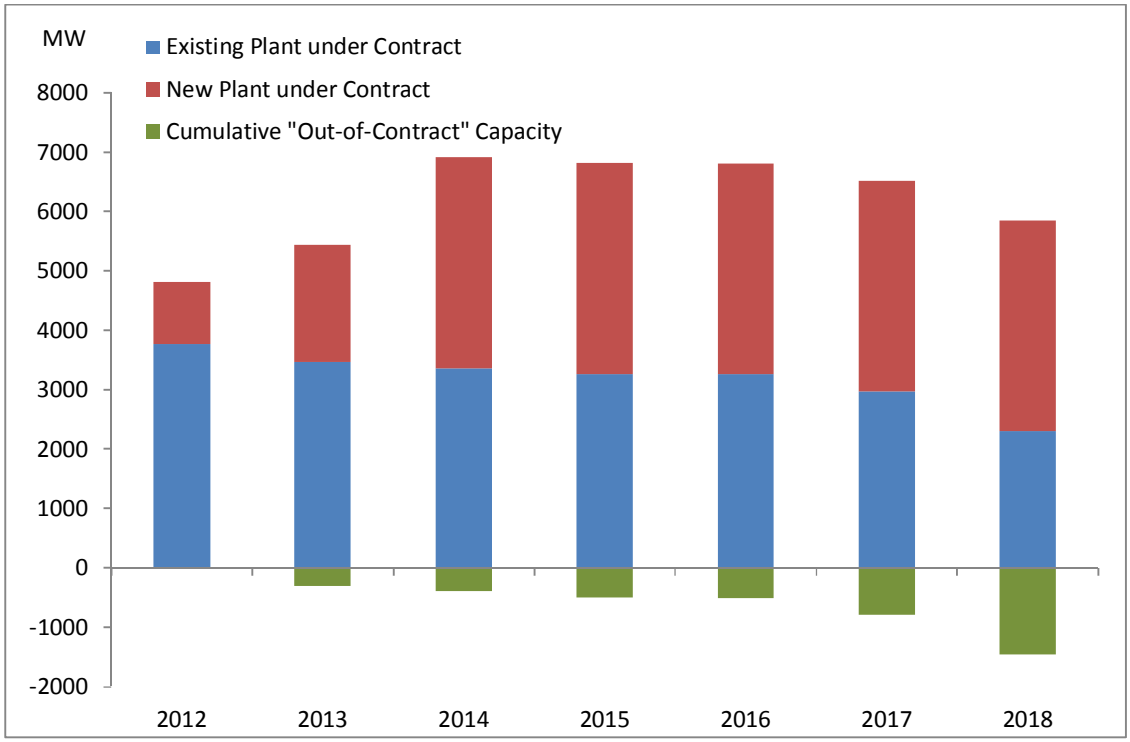
- several of the older generation units at Wadi Jizzi are scheduled to fall out of contract after the summers of 2012 and 2014 –in the absence of any further contract extension(s), this will result in reductions of 80 MW in 2013 and 88 MW in 2015 (the contract expiring in 2012 has already received a one-year extension);

- the PPA for the Al Kamil plant is due to expire prior to the summer of 2017 – if not renewed, this will result in a reduction of 282 MW of capacity in 2017;

- the PPA for the Barka I plant is due to expire prior to the summer of 2018 – if not renewed, this will result in a reduction of 435 MW of capacity in 2018;

- several temporary arrangements providing additional MW on a short-term basis are planned to run through 2012 only and if not extended will result in an aggregate reduction of 70 MW in 2013 – these include short-term agreements for an uplift in contracted capacity at Barka I and Al Kamil and an arrangement with PAEW to secure additional MW from Barka II though reduced desalinated water output during peak periods.

Figure 2 Contracted Generation Capacity – MIS



	2012	2013	2014	2015	2016	2017	2018
				Net MW [a]			
Current Contracted Capacity							
Ghubrah	475	325	235	235	235	235	-
Rusail	687	687	687	687	687	687	687
Wadi Al Jizzi	325	245	245	157	157	157	157
Manah	273	273	273	273	273	273	273
Al Kamil	297 [b]	282	282	282	282	-	-
Barka I	450 [b]	435	435	435	435	435	-
Sohar I	600 [b]	590	590	590	590	590	590
Barka II	710 [b]	679	679	678	678	678	678
Sohar II	495	745	742	740	739	738	738
Barka III	495	745	742	740	739	738	738
Sur	-	433	2000	1992	1988	1985	1983
TOTAL	**4,807**	**5439**	**6910**	**6809**	**6803**	**6516**	**5844**
Additions	*990*	*933*	*1567*	-	-	-	-
Reductions (out-of-contract)	-	*301*	*96*	*101*	*6*	*287*	*672*

[a] *all capacities are rated on a net basis (i.e. after allowing for auxiliary consumption inside the plants) at 45°C ambient temperature*

[b] *Short-term contracts for capacity uplifts that expire after the 2012 summer peak include: 15 MW uplift at Al Kamil, 15 MW at Barka I, 10 MW at Sohar I, and an arrangement with PAEW to obtain up to 30 MW on a contingency basis from Barka II by temporarily reducing output of desalinated water.*

Non-Firm Resources under Contract

In addition to the contracted capacity described above, OPWP has contracts with a number of other sources of power for the MIS, although these contracts are not for firm capacity commitments. These include:

- the 220 kV interconnect with the Abu Dhabi power system at Al Wasit;
- the 132 kV interconnect with the PDO power system at Nizwa; and
- the surplus generation of industries (and other parties) with captive power generation facilities used mainly for self-supply.

A 220 kV interconnection between the MIS and the Abu Dhabi power system was commissioned in 2011 and is now in operation. This double circuit link currently supports transfers of up to 200 MW. The main purpose of this interconnect as currently envisioned is to support reserve sharing, subject to the availability of surplus generation in either system. Transco Abu Dhabi expects to award a project in 2012 to upgrade its side of the link to 400 kV. This will upgrade the transfer capacity of the interconnection to 400 MW by 2015.

The MIS is connected with the power system of PDO at Nizwa via a single 132 kV link with a nominal transfer capacity of around 60 MW. The main purpose of this interconnect is to support reserve sharing between the MIS and the PDO system, providing improved reliability in both systems by allowing each system access to unused reserve in the other system in contingency scenarios. Thus, subject to the availability of surplus generation in the PDO system at the time required, up to around 60 MW of support can be provided to the MIS to help manage contingencies.

In addition to support for reserve-sharing arrangements, both the PDO and the Abu Dhabi interconnections could potentially support "commercial" imports in the future – based on the relative costs of generation in the respective systems.

Several industries with captive power plants are connected with the MIS and have surplus power that is purchased by OPWP. Chief among these is OPWP's agreement with Sohar Aluminium Co. (LLC), whereby Sohar Aluminium exports up to 300 MW to the MIS during the summer, and imports a like amount of energy from OPWP during the winter on an annually determined schedule. The schedule and operations are managed to assure that energy exports balance with energy imports. This arrangement benefits both parties: Sohar Aluminium is better able to schedule the maintenance of its generating units and gains reliability of supply, while OPWP gains an efficient generating resource during the summer.

Agreements with other industries range from economic purchases of surplus generation as available to scheduled purchases of surplus peaking capacity (when available). These agreements have generally been for short terms (one to three years) and are considered renewable so long as the surplus capacity remains available, and both economic and operational terms are agreeable.

All of the current agreements for surplus capacity from industries are scheduled to expire by the end of 2012: agreements with Sohar Aluminium (300 MW) and Oman Mining Co. (20 MW) are expected to be renewed, though potentially in a modified form, whereas Oman Refineries and Petrochemicals Co. (15 MW) plans to allow the agreement to expire because it requires that capacity to meet its own production requirements. OPWP has economic purchase arrangements with Oman Cement Co. (SAOG), Oman India Fertilizer Co. (SAOC) and the Ministry of Defense, which are expected to be available for renewal annually. These latter agreements are considered as energy purchases (at tariffs beneficial to the system), although they each also represent a source of contingency reserve in the range of 0 – 5 MW depending upon availability.

Access to these captive power generation resources is useful in two respects. Firstly, they provide a source of contingency reserve for the MIS, over and above the reserve margin provided by OPWP's portfolio of contracted capacity. And secondly, they can in some instances provide an economical source of energy – by providing low cost energy to the MIS in place of higher cost energy from contracted generation capacity, the overall cost of energy for the MIS can be reduced. The agreements in place with the respective parties are specifically designed to allow both of these benefits to be obtained.

Prospective Resources

Toward considering how to meet generation capacity requirements as projected power demand overtakes contracted capacity, OPWP assesses various prospective resources. These resources include the following:

- Contract extensions, such as for generation units that are scheduled to fall out of contract
- New contracted capacity
- Temporary generation
- Capacity purchases from interconnected power systems or industrial self-generation

Prospective contract extensions correspond to capacity that is scheduled to fall out of contract, but that may be offered to OPWP by the plant owner for extension of the contract term (subject to satisfaction of relevant regulatory requirements and commercial terms being agreed). These resources represent prospective contracted capacity, and OPWP will consider such options alongside options to contract for new generation capacity.

The prospective contract extensions comprise the capacity at Wadi Jizzi, Al Kamil and Barka I that falls out of contract over the coming years. Preliminary discussions with the owners of these plants have indicated that they would anticipate offering the relevant capacity to OPWP after the expiry of the current contracted period. This category also includes possible extension of the temporary contracted capacity uplifts at Barka I, Sohar I and Al Kamil, which otherwise expire after the summer of 2012. These resources are summarized in Table 2.

Table 2 Prospective Contract Extensions

	2012	2013	2014	2015	2016	2017	2018
				Net MW [a]			
Wadi Al Jizzi	-	80	80	168	168	168	168
Al Kamil	-	15	15	15	15	297	297
Barka I	-	15	15	15	15	15	450
Sohar I	-	10	10	10	10	10	10
TOTAL	**-**	**120**	**120**	**208**	**208**	**490**	**925**

[a] *all capacities are rated on a net basis (i.e. after allowing for auxiliary consumption inside the plants) at 45°C ambient temperature*

The arrangement with PAEW and Barka II to provide contingency reserves could also be extended beyond its current 2012 expiry. This allows OPWP to obtain an additional 20-25 MW of capacity from Barka II by reducing the output of the water desalination plant, with the understanding that this may occur only for a few hours at a time during the period of peak electric demand, and to the extent that reserve water capacity is available in the system.

OPWP is currently considering several options for new contracted capacity. A Government initiative to promote the development of grid-connected solar power projects represents one such option. Subject to the Government providing a final go-ahead, this is likely to involve OPWP procuring, via a competitive process, around 200 MW of solar generation capacity for the MIS, potentially to be in service by the end of 2015. However, whilst this capacity is expected to be committed to OPWP via a PPA, the inherent intermittency risk associated with solar generation (unless mitigated with energy storage) may lead to the "effective capacity" of the plants – for resource adequacy purposes – being somewhat less than the nominal capacity.

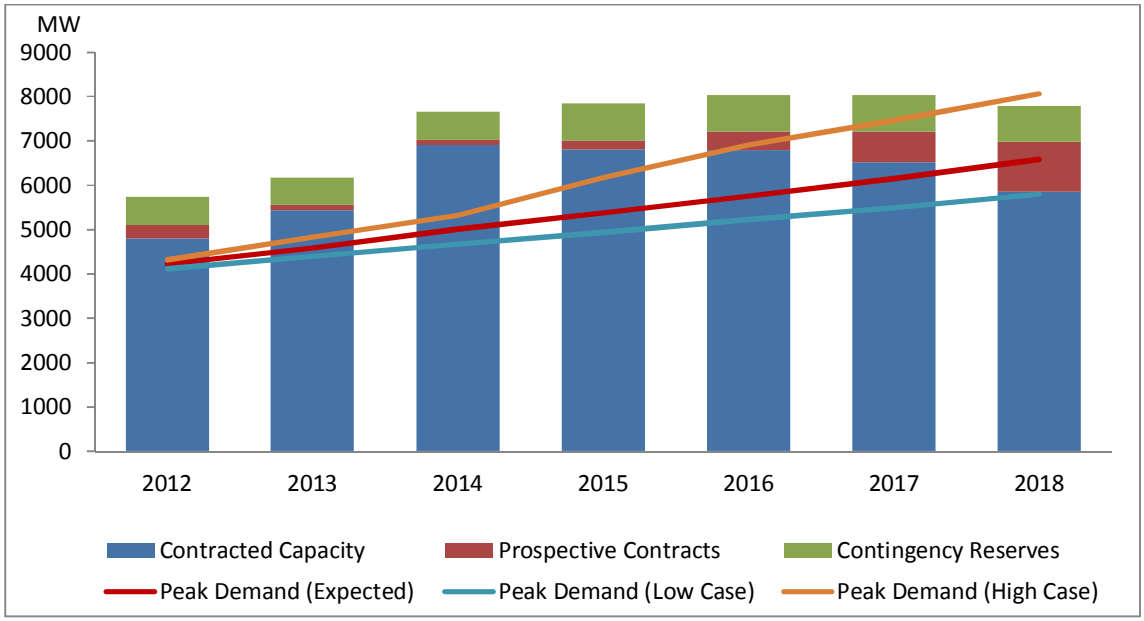
During 2011, OPWP conducted a competitive procurement process for the provision of temporary generation capacity for the summer of 2012. This capacity addresses the risk of a potential delay in commissioning of the early power phase at either Barka III or Sohar II. The approved contingency case considers a delay of one to two months for two units at one or the other of these plants, which could then miss the summer peak that typically occurs in May or June. As a result of this procurement process, OPWP entered into PPAs during the first quarter of 2012 for about 300 MW of contracted capacity. This will specifically supplement the 2012 contracted capacity.

As discussed above, OPWP plans to extend agreements to purchase industrial surplus generation, to the extent that these resources remain available. These and the reserve-sharing arrangements with neighboring systems (PDO and Abu Dhabi) represent prospective contingency reserves.

Summary

Figure 3 below provides a summary of all the generation resources that OPWP expects to have available for the MIS for the period 2012 to 2018, including both contracted capacity and prospective resources. Prospective resources are differentiated further as contracted capacity (contract extensions, temporary generation and planned plants) versus non-firm resources. The non-firm resources are considered as contingency reserves. They provide an indication of the potential extent of additional reserves that may be made available in contingency situations during the forecast period.

Figure 3 Total Power Generation Resources – MIS



	2012	2013	2014	2015	2016	2017	2018
			Net MW				
Contracted Capacity							
Currently Contracted Capacity (Details in Figure 2)	4807	5439	6910	6809	6803	6516	5844
Prospective Contracted Capacity							
Prospective Contract Extensions (Details in Table 2)	-	120	120	208	208	490	925
Temporary Diesel	300	-	-	-	-	-	-
Solar Project(s)	-	-	-	-	200	200	200
Total – Contracted + Prospective	**5107**	**5559**	**7030**	**7017**	**7211**	**7206**	**6969**
Contingency Reserves							
Agreements for Temporary Reduction of Desalinated Water Production[a]							
Barka II	25	25	25	25	25	25	25
Reserve-Sharing Agreements							
PDO Interconnection	60	60	60	60	60	60	60
Abu Dhabi Interconnection	200	200	200	400	400	400	400
Surplus Generation Agreements[a]							
Sohar Aluminium Co.	*300*	*300*	*300*	*300*	*300*	*300*	*300*
Oman Refineries & Petrochemicals Co.	15	-	-	-	-	-	-
Oman Mining Co.	20	20	20	20	20	20	20
Oman Cement Co.	0-5	0-5	0-5	0-5	0-5	0-5	0-5
Oman India Fertilizer Co.	0-5	0-5	0-5	0-5	0-5	0-5	0-5
Ministry of Defense	0-5	0-5	0-5	0-5	0-5	0-5	0-5
Total Contingency Reserves	**635**	**620**	**620**	**820**	**820**	**820**	**820**
ALL RESOURCES	**5742**	**6179**	**7650**	**7837**	**8031**	**8026**	**7789**

[a] *The existing agreements for surplus generation and temporary reduction of desalinated water production will expire in 2012. For the years beyond 2012, it is assumed that agreements can be extended, although the indicated capacities are illustrative as contract terms may be modified.*

1.3 ADDITIONAL POWER GENERATION REQUIREMENTS

Statutory and Regulatory Requirements

OPWP is required by the Sector Law and its license to ensure the adequacy of generation resources to meet future power demands. The Sector Law establishes OPWP's general responsibility to secure sufficient generation resources to meet the aggregated demands of licensed electricity suppliers. Further to this, the license issued to OPWP by the Authority for Electricity Regulation, Oman (AER) stipulates a specific generation security standard for the MIS that OPWP must comply with.

The generation security standard stipulated by the AER is based on loss of load hours (known as "LOLH") and essentially requires that OPWP enter into agreements for enough *contracted capacity* to ensure that the expectation of this capacity being insufficient to meet demand does not exceed 24 hours in any year – taking into account relevant uncertainties such as the reliability of generation units. On a short-term basis, OPWP must demonstrate to the AER that such agreements are in place. On a longer-term basis, OPWP must demonstrate that it has credible plans to put such agreements in place (via the procurement of new capacity or otherwise).

It is important to note that for purposes of the 24 hour LOLH standard, only contracted capacity is considered – whilst other resources (such as the surplus generation of industries and reserve sharing arrangements with interconnected systems, as described above) provide a degree of reserve margin and will generally contribute to improved overall reliability of supply, these resources are not considered for purposes of meeting the 24 hour LOLH standard and are viewed instead as providing security against contingencies.

2012 Capacity Requirement

OPWP determined, and agreed with the AER, the need to enter into agreements in respect of 300 MW of temporary generation capacity. As described above, the temporary generation addresses the risk of a potential delay in commissioning of the early power units at Barka III or Sohar II. OPWP conducted a competitive procurement process during 2011 for the provision of this temporary capacity and entered into the relevant agreements in the first quarter of 2012 – in time for the facilities to be installed and commissioned ahead of the summer peak demand period.

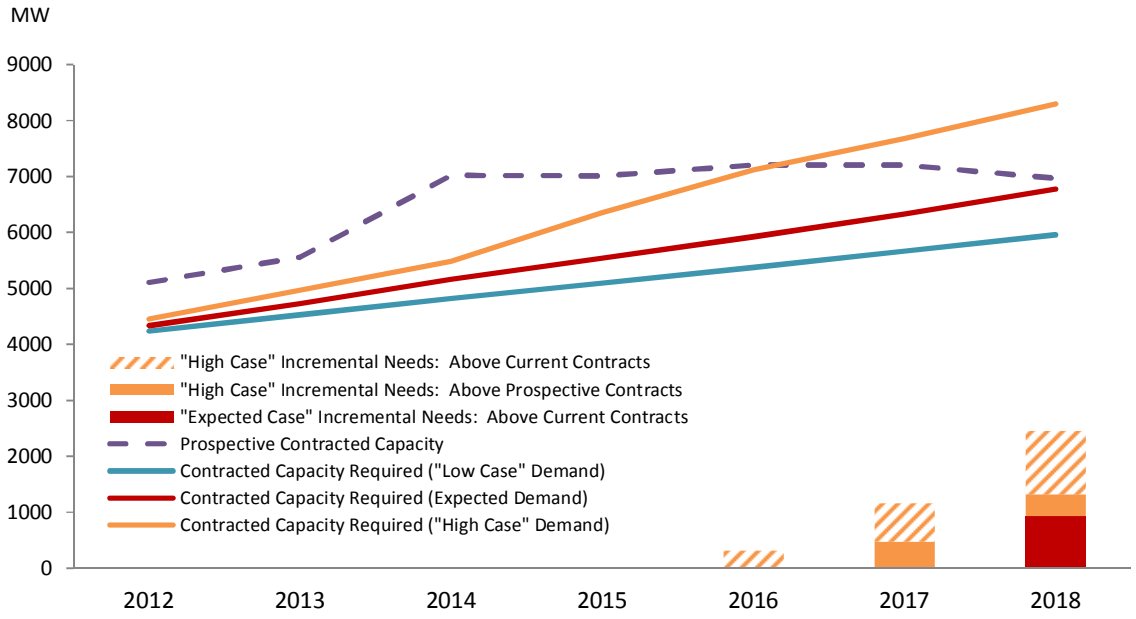
Future Capacity Requirements

OPWP has calculated the approximate amounts of contracted capacity it would require to comply with the 24 hour LOLH standard in each year during the 2012-2018 period, in the context of the three demand projections described in section 1.1 above (i.e. expected demand, "low case" and "high case"). The approximate total requirements are shown in Figure 4 below along with the *additional* requirements – relative to the currently contracted capacity, and relative to the prospective contracted capacity identified in Figure 3 above.

It can be seen that the capacity additions at Sur, Barka III and Sohar II are likely to be sufficient to meet requirements until around 2018. At that time, substantial incremental capacity needs emerge relative to current contracted capacity under the Expected Demand scenario. There are prospective contracts for capacity that would meet this requirement, including the solar project(s) and potential contract extensions at Al Kamil, Wadi Al Jizi, and Barka I. The need for new generation capacity at that time will depend on the degree to which prospective contracts can be executed.

However, under the "high case" demand scenario, additional capacity may be needed sooner, in 2016/2017. OPWP believes that a potential requirement in 2016 of the indicated order of magnitude (317 MW) – in the relatively unlikely event of it transpiring – could be managed by a combination of prospective contract extensions, the solar project(s), and short-run measures such as temporary generation, although under this demand scenario a major plant would be needed in the following year (2017).

Figure 4 Future Power Generation Capacity Requirements – MIS



	2012	2013	2014	2015	2016	2017	2018
				Net MW			
Expected Demand Scenario							
Peak Demand	4216	4594	5007	5374	5760	6151	6582
Contracted Capacity Required	4340	4730	5160	5540	5930	6340	6780
Incremental Capacity Needed:							
Above Current Contracts	-	-	-	-	-	-	936
Above Prospective Contracts	-	-	-	-	-	-	-
"Low Case" Demand Scenario							
Peak Demand	4115	4396	4676	4947	5227	5501	5791
Total Contracted Capacity Required	4240	4530	4820	5100	5380	5670	5960
Incremental Capacity Needed:							
Above Current Contracts	-	-	-	-	-	-	116
Above Prospective Contracts	-	-	-	-	-	-	-
"High Case" Demand Scenario							
Peak Demand	4320	4827	5325	6173	6908	7458	8059
Total Contracted Capacity Required	4450	4970	5490	6360	7120	7680	8300
Incremental Capacity Needed:							
Above Current Contracts	-	-	-	-	317	1164	2456
Above Prospective Contracts	-	-	-	-	-	474	1331

Accordingly, OPWP believes that it can plan towards an earliest potential in-service date of 2017 for the next major installment of new generation capacity in the MIS after the Sur IPP, and the potential solar project(s). In the event that demand growth appears to be tracking lower than the "high case" projection over the next year or so, it may be possible to push back this in-service date prior to launching the relevant competitive procurement process (which would likely need to commence during 2013 to meet a 2017 in-service date).

Yet a further observation is that the scheduled contract expirations in 2017 and 2018 – at the Al Kamil, Ghubrah and Barka I plants – contribute significantly to the supply deficit at that time. These plants will have considerable useful life remaining (at least 10 years), although they are less efficient and less reliable than new plants would be. In the coming year, OPWP plans to consider the strategic options for extending these PPAs alongside options to contract for new capacity.

1.4 DESALINATED WATER REQUIREMENTS

Demand for Water

Water demand projections have been provided to OPWP by relevant "water departments", i.e.:

- PAEW – in respect of the demand for potable water in the Governorates of Muscat and Al Buraymi, and most of the Al Batinah North, Al Batinah South, Ad Dakhiliyah, Ad Dhahirah, Ash Sharqiyah North, Ash Sharqiyah South and Al Wusta Governorates[3]; and

- MISC – in respect of the demand for desalinated water for industrial use in the Sohar Industrial Port area.

In previous issues of the 7-Year Statement by OPWP, the water demand projections have been presented on a zonal basis with respect to the areas served by the principal sources of water: the desalination plants (or power and water desalination plants) known as Ghubrah, Barka I and II, Sohar I, Sur, and Ad Duqm. However, PAEW has advised that henceforward, for planning purposes, we will no longer differentiate the Ghubrah, Barka and Sohar Zones and will instead aggregate them as a single interconnected zone (the Interconnected Zone). This more accurately reflects the operational practice whereby water is transferred between localized zones, and presumes that going forward, transfer capacity between localized zones will be increased as and when required by PAEW.

The water demand projections are now analyzed using the following zones:

- The ***"Interconnected Zone"*** includes the potable water demands of the Governorate of Muscat; the Governorates of Al Batinah North, Al Batinah South, Buraymi, Ad Dakhiliyah, and Ad Dhahirah,[4] together with the MISC demands for the Sohar Industrial Port area.[5] The principal sources of water for

[3] The projections provided by PAEW exclude (i) the Governorate of Musandam, the wilayat of Quriyat in the Governorate of Muscat, and the wilayat of Masirah in the Ash Sharqiyah South Governorate, which are expected to be served by PAEW from local supply sources; and (ii) the Governorate of Dhofar, which is the responsibility of the Directorate General of Water in the Office of the Minister of State and Governor of Dhofar, and is addressed in section 2.4.

[4] PAEW plans to extend its network to include Ad Dhahirah in 2015, after the peak season. From then onwards, 50% of Dhahirah water demand is considered to be supplied from the Interconnected Zone, the balance to be supplied by retained groundwater wells.

[5] MISC has provided OPWP with a demand projection through 2018, but has specified that only the 2012 demand is to be met by OPWP supply. MISC expects that its own desalination plant will be commissioned in the fourth quarter of 2012, and that from 2013 to 2018 this plant will meet its water capacity requirements, with OPWP supply as backup only.

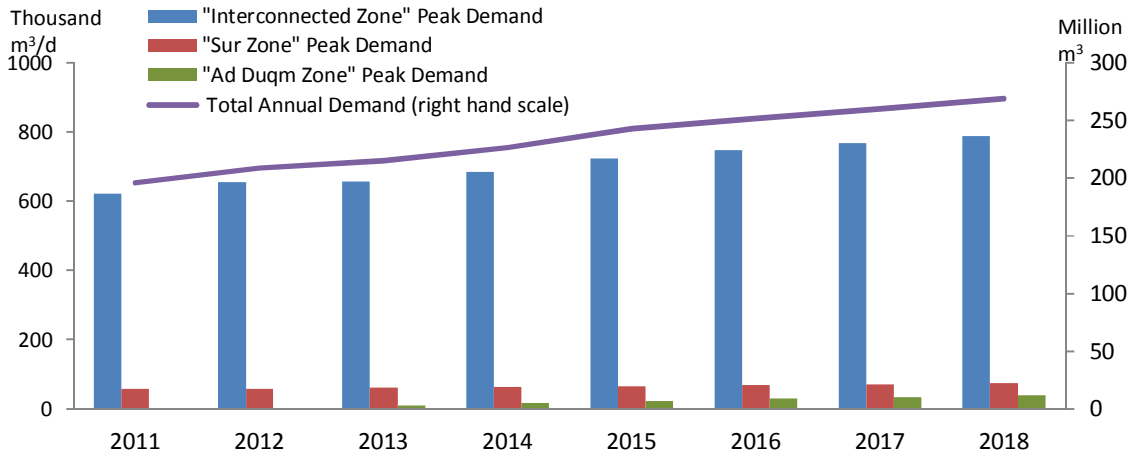
this zone are currently the existing Ghubrah Power and Desalination Plant, Barka I and Barka II Power and Desalination Plants, and Sohar I Power and Desalination Plant.

- The ***"Sur Zone"*** includes the potable water demands of the Ash Sharqiyah North and Ash Sharqiyah South Governorates excluding Masirah wilayat. The principal source of water for this zone is currently the existing Sur Desalination Plant.

- The ***"Ad Duqm Zone"*** includes the potable water demands of the Al Wusta Governorate. This zone is currently served by a small desalination plant in Ad Duqm and a number of local water sources.

The projected "peak demands" for these three zones, as provided by PAEW and MISC, for the 2012-2018 period are shown in Figure 5 below. Peak demand represents the average daily demand (inclusive of network losses), during the peak week of the year, and is the basis for assessing resource capacity requirements. Based on the peak demand figures, OPWP has estimated total annual demands and these are also shown in Figure 5.

Figure 5 Water Demand Projections – Main Supply Zones (excluding Dhofar)



	Est. 2011	2012	2013	2014	2015	2016	2017	2018	Ave.% Growth
Peak Water Demand					*thousand m^3/d*				
"Interconnected Zone"[a]	621	654	655	683	723	747	767	788	*3%*
"Sur Zone"	58	59	61	63	65	68	71	74	*4%*
"Ad Duqm Zone"	2	3	10	17	23	30	34	40	*53%*
Total - All Zones	**680**	**717**	**726**	**762**	**812**	**845**	**872**	**902**	***4%***
Change from 2011-2017 Statement	*64*	*35*	*-9*	*-41*	*-77*	*-57*	*-79*	*n/a*	
Total Annual Demand					*million m^3*				
All Zones	**196**	**209**	**215**	**227**	**243**	**252**	**260**	**269**	***5%***
Change from 2011-2017 Statement	*16*	*10*	*0*	*-7*	*-17*	*-11*	*-18*	*n/a*	

[a] *Peak water demand for the "Interconnected Zone" comprises data provided by PAEW and MISC.*

In overall terms, water peak demand is expected to increase at an average rate of around 4% per year over the seven year horizon – driven by increasing population, economic development and the build-out of water supply networks, but moderated to some extent by a major effort to reduce network losses. The highest growth rate is expected in the Al Duqm Zone, due to an accelerating level of economic activity.

The total water demands shown in Figure 5 indicate a reduction in growth rate relative to those included in OPWP's 2011-2017 7-Year Statement. The principal explanation is that in 2011, PAEW made significant progress in increasing its piped customer base and service coverage, transferring customers from water tanker supply to piped supply, absorption of private networks, and reduction in groundwater abstraction. There is also a downward adjustment (of around 7%) in the end-of-period demand reflecting PAEW's latest assessment of the likely development of demand.

Desalination Capacity Requirement – "Interconnected Zone"

In its 2011 water planning submission on water capacity requirement, PAEW has introduced the concept of "headroom" above normal demand, to provide the additional water capacity necessary to recover its transmission and distribution networks in the event of a failure of the networks or a failure of supply from a desalination plant. This represents a system security measure that is analogous to the generation security standard used to assess power generation capacity requirements. After an emergency, the water volumes in the PAEW reservoirs may be at a low level and will need to be replenished. Therefore, the capacity available to be drawn from desalination plants must be higher than normal demand, to allow for reservoir replenishment in the event of an emergency.

The recommended security standard is that the 24-hour peak demand on the system should be available for supply within a 21-hour period. This means that a reserve margin of 14.3% over peak demand should be considered as a capacity requirement for both water supply sources and the water transmission system.[6]

PAEW has advised that it has several sources of water available that offset the water capacity requirement to be provided by OPWP. These include existing wells (after reducing the drawdown to assure maintenance of aquifer capacity), the Wadi Dayqah surface water reservoir, and a contract for surplus water capacity available from the MISC RO plant starting in 2013. The capacity requirement for desalinated water is the total water capacity requirement less the peak yield of these PAEW sources.

The principal sources of water for the "Interconnected Zone" are currently the following Power and Desalination Plants:

- Ghubrah Power and Desalination Plant, owned by GPDC and operated under a PWPA with OPWP. The desalination plant comprises seven MSF units, with a total net capacity of approximately 182,000 m^3/d (40 MIGD).

- Barka I and Barka II Power and Desalination Plants, owned by ACWA Power Barka and SMN Power Barka respectively, and operated under PWPAs with OPWP. The Barka I plant has a desalination capacity of 91,200 m3/d (20 MIGD), using MSF units. The Barka II plant has a capacity of 120,000 m3/d (26 MIGD), using RO technology.

- Sohar I Power and Desalination Plant, owned by Sohar Power Company and operated under a PWPA with OPWP. The Sohar I plant has a desalination capacity of 150,000 m^3/d (33 MIGD), using MSF units.

[6] The 24-hour peak capacity requirement available in a 21-hour period corresponds to (24/21) x peak demand = 1.143 x peak demand, hence a 14.3% reserve margin.

A summary of the desalination capacity that is expected to be provided under these PWPAs over the 2012 – 2018 period is set out in Figure 6 on the following page. This shows total contracted desalination capacity of 549,000 m^3/d (121 MIGD) in 2012, rising to a maximum of 695,000 m^3/d (153 MIGD) in 2013 before falling back to 552,000 m^3/d (121 MIGD) in 2018.

The main developments over the 7-year period are:

- At Ghubrah, the PWPA provides for two of the older MSF units (units 1 and 2) to drop out of contract within the 2012/2013 timeframe, to be permanently decommissioned. However, Unit 1 was decommissioned prematurely in 2011; Unit 2 remains scheduled for decommissioning after the summer peak period in 2013. To compensate for the premature decommissioning of Unit 1, GPDC performed upgrades to Units 3 and 4, providing an additional 5,000 m^3/d (1 MIGD). All remaining units at the existing Ghubrah plant will fall out of contract in March 2018.

- The desalination capacity provided by GPDC under the PWPA is currently supplemented by a temporary RO plant at Ghubrah, which provides water directly to PAEW. This has a capacity of 23,000 m^3/d (5 MIGD). PAEW has indicated that it expects this plant to remain in place at Ghubrah until 2013, after the summer peak period.

- A new plant, the Ghubrah IWP, is under tendering by OPWP at a site adjacent to the existing Ghubrah Power and Desalination Plant. The Ghubrah IWP will use RO desalination technology, and will be contracted to provide 191,000 m^3/d (42 MIGD) upon commissioning in April 2014.

- The PWPA for Barka I will expire in April 2018. This will reduce contracted desalination capacity by 91,200 m^3/d (20 MIGD) unless the contract is extended.

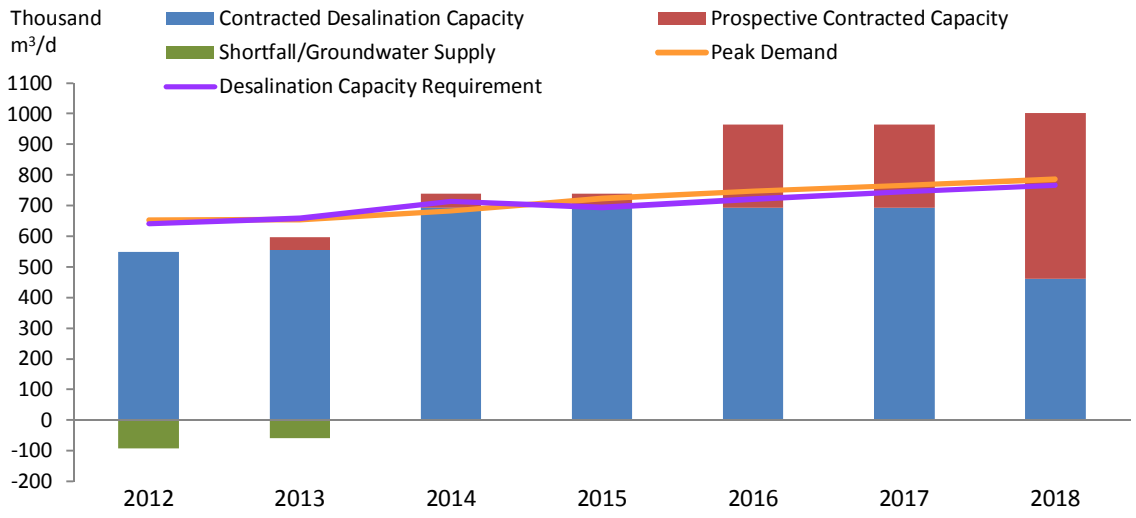
- MISC is developing a desalination plant utilizing RO technology, with capacity of 20,000 m^3/d (4 MIGD), to be commissioned at the end of 2012. MISC projects that this plant will meet all of its water demand from 2013 to 2018, and that MISC will require only backup water supply from OPWP during this period in case of shutdown of their RO plant.

ACWA Power Barka has submitted a proposal to increase the desalination capacity at Barka I by 45,000 m^3/d (10 MIGD), to be available from 2013. This represents prospective contracted capacity that may be available until the expiration of the existing PWPA term, although subject to extension.

Figure 6 below provides a summary of the demand/supply balance in the "Interconnected Zone" over the 2012 - 2018 period. Capacity shortfalls are projected in 2012 and 2013, although these are relative to the newly defined security standard, whereas groundwater supplies are sufficient to meet the previous target of peak water demand alone. The addition of the new Ghubrah IWP in 2014, and proposed increased capacity at Barka I, will provide sufficient capacity to meet the security standard from 2014 through 2016. New capacity would be required in 2017, although the shortfall is marginal at 5,000 m^3/d (1 MIGD), and could possibly be met by groundwater supplies. The expiration of contracts at Ghubrah and Barka I in 2018 will cause a significant supply shortage unless they are extended or new capacity is procured.

OPWP expects to meet the projected capacity shortfall through a combination of contract extension and new plant. OPWP has initiated site selection studies, at PAEW's request, for two new desalination plants serving the "Interconnected Zone", to be located at Suwayq and Qurayyat. The Suwayq plant is considered at about 225,000 m^3/d (50 MIGD), to be in service in 2016, whereas the Qurayyat plant is considered at about 180,000 m^3/d (40 MIGD), to be in service in the 2018/2019 time frame.

Figure 6 Desalination Capacity Reserve/Shortfall – "Interconnected Zone"



	2012	2013	2014	2015	2016	2017	2018
"Interconnected Zone"	*thousand m³/d*						
Peak Water Demand	**654**	**655**	**683**	**723**	**747**	**767**	**788**
Water Capacity Requirement	**745**	**749**	**781**	**827**	**854**	**877**	**900**
Peak Yield of PAEW Sources[a]	*103*	*90*	*67*	*132*	*132*	*132*	*132*
Desalination Capacity Requirement	**642**	**659**	**714**	**695**	**722**	**745**	**768**
Contracted Desalination Capacity							
Ghubrah Power and Desalination Plant	*165*	*170*	*143*	*143*	*143*	*143*	*-*
Temporary Units at Ghubrah	*23*	*23*	*-*	*-*	*-*	*-*	*-*
Barka I Power and Desalination Plant	*91*	*91*	*91*	*91*	*91*	*91*	*-*
Barka II Power and Desalination Plant	*120*	*120*	*120*	*120*	*120*	*120*	*120*
Sohar I Power and Desalination Plant	*150*	*150*	*150*	*150*	*150*	*150*	*150*
New Ghubrah Desalination Plant (Planned)	*-*	*-*	*191*	*191*	*191*	*191*	*191*
Total Contracted Desalination Capacity	**549**	**554**	**695**	**695**	**695**	**695**	**461**
Reserve *or* (Shortfall/Groundwater Supply Required)	**(93)**	**(105)**	**(19)**	**-**	**(27)**	**(50)**	**(307)**
Prospective Contracted Capacity							
Barka I capacity addition	*-*	*45*	*45*	*45*	*45*	*45*	*45*
Barka I contract extension	*-*	*-*	*-*	*-*	*-*	*-*	*91*
New Suwayq Desalination Plant	*-*	*-*	*-*	*-*	*225*	*225*	*225*
New Qurayyat Desalination Plant	*-*	*-*	*-*	*-*	*-*	*-*	*180*
Total Prospective Capacity Contracts	**-**	**45**	**45**	**45**	**270**	**270**	**541**
Reserve *or* (Shortfall/Groundwater Supply Required)	**(93)**	**(60)**	**26**	**45**	**243**	**220**	**234**

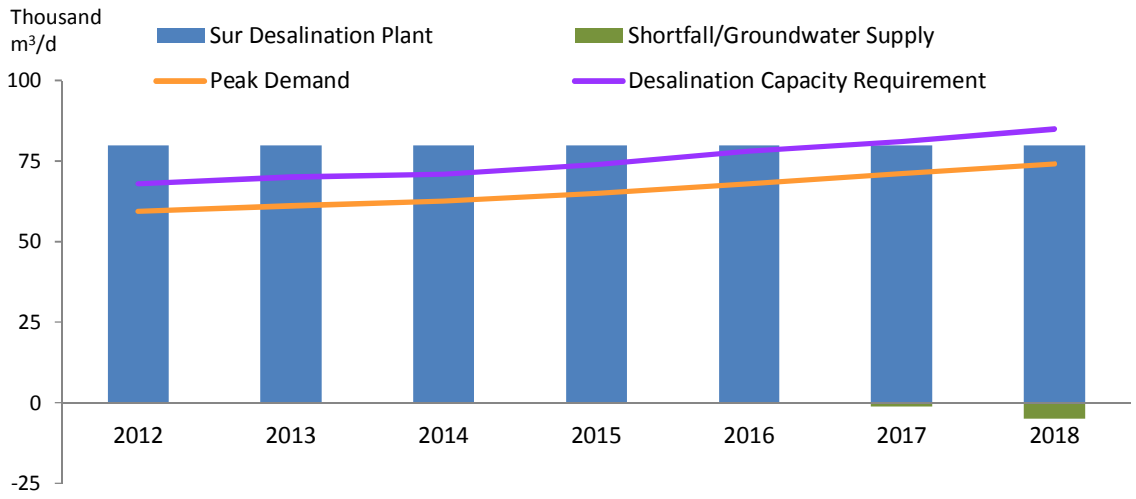
[a] PAEW sources include existing wells, the Wadi Dayqah surface reservoir, and surplus capacity from the MISC RO plant. The requirement for desalinated water from OPWP is the total water capacity requirement less PAEW sources.

Desalination Capacity Requirement – "Sur Zone"

The principal source of water for the "Sur Zone" is currently the existing Sur Desalination Plant, owned by Sharqiyah Desalination Company and operated under a water purchase agreement with PAEW. The Sur plant has a capacity of approximately 80,000 m^3/d (18 MIGD), using RO technology.

Figure 7 below provides a summary of the demand/supply balance in the "Sur Zone" during the 2012-2018 period. This indicates that the current desalination capacity at Sur will be sufficient to cover projected demands through 2017. However, a shortfall emerges in 2017, increasing to 5,000 m^3/d (1 MIGD) by 2018. Options are under consideration for additional desalination capacity to serve the "Sur Zone" in the 2017 time frame.

Figure 7 Desalination Capacity Reserve/Shortfall – "Sur Zone"



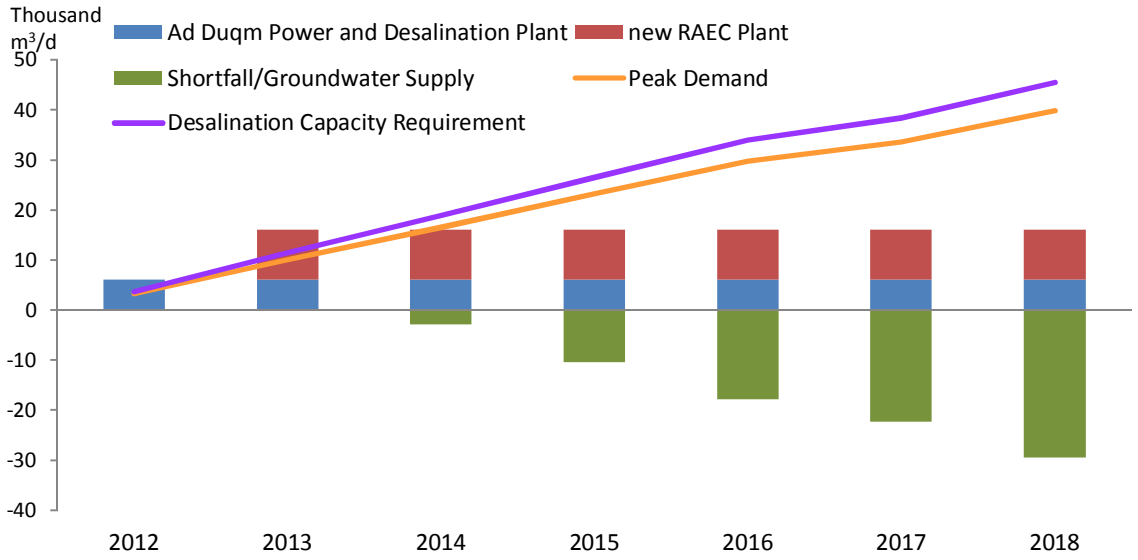
"Sur Zone"	2012	2013	2014	2015	2016	2017	2018
	thousand m^3/d						
Peak Water Demand	**59**	**61**	**63**	**65**	**68**	**71**	**74**
Desalination Capacity Requirement	**68**	**70**	**71**	**74**	**78**	**81**	**85**
Desalination Capacity	**80**	**80**	**80**	**80**	**80**	**80**	**80**
Sur Desalination Plant	*80*	*80*	*80*	*80*	*80*	*80*	*80*
Reserve *or* (Shortfall/Groundwater Supply Required)	**12**	**10**	**9**	**6**	**2**	**(1)**	**(5)**

Desalination Capacity Requirement – "Ad Duqm Zone"

The "Ad Duqm Zone" is currently served by a 6,000 m^3/d (1 MIGD) desalination plant in Ad Duqm, and a number of local water sources. Demand in this area is expected to increase rapidly in the coming years as a result of the Government's development plans, and new desalination capacity will be required if heavy

dependence on groundwater supplies is to be avoided. PAEW has requested RAEC to build a 10,000 m^3/d (2 MIGD) plant, and is making arrangements for additional temporary sources to meet near-term requirements for potable water. Figure 8 below provides an indication of the potential shortfalls in desalination capacity, which reach about 39,000 m^3/d (9 MIGD) by 2018.

Figure 8 Desalination Capacity Reserve/Shortfall – "Ad Duqm Zone"



	2012	2013	2014	2015	2016	2017	2018
"Ad Duqm Zone"	*thousand m^3/d*						
Peak Water Demand	**3**	**10**	**17**	**23**	**30**	**34**	**40**
Desalination Capacity Requirement	**4**	**11**	**19**	**27**	**34**	**38**	**45**
Desalination Capacity	**6**	**16**	**16**	**16**	**16**	**16**	**16**
Ad Duqm Desalination Plant	*6*	*6*	*6*	*6*	*6*	*6*	*6*
New RAEC Desalination Plant		*10*	*10*	*10*	*10*	*10*	*10*
Reserve *or* (Shortfall/Groundwater Supply Required)	**2**	**5**	**(3)**	**(11)**	**(18)**	**(22)**	**(29)**

1.5 COMBINING POWER GENERATION AND WATER DESALINATION

Introduction

In developing its plans for procuring power generation resources, OPWP is required to consider the opportunity for combining power generation with water desalination so as to benefit from economies of co-location and co-procurement. Most recently in the MIS, the Barka II Power and Desalination Plant involved the combined development of new power and desalination capacity.

Potential for Future Combined Power Generation and Desalination

As discussed in section 1.4 above, the main requirements for new desalination capacity over the 2012-2018 period are:

- 307,000 m^3/d (68 MGD) for the "Interconnected Zone" from 2017/2018;
- 5,000 m^3/d (1 MGD) for the "Sur Zone" in 2017/2018; and
- 29,000 m^3/d (6 MIGD) for the "Ad Duqm Zone" by 2018, although shortfalls are projected to emerge in the 2014/2015 time frame.

Toward procuring the new desalination capacity required from 2017/2018 for the "Interconnected Zone", OPWP will consider both combined power and water and water-only options. The need for additional power generation capacity in the same time frame provides an opportunity for a combined power and water plant. PAEW has requested sites for new desalination capacity at Qurayyat and Suwayq, and OPWP is evaluating these locations for both water-only and combined water and power plants. Consideration will also be given for the potential contract extension at Barka I, which will have considerable service life remaining on the expiration of its contract in 2018.

At the request of PAEW, OPWP intends to consider the potential for combining desalination with power generation capacity as part of its strategic review of options for the development of a power generation plant at Ad Duqm (as discussed in section 1.1). However, given the lead time associated with the development of any such power plant, this is only likely to represent a longer term option – the more immediate need for additional desalination capacity indicated by Figure 8 above (i.e., prior to 2016) will most likely need to be met on a water-only basis.

1.6 PROCUREMENT ACTIVITIES

OPWP's current procurement activities for the MIS are focused on temporary generation capacity for the summer of 2012, the tender for the new Ghubrah IWP, the potential addition to desalination capacity at Barka I, and assistance to RAEC with the procurement of a 120 MW IPP in Musandam Governorate (which is not connected to the MIS).

In addition, OPWP expects to commence during 2012 the procurement of the proposed solar plant(s) (subject to receiving a final go-ahead from the Government).

Future Procurement

Procurement activities in the next few years are expected to be driven by:

- The expiration of PPAs for existing plants that present attractive opportunities for renewal;
- the potential need for new power generation and water desalination capacity in the 2017-2018 timeframe, as described in section 1.3 above;
- the review of options, noted in section 1.1 above, relating to the development of a power generation plant at Ad Duqm, with or without interconnection with the MIS and/or other power systems; and
- consideration of a number of options to improve fuel-utilization efficiency in the MIS.

OPWP intends to commence detailed studies in 2012 to develop its strategy for the procurement of new capacity in the 2017-2018 timeframe. These studies will include consideration of feasible locations and fuel availability for new plant(s). Consideration will also be given to the impact of the expiry of existing P(W)PAs in the same timeframe, and the interaction between options for the development of new capacity and the renewal of P(W)PAs for existing capacity. The interaction between the Ad Duqm options and options for the MIS as a whole (in the context of Ad Duqm potentially being interconnected with the MIS) will also be considered.

At the same time, OPWP intends to study a number of options aimed primarily at improving overall fuel-efficiency in the MIS, including possible constraints on economic dispatch, and the development of renewable energy technologies in the generation portfolio. All of these options would likely involve the addition of relatively low amounts of capacity, at a relatively high cost per MW installed, but may be economically viable based on their ability to reduce overall fuel consumption in the MIS. In the event that OPWP's analysis indicates that any of these options is likely to be economically viable, then OPWP would look to develop an appropriate procurement process tailored to the relevant option.

Long-Term Strategy

OPWP intends to work closely with the Government over the coming year with regard to the development of longer-term strategy. This is expected to involve looking out beyond the 7-year horizon and mapping out a future vision for the power (and associated water) sector – including consideration of such issues as:

- fuel sources, diversity and security;
- the role of renewables and nuclear power as long-term supply alternatives;
- the role of conservation and demand side management; and
- the role of regional interconnects.

The aim of this work will be to establish a basis for the planning and procurement of future power generation (and associated water), consistent with the Government's broader economic strategy and policy objectives.

1.7 FUEL REQUIREMENTS

2011 Fuel Usage

The primary fuel resource for power generation and associated water production in the MIS is currently natural gas, supplied to power and desalination plants by the Ministry of Oil & Gas (MOG). Total gas consumption at the main power and desalination plants in 2011 was about 6.0 billion Sm^3 (equivalent to 16.3 million Sm^3/d), an increase of around 4% over 2010.[7] The peak daily gas consumption during 2011 was 21.8 million Sm^3, a slight reduction of 0.5% from 2010.[8]

[7] This total excludes gas consumed by industries and other parties.

[8] The 0.5% reduction in peak day gas consumption compares to the 10% increase in peak electricity demand. There were two leading causes of this unexpected result. Firstly, gas consumption was partly displaced by diesel fuel on the peak day of 2011 relative to 2010, as more diesel-fired temporary generation was utilized to meet peak demand. Secondly, Sohar Aluminium Co provided more energy on the peak day in 2011 than in 2010, and the gas consumed by Sohar Aluminium

A relatively small amount (about 6.9 million litres in total) of diesel fuel was used as the primary fuel for temporary generation facilities connected to the MIS in 2011 – in energy-equivalent terms, this represented only 0.1% of the total MIS fuel consumption.

Projected Fuel Requirements

OPWP has prepared indicative projections for the fuel requirements of the MIS over the 2012-2018 period, under the expected, "low case" and "high case" demand scenarios. These projections are based on a number of key assumptions, including:

- all generation other than the planned 2012 diesel-fueled temporary generation and the prospective solar plant(s) is assumed to be gas-fueled;
- solar plant(s) are assumed to provide around 50 MW on average over the daily cycle (representing about 1-2% of total MIS energy) from 2016 onwards; and
- new gas-fueled generation is assumed to have a similar fuel efficiency to the Sur plant.

The projections are shown in Figure 9 below.

Overall fuel consumption is expected to increase at an average rate of about 5% per year – lower than the expected growth rate of electricity demand of about 8% per year. Under the "low case" demand scenario, fuel consumption increases at an average of 3% per year, whilst in the "high case" demand scenario, it grows at an average rate of 8% per year – in both cases below the rate of growth of electricity demand.

The lower growth rates in fuel consumption relative to electricity demand are attributable to two main factors. Firstly, the full commissioning of the Sohar II and Barka III plants in 2013 and the Sur IPP in 2014 is expected to result in a significant improvement in overall gas utilization efficiency, based on these plants using newer, more fuel-efficient technology than existing plants – indeed, it can be seen that the addition of these plants is expected to *reduce* total fuel consumption in 2013, compared to the 2012 level, under the expected case demand scenario. And secondly, the assumed addition of the solar plant(s) in 2016 substitutes about 1-2% of MIS energy that would otherwise be generated using gas.

Gas Availability

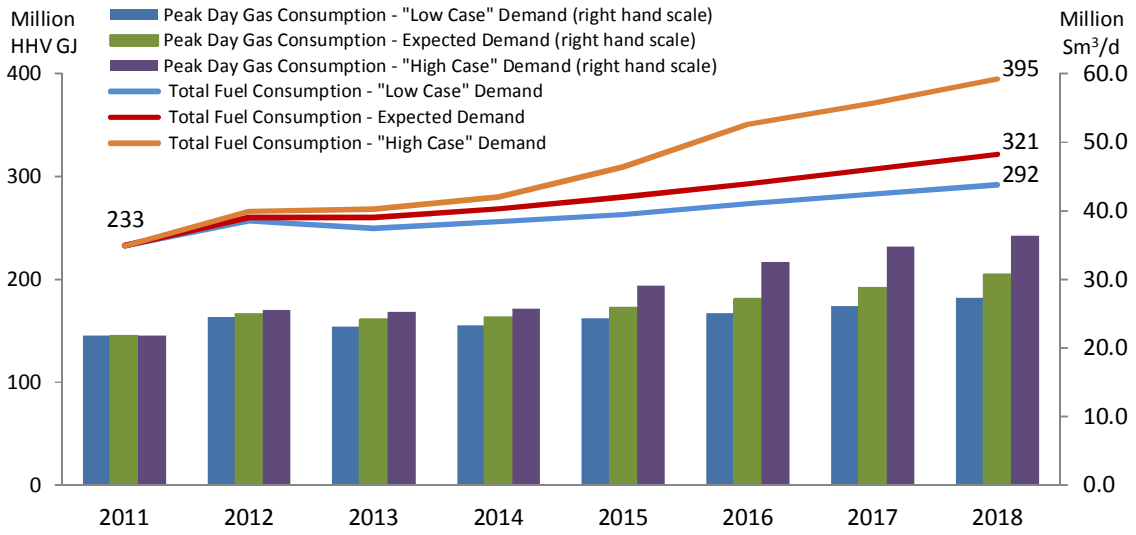
OPWP consults with MOG on a regular basis, in order to confirm the future availability of gas for power generation (and associated water production) and to co-ordinate planning.

MOG has provided OPWP with an overall medium-term committed gas allocation for power generation (and associated water production) that is expected to be sufficient to cover the projected requirements through 2018 under the "low case" scenario, through 2016 under the expected demand scenario, and through 2015 under the "high case" demand scenario.[9] Additional overall quantities, and supplies to new projects, remain subject to future MOG confirmation, though MOG has indicated that the power and water sector is, as a matter of Government policy, to be given a high priority in future gas allocations.

generators is not included in the numbers given above (which include only gas used by the main power and desalination plants).

[9] This overall reservation relates to the combined gas requirements of the MIS and the Salalah System.

Figure 9 Projected Fuel Requirements – MIS



	Actual 2011	2012	2013	2014	2015	2016	2017	2018	Ave.% Growth
Expected Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	16.3	18.2	18.2	18.8	19.6	20.5	21.5	22.6	5%
Peak Day	21.8	25.0	24.1	24.5	25.9	27.2	28.8	30.7	5%
Diesel Fuel Consumption (million litres)	6.9	-	-	-	-	-	-	-	n/a
Total Fuel Consumption (million HHV GJ)[a]	**233**	**260**	**260**	**268**	**280**	**293**	**307**	**321**	**5%**
Gas	*232*	*260*	*260*	*268*	*280*	*293*	*307*	*321*	5%
Diesel Fuel	*0.3*	-	-	-	-	-	-	-	n/a
"Low Case" Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	16.3	18.0	17.5	18.0	18.5	19.2	19.8	20.5	3%
Peak Day	21.8	24.4	23.1	23.3	24.3	25.1	26.1	27.3	3%
Diesel Fuel Consumption (million litres)	6.9	-	-	-	-	-	-	-	n/a
Total Fuel Consumption (million HHV GJ)[a]	**233**	**257**	**250**	**256**	**263**	**274**	**283**	**292**	**3%**
Gas	*232*	*257*	*250*	*256*	*263*	*274*	*283*	*292*	3%
Diesel Fuel	*0.3*	-	-	-	-	-	-	-	n/a
"High Case" Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	16.3	18.6	18.8	19.6	21.7	24.6	26.0	27.5	8%
Peak Day	21.8	25.5	25.2	25.7	29.1	32.5	34.7	36.4	8%
Diesel Fuel Consumption (million litres)	6.9	0.1	-	-	-	*0.4*	*10.3*	*59.4*	n/a
Total Fuel Consumption (million HHV GJ)[a]	**233**	**266**	**268**	**280**	**310**	**351**	**371**	**395**	**8%**
Gas	*232*	*266*	*268*	*280*	*310*	*351*	*371*	*392*	8%
Diesel Fuel	*0.3*	*0.0*	-	-	-	*0.0*	*0.4*	*2.2*	n/a

[a] *Based on natural gas HHV of 1050 BTU/scf*

However, should further required gas allocations not be available to the power and water sector, then (in addition to pursuing fuel-efficiency improvement options) OPWP would likely need to:

- make use of optional arrangements included in the Barka III and Sohar II PPAs for dispatch on liquid fuel instead of gas;
- discuss with the Government the feasibility of importing gas specifically for use in power generation (and associated water production); and/or
- bring forward plans to procure new generation capacity based on a fuel other than gas (possibly starting with new capacity potentially required in 2017).

OPWP will continue to consult closely with MOG with regard to all of these matters.

SECTION 2 SALALAH SYSTEM

The Salalah System covers the city of Salalah and surrounding areas in the Governorate of Dhofar, serving around 63,000 electricity customers.

It currently comprises an integrated generation, transmission and distribution system, owned and operated by Dhofar Power Co. (DPC) pursuant to a Concession Agreement signed with the Government in 2001, an independent generation facility owned and operated by Rural Areas Electricity Co. (RAEC), and a new independent power generation and water desalination facility (the Salalah IWPP). DPC acts as the sole electricity supplier within the service area covered by the system, supplying existing and new electricity customers.

The Salalah System currently operates as an isolated system. However, the commissioning of an interconnect with the power system of Petroleum Development Oman (PDO) is in process and is expected to be completed in 2012.

The Salalah IWPP represents a significant development for the system, providing a substantial increase in power generation capacity as well as (for the first time in Salalah) desalination capacity to meet the requirements of the Water Department of the Governorate of Dhofar. The first phase (61 MW) of the Salalah IWPP was completed in July 2011, and the second phase (173 MW) was completed in January 2012. The third phase is scheduled to be fully operational in April 2012, increasing production to 445 MW net, and desalination capacity of 68,190 cubic metres per day (15 MIGD) is expected to commence production in May 2012.

OPWP's role in the Salalah System is twofold. Firstly, it acts as counter-party to the Concession Agreement in place of the Government. And secondly, it performs a similar role as in the MIS, procuring additional power to meet the requirements of the electricity supplier (that are not covered by its own generation) and, wherever beneficial, co-procuring desalinated water to meet the needs of the water department. A process is underway to restructure DPC and the delivery of power in the Governorate of Dhofar to align with the regulatory structure that governs the MIS. As this proceeds, OPWP will ultimately have the same role in the Salalah System as it has in the MIS.

2.1 DEMAND FOR ELECTRICITY

Historical Demand

Electricity demand growth in the Salalah System was well below expectations in 2011. Average demand increased 6% on the year, to 228 MW (corresponding to 2.00 TWh). The peak demand was 348 MW.[10] This was nominally an increase of 2% over the 2010 recorded peak demand, though this represents an estimate due to comparability issues related to demand management measures at the peak time in 2010.[11] The modest growth in 2011 came as a surprise, as DPC received a record number of connection applications in 2010, particularly from large commercial and industrial customers, and had therefore projected strong demand growth. DPC conducted a review of their 2011 demand forecast and the actual out-turn, and found that a

[10] DPC reported a 2011 peak Salalah System demand of 348 MW at 1:01 am on Tuesday, May 31.

[11] DPC reported the Salalah System peak demand as 342 MW in 2010, which is an estimate that takes into consideration demand management and load shedding. This is a revised figure relative to that reported in the last 7-Year Statement, which was 356 MW.

larger-than-normal share of investors had decided to delay their investment commitments, relative to their plans evident in connection applications.

As with the MIS, it is informative to look at medium-term trends, abstracting from the impact of weather or other special factors that can affect demand growth in any particular year. Considering the period 2001 to 2011, while year-to-year growth in peak demand has been volatile, ranging from less than 1% up to 17% for individual years, the "moving average" on both five-year and ten-year periods has been stable in the range of 8-10% since 2006.

Demand Projections

OPWP's 7-year electricity demand projections for the Salalah System have been developed after consultation with DPC and other relevant entities.

The projections have been developed in a similar manner as for the MIS; in particular:

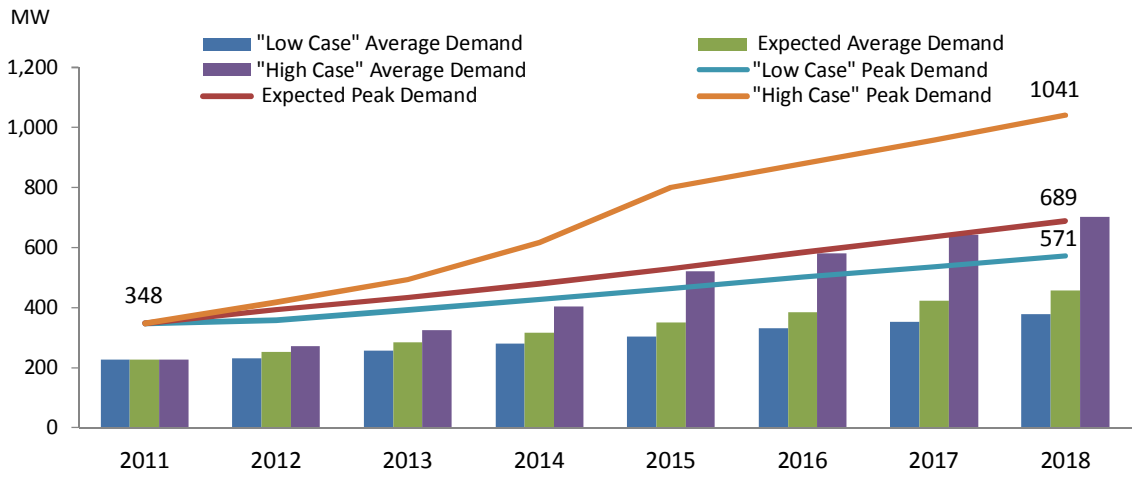
- they cover both average demand (i.e. energy) and peak demand;
- the projected demands represent the "net system demand", in that they are inclusive of assumed transmission and distribution system losses but exclude the internal auxiliary consumption of power and desalination plants;
- the projected demands are based on an assumption of "normal" weather;
- the projections are built up from separate analyses of underlying demand, and certain bulk loads – comprising mainly industrial demands – that are assessed on a specific load-wise basis[12]; and
- the projections are presented as a range with a "low case", a "high case" and a central, expected demand forecast.

As in the MIS, the principal drivers of underlying demand are residential and service sector (including government and private sector) demands – arising from continuing growth of population and the number of households, and general economic development and new construction. And also as in the MIS, the growth in demand from bulk loads is driven primarily by industrial consumers – in the case of the Salalah System, concentrated in particular around the Salalah Free Zone (SFZ). However, in contrast to the MIS, Salalah projects a surge in industrial development over the coming years that would push electricity demand growth at least to the upper end of its historical average, and well beyond that by some estimates.

The projections are summarized in Figure 10 below.

[12] For the Salalah System, individual loads connected (or expected to be connected) to the transmission and distribution system at 33 kV or above are regarded as bulk loads for purposes of the projections.

Figure 10 Electricity Demand Projections – Salalah System



	Actual 2011	2012	2013	2014	2015	2016	2017	2018	Ave.% Growth
Expected Demand									
Average Demand (MW)	228	254	283	315	349	386	423	458	10%
Underlying Demand	174	180	196	214	233	254	277	302	8%
Bulk Loads	54	74	86	101	116	132	146	157	16%
Annual Energy (TWh)	2.00	2.23	2.47	2.76	3.06	3.39	3.70	4.02	10%
Peak Demand (MW)	348	394	433	480	531	584	636	689	10%
Change from 2011-2017 Statement (MW)	*-67*	*-77*	*-104*	*-117*	*-107*	*-94*	*-83*	*n/a*	
"Low Case" Demand									
Average Demand (MW)	228	230	256	280	304	331	354	378	7%
Underlying Demand	174	176	189	202	216	231	247	265	6%
Bulk Loads	54	54	68	78	88	99	107	114	11%
Annual Energy (TWh)	2.00	2.02	2.25	2.45	2.66	2.91	3.10	3.31	7%
Peak Demand (MW)	348	358	391	427	463	502	536	571	7%
Change from 2011-2017 Statement (MW)	*-44*	*-76*	*-85*	*-83*	*-80*	*-67*	*-62*	*n/a*	
"High Case" Demand									
Average Demand (MW)	228	271	325	403	522	581	642	702	17%
Underlying Demand	174	183	204	226	251	278	309	343	10%
Bulk Loads	54	87	122	177	271	302	333	359	31%
Annual Energy (TWh)	2.00	2.38	2.85	3.53	4.57	5.10	5.62	6.15	17%
Peak Demand (MW)	348	418	494	616	801	879	959	1041	17%
Change from 2011-2017 Statement (MW)	*-76*	*-92*	*-220*	*-157*	*-26*	*7*	*41*	*n/a*	

Under the central forecast, average demand in the Salalah System is expected to grow from 228 MW (corresponding to 2.00 TWh) in 2011 to 458 MW (4.02 TWh) in 2018, an average increase of around 10% per year. Similarly, peak demand is expected to grow at an average rate of about 10% per year, from 348 MW in 2011 to 689 MW in 2018. These growth rates are around 2 percentage points higher than those projected for the MIS, driven in particular by the high growth rate in bulk (primarily industrial) loads.

Over the 7-year horizon, this scenario presents a view that the average growth rate over the entire period is only marginally changed compared to OPWP's 2011-2017 7-Year Statement: the growth rate for both average demand and peak demand drops slightly to 10% from 11%.

The 2011 data presented conflicting indications for demand development: (1) demand growth from 2010 to 2011 was modest and well below forecast, and (2) there remains a record number of customer applications for new industrial connections in the SFZ. The new forecast takes the view that the weak realization of expected growth in 2011 represents a delay in new project starts rather than a trend of diminished growth expectations. A study sponsored by DPC confirmed the extent of industrial development plans and their power requirements in the SFZ, yet also cautioned that relatively few of the planned projects showed evidence of significant investment commitments as of the third quarter of 2011. For this reason, the current forecast projects new industrial demand to develop more slowly, providing a steadier year-to-year growth rate over the entire 7-year period, whereas the previous forecast included a rapid initial development followed by a tapering off in the latter years.

Under the "low case" scenario, the medium-term growth rate of both average and peak demands is reduced to around 7% per year, slightly lower than in the "low case" presented a year ago. This scenario considers the prospect that the low growth shown in 2011 indicates an investment slowdown that will take longer to overcome, perhaps due to caution about the global economic situation.

The "high case" scenario shows elevated growth rates driven in particular by a significant build-up in large industrial loads – and with an unusually large step up in demand in 2014-15 when one prospective industrial customer with a demand of 150 MW could potentially be added to the system. This scenario, at 17% average growth in both average and peak demand, follows a more aggressive growth trend compared to the "high case" in last year's 7-Year Statement (16% growth in average demand, 14% growth in peak demand). The increase is supported by the 2011 DPC-sponsored study of industrial customer applications.

As in the case of the MIS, the "low case" and "high case" scenarios are intended to represent the range of reasonably credible future demand paths around the expected demand projection, against which the requirements for generation resources need to be assessed and an appropriate generation procurement strategy developed.

Exports to Interconnected Systems

The Salalah System currently operates as an isolated system, but an interconnection with the PDO power system (via a 132 kV link between Thumrait and Harweel) was completed in 2011 and is expected to be fully operational in 2012. This interconnection provides important reliability benefits through the sharing of generation reserves.

This interconnection may in the future provide the opportunity for the "commercial" export of power to the PDO System, which would add to the expected demand to be served by generation resources in the Salalah System. For the time being, no definite arrangements have been agreed for commercial exports to the PDO System, and accordingly the current Salalah System demand projections (presented above) include the native demands of the Salalah System only.

However, OPWP intends to consider the potential for economic benefits from commercial exports from the Salalah System to the PDO System – and the consequent impact on total demand – in conjunction with the development of its medium term generation procurement strategy for the Salalah System (discussed further below).

2.2 POWER GENERATION RESOURCES

Contracted Capacity

Demand for electricity in the Salalah System was met in 2011 by a combination of the following power generation resources:

- the gas-fired Raysut New Power Station, operated by DPC pursuant to the Concession Agreement;
- the Raysut A&B diesel power plants, operated by RAEC and sold to OPWP under a PPA;
- the Salalah IWPP, operated under a PWPA with OPWP; and
- rental General Electric gas turbines, procured by DPC pursuant to an amendment to the Concession Agreement with OPWP that terminated in November 2011.

These resources are regarded as analogous to the "contracted capacity" in the MIS.

The Raysut New Power Station comprises eight permanent OCGT units with a total net capacity of 256 MW, which are planned to remain operational until at least 2023 (the expiry date of the Concession Agreement). There had been three temporary OCGT units operating at the same location from June 2010 until November 2011, and they have been decommissioned as they are no longer needed given the availability of the Salalah IWPP.

The Raysut A&B diesel power plants comprise twelve diesel engine units with a total net contracted capacity of 55 MW. These units are planned to be de-commissioned in 2012, after the Salalah IWPP is fully commissioned.

The Salalah IWPP is being developed on a phased basis under a 15-year PWPA with OPWP. The first phase of 61 MW generation capacity was commissioned in July 2011 and the second phase of 173 MW in January 2012. With the commissioning of the third phase scheduled for April 2012, the Salalah IWPP will have a net power generation capacity of 445 MW.

The rental GE turbines, comprising open-cycle gas-fired units, were procured by DPC for OPWP as temporary generation for the period from May 2010 to November 2011, and were decommissioned on expiration of the contract.

Non-Firm Resources under Contract

Final commissioning of an interconnection with the PDO Power System (via a 132 kV link between Thumrait and Harweel) is expected to be complete in the first quarter of 2012. The main purpose of this interconnect is to support a reserve sharing arrangement between the Salalah System and the PDO system, providing improved reliability in both systems by allowing each system access to unused reserve in the other system in contingency scenarios. Thus, subject to the availability of surplus generation in the PDO system at the time required, support can be provided to the Salalah System to help manage contingencies.

In addition to supporting reserve sharing arrangements, the interconnection potentially supports "commercial" imports or exports between the two systems – based on their relative costs of generation. After the Salalah IWPP is fully commissioned, and looking ahead to potential future additions of highly efficient, combined cycle plant in the Salalah System, it may be beneficial to export power to the PDO system.

The nominal transfer capacity of the interconnection is around 150 MW, but the availability of import power for the Salalah System is more likely in practice to be limited by generation availability and upstream transmission constraints in the PDO system. These factors will be reviewed in consultation with PDO on a year to year basis. Currently, it is expected that up to around 100 MW of import capability is available to the Salalah System.

Whilst expected to provide valuable contingency support, and a potential source of economical energy in the short-term, the import capability of the interconnection is not considered to represent "contracted capacity" for resource adequacy purposes (such as LOLH calculations).

Prospective Resources

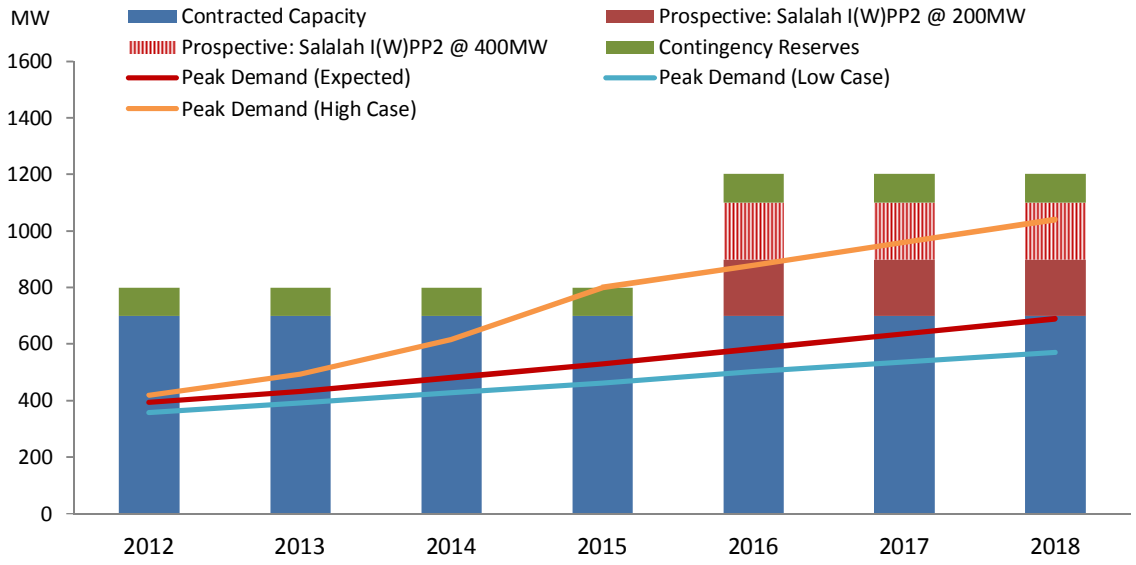
OPWP is presently in discussions to select a site for a second I(W)PP in Salalah with 200-400 MW of generation capacity (the Salalah I(W)PP2). The tender is expected to be issued in 2012 with a projected plant commissioning date of 2016.

The Salalah generation expansion study also considered renewable energy options. The screening-level analysis performed on candidate power sources concluded that, while the CCGT plant noted above should proceed to procurement, the potential development of wind farms at Thumrait is worth more-detailed examination. This study considered the development of a 20 MW wind farm.

Summary

Figure 11 below provides a summary of the currently contracted capacity, prospective contracted capacity, and contingency reserves that OPWP expects to have access to for the Salalah System.

Figure 11 Total Power Generation Resources – Salalah System



	2012	2013	2014	2015	2016	2017	2018
				Net MW [a]			
Contracted Capacity							
Raysut New Power Station	256	256	256	256	256	256	256
Salalah IWPP	445	445	445	445	445	445	445
Prospective Capacity Contracts							
new Salalah I(W)PP2	-	-	-	-	200-400	200-400	200-400
Total – Contracted + Prospective Capacity	**701**	**701**	**701**	**701**	**901-1101**	**901-1101**	**901-1101**
Contingency Reserves							
PDO Interconnect[b]	100	100	100	100	100	100	100
TOTAL ALL RESOURCES	**801**	**801**	**801**	**801**	**1001-1201**	**1001-1201**	**1001-1201**

[a] *all capacities are rated on a net basis (i.e. after allowing for auxiliary consumption inside the plants) at 35°C ambient temperature*
[b] *provisional import capability*

2.3 ADDITIONAL POWER GENERATION REQUIREMENTS

Statutory and Regulatory Requirements

With the acquisition by the Electricity Holding Company during 2011 of substantially all of the shares in the Dhofar Power Company (DPC) and the delisting of DPC from the Muscat Securities Market, a process is underway to restructure DPC and the delivery of power in the Governorate of Dhofar. A Ministerial Committee comprising representatives from the Public Authority for Electricity & Water and the Authority for Electricity Regulation has been formed to oversee this restructure. During 2012 it is expected that the Salalah Concession Agreement between DPC and OPWP will be terminated and replaced by a power purchase agreement in

respect of the NPS as a part of the DPC restructuring proposals which will ultimately bring the management of electricity in the Governorate of Dhofar into line with the regulatory structure which governs the MIS.

As in relation to the MIS, OPWP is required by the Sector Law and its license to ensure the adequacy of generation resources in the Salalah System to meet future power demands. The Sector Law establishes OPWP's general responsibility to secure sufficient generation resources to meet demand. And whilst OPWP's license does not stipulate a specific generation security standard for the Salalah System, as it does for the MIS, it does require that OPWP ensure that electricity customers in the Salalah System receive a service generally of equivalent quality to that received by customers in the MIS.

This latter requirement means that, as a minimum, the MIS standard of 24 hours LOLH needs to be complied with. However, given the more limited level of contingency support available to the Salalah System, compared to the case for the MIS, OPWP has in practice sought to apply a somewhat more stringent standard, to ensure the required service quality.

Future Capacity Requirements

OPWP has calculated the approximate amounts of contracted capacity it would require to comply with the security standard in each year during the 2012-2018 period, in the context of the three scenarios for demand projection as described above (i.e. expected demand, "low case" and "high case").[13] The approximate requirements are shown in Figure 12 below.

It can be seen that the need for additional capacity is highly dependent on the path of demand. The expected case demand scenario indicates that additional capacity may not be required until 2018. The "low case" implies a capacity surplus through 2018: currently contracted capacity is sufficient.

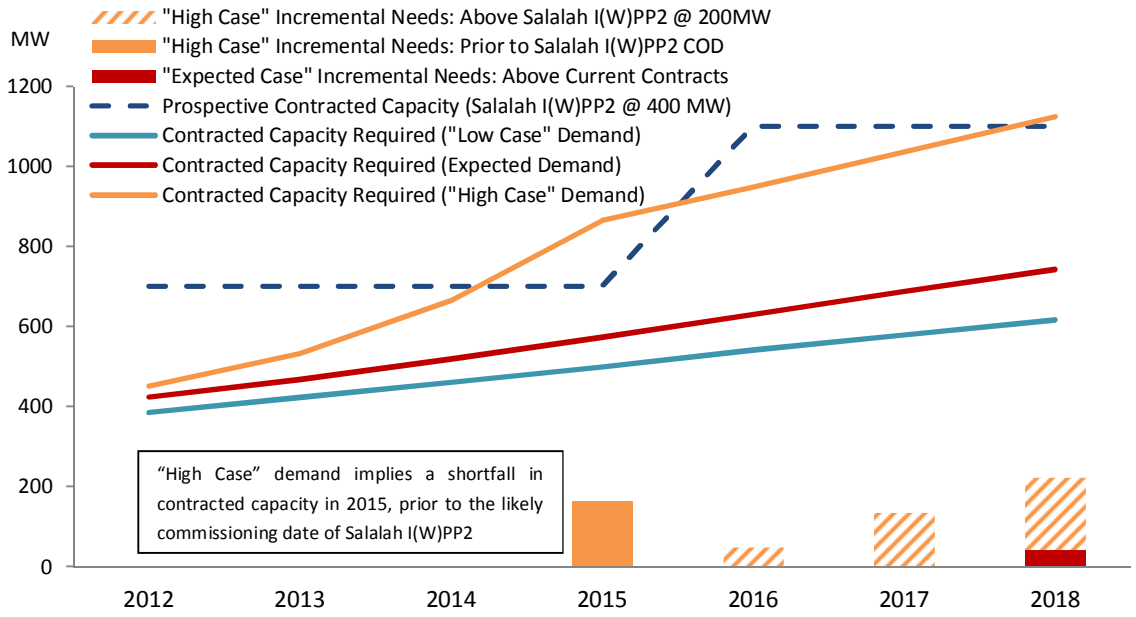
Under the "high case" scenario, additional capacity is required as early as 2015. This date is too soon for the requirement to be met by the planned Salalah I(W)PP2 unless the plant is procured with an early power phase, but could be met by temporary generation, perhaps supplemented by imports from the PDO system during the summer peak.

Given commercial operation of Salalah I(W)PP2 in 2016, before the summer peak, incremental capacity needs depend on the plant's generation capacity. If the Salalah I(W)PP2 is sized at 200 MW, there may still be unmet demand in 2016 and 2017, but in quantities that could be met by temporary generation, and then another plant of the same or larger size would be required in 2018. The 200 MW option for Salalah I(W)PP2 is considered as a risk mitigation measure, given the relatively low probability that the "high case" will transpire and considering that demand growth in this scenario is considerably higher than historical averages. Alternatively, if sized at 400 MW, there would be no need for interim temporary generation during 2016-2017 and the next major plant could be deferred until after 2018.

The "high case" demand scenario underscores the importance of managing risk in OPWP's commitments to contracting for new capacity. As a further measure to manage the uncertainty in demand development, OPWP intends to follow closely the status of plans and commitments for development in the Salalah Free Zone.

[13] Such calculations are necessarily approximate as the LOLH depends to some extent on the exact nature (e.g. type and size) of the generation capacity, which is not known with certainty in respect of future capacity.

Figure 12 Future Power Generation Capacity Requirements – Salalah System



	2012	2013	2014	2015	2016	2017	2018
				Net MW			
Expected Demand							
Peak Demand	394	433	480	531	584	636	689
Contracted Capacity Required	425	468	519	573	630	687	744
Incremental Capacity Needed:							
Above Currently Contracts	-	-	-	-	-	-	43
Above Prospective Contracts (Salalah I(W)PP2 @ 200 MW)	-	-	-	-	-	-	-
"Low Case" Demand							
Peak Demand	358	391	427	463	502	536	571
Contracted Capacity Required	386	422	461	500	542	579	617
Incremental Capacity Needed:							
Above Current Contracts	-	-	-	-	-	-	-
Above Prospective Contracts (Salalah I(W)PP2 @ 200 MW)	-	-	-	-	-	-	-
"High Case" Demand							
Peak Demand	418	494	616	801	879	959	1041
Contracted Capacity Required	452	533	665	865	950	1036	1124
Incremental Capacity Needed:							
Above Currently Contracts	-	-	-	164	249	335	423
Above Prospective Contracts (Salalah I(W)PP2 @ 200 MW)	-	-	-	164	49	135	223
Above Prospective Contracts (Salalah I(W)PP2 @ 400 MW)	-	-	-	164	-	-	23
Above All Resources Available	-	-	-	64	-	-	-

2.4 DESALINATED WATER REQUIREMENTS

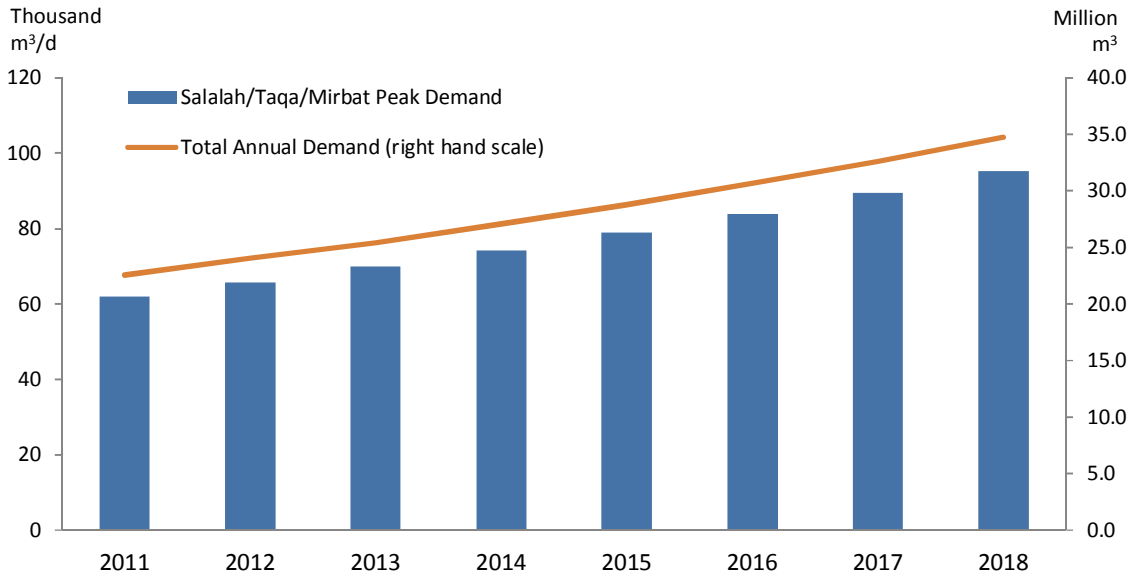
Demand for Water

Water demand projections for the Governorate of Dhofar have been provided to OPWP by the Directorate General of Water in the Office of the Minister of State and Governor of Dhofar (DGW).

DGW has advised OPWP that the relevant demands for supply of desalinated water are the aggregated potable water demands of the Salalah, Taqa and Mirbat wilayats.[14] DGW has provided projections of these water demands for 2012 to 2018 in terms of peak demand and average daily demand, as shown in Figure 13 below.

Over the 7-year horizon, water demand in the Salalah/Taqa/Mirbat area is expected to increase at an average rate of around 6% per year, somewhat higher than the overall growth rate expected in the other main supply areas in the Sultanate (as shown in Figure 13). As in the other supply areas, the main growth drivers are increasing population, economic development and the continuing build out of water supply networks – moderated to some extent by loss reduction efforts.

Figure 13 Water Demand Projections – Dhofar (Salalah/Taqa/Mirbat)



	Actual 2011	2012	2013	2014	2015	2016	2017	2018	Ave.% Growth
Peak Water Demand					*thousand m^3/d*				
Total Salalah/Taqa/Mirbat	**62**	**66**	**70**	**74**	**79**	**84**	**89**	**95**	**6%**
Change from 2011-2017 Statement	*-40*	*-44*	*-49*	*-58*	*-62*	*-62*	*-64*	*n/a*	
Total Annual Demand					*million m^3*				
Total Salalah/Taqa/Mirbat	**22.6**	**24.0**	**25.5**	**27.0**	**28.8**	**30.7**	**32.6**	**34.7**	**6%**
Change from 2011-2017 Statement	*-11*	*-12*	*-14*	*-17*	*-18*	*-18*	*-18*	*n/a*	

[14] Other demands in the Governorate of Dhofar are expected to be served from local supply sources.

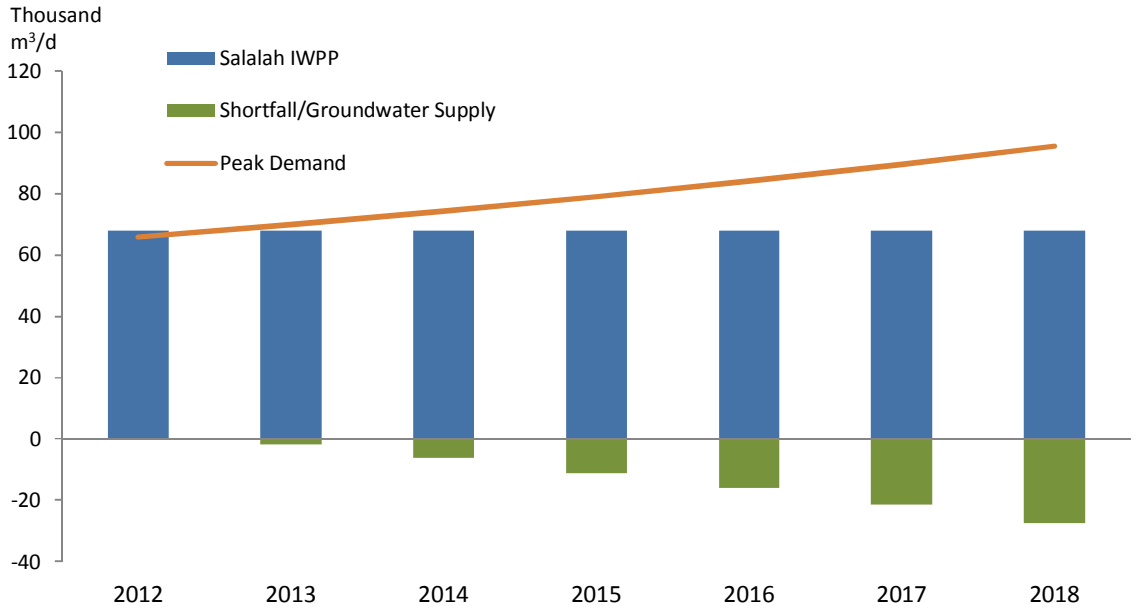
The current projections show a reduction by about one-third from those included in OPWP's 2011-2017 7-Year Statement. This reduction is due to a downward adjustment in 2010 water demand by DGW, revising an estimated value with the actual value, which then provided the basis for their projection to 2018.

Desalination Capacity Requirement

Demands for potable water in the Salalah/Taqa/Mirbat area have been met exclusively from groundwater resources before the introduction of the Salalah IWPP. Full commissioning of the water desalination plant is expected in the first half of 2012 once the connection to the water network is completed. The Salalah IWPP has a desalination capacity of 68,190 m^3/d (15 MIGD), using RO technology.

Figure 14 below provides a summary of the demand/supply balance. This indicates that, without additional desalination capacity, DGW will again be dependent on groundwater resources to meet an increasing share of its water requirements from 2013 onwards.

Figure 14 Desalination Capacity Reserve/Shortfall – Dhofar (Salalah/Taqa/Mirbat)



	2012	2013	2014	2015	2016	2017	2018
	thousand m^3/d						
Peak Water Demand	**66**	**70**	**74**	**79**	**84**	**89**	**95**
Desalination Capacity	**68**	**68**	**68**	**68**	**68**	**68**	**68**
Salalah IWPP	*68*	*68*	*68*	*68*	*68*	*68*	*68*
Reserve *or* (Shortfall/Groundwater Supply Required)	**2**	**(2)**	**(6)**	**(11)**	**(16)**	**(21)**	**(27)**

DGW has advised OPWP that its medium-term objective is to minimize the use of groundwater under normal circumstances and reserve groundwater resources for contingency purposes. This would indicate that at least 27,000 m^3/d (6 MIGD) of additional desalination capacity is likely to be required by 2018.

2.5 COMBINING POWER GENERATION AND WATER DESALINATION

As in the MIS, OPWP is required to consider the opportunity for combining power generation with water desalination in the Salalah System, so as to benefit from economies of co-location and co-procurement. An assessment of these potential benefits led to the decision by OPWP to proceed with the Salalah IWPP – the first combined power and desalination plant to be developed in the Salalah System.

As discussed in section 2.3 above, OPWP has initiated the site selection process for a new addition of power capacity in the Salalah System around 2016; the procurement is expected to be launched in 2012. And as discussed in section 2.4, based on the needs advised to OPWP by DGW, there is potential requirement for at least 27,000 m^3/d (6 MIGD) of additional desalination capacity by 2018.

Accordingly, OPWP is evaluating the potential for combining the required power and desalination capacities. In 2011, OPWP completed a study that recommended selection of RO technology for the next water desalination plant, on the basis of economic benefits. Consequently, it is not necessary to site the power generation and desalination plants at the same location, although there may be economies of co-location due to site infrastructure, and economies of co-procurement. A decision will be made in consultation with DGW in 2012 with regard to the inclusion of desalination capacity in any competitive process for new power generation capacity initiated by OPWP.

If it is decided not to combine the procurement of desalination capacity with new power generation capacity, then possible alternatives would include stand-alone desalination capacity procured by DGW (or OPWP on DGW's behalf).

2.6 PROCUREMENT ACTIVITIES

Current Projects

OPWP does not plan to procure temporary generation for the summer of 2012. However, as a contingency plan to address a potential delay in Salalah IWPP commissioning, OPWP is in discussion with RAEC about potentially providing backup utilizing the existing Raysut diesel generators.

As indicated above, OPWP has initiated the site selection process for Salalah I(W)PP2 and expects to issue the tender in the second half of 2012, which may go forward as an IWPP or as separate IPP and IWP tenders.

Future Procurement

OPWP is considering the optimal capacity for Salalah I(W)PP2 in the range of 200-400 MW to mitigate risk in demand development, and will select a capacity specification later in 2012. If the plant is tendered at 200 MW and demand develops along the "high case" scenario, then a feasible amount of temporary generation may be required during the 2016-2017 period and a third Salalah I(W)PP may be required in 2018. If the Salalah I(W)PP2 is tendered at 400 MW, then the next procurement of a major plant could be delayed until after 2018.

In addition, OPWP's 2011 power generation expansion study indicated that wind farms located at Thumrait show potential as a resource option, though possibly requiring a subsidy. The screening study considered a 20 MW wind farm, and recommended a more detailed analysis. Although this capacity may not strictly be required to meet requirements in the Salalah System depending upon the demand scenario, this project would progress Government initiatives to encourage renewable energy development. OPWP plans to explore this further, which may lead to procurement within the next seven years.

2.7 FUEL REQUIREMENTS

2011 Fuel Usage

The primary fuel resources for power generation in the Salalah System were natural gas, supplied to the Raysut New Power Station, Salalah IWPP and rental GE units by MOG, and petroleum diesel delivered by road tankers to the Raysut A&B plants.

Total gas consumption in 2011 was about 0.66 billion Sm^3 (equivalent to 1.8 million Sm^3/d), an increase of around 9% over 2010. This exceeded the 5% increase in electricity generation, and reflects the operation of the first phase of the new, gas-fueled Salalah IWPP in the second half of the year. The peak daily gas consumption during 2011 fell by 1% to 2.1 million Sm^3, relative to 2010. This reflects the modest growth in peak electricity demand, and somewhat more intensive operation of the Raysut diesel units during the peak period.

Total diesel fuel consumption in 2011 was about 7 million litres, a reduction of around 65% compared to 2010. This reflected significantly reduced utilization of the Raysut A&B plants over the year, made possible upon commissioning of the Salalah IWPP Phase 1. Diesel fuel represented about 1% of overall annual fuel usage in energy-equivalent terms.

On an overall energy-equivalent basis, total fuel consumption increased by 7% in 2011.

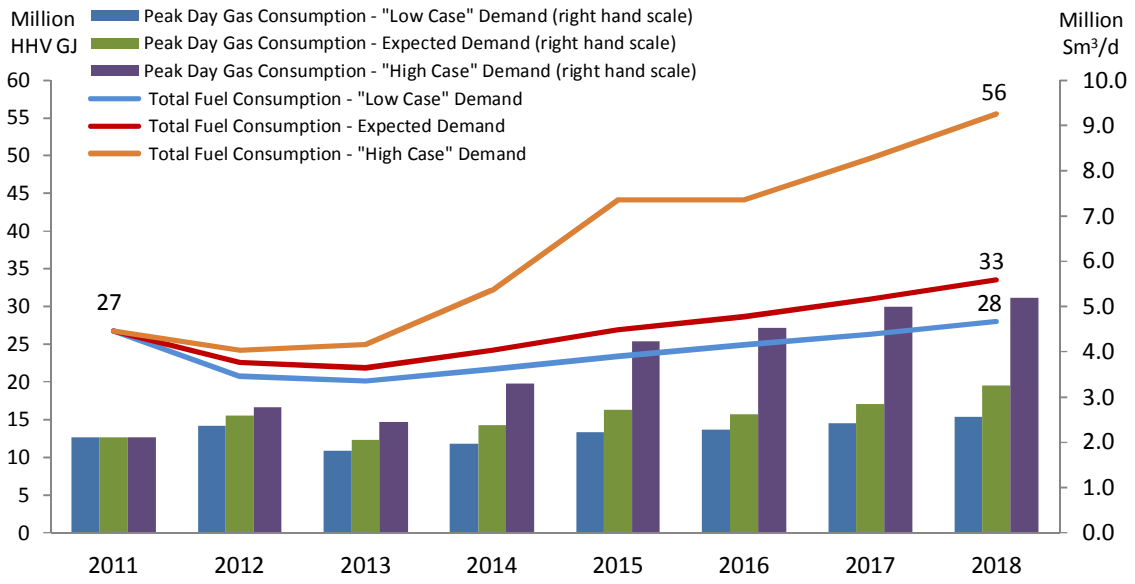
Projected Fuel Requirements

OPWP has prepared indicative projections for the fuel requirements of the Salalah System over the 2012-2018 period, under the expected, "low case" and "high case" demand scenarios. These projections are based on a number of key assumptions, including:

- new gas-fueled generation is assumed to be added in 2016, with a similar fuel efficiency to the Salalah IWPP;
- any generation shortfalls arising between 2015 and 2018 (anticipated under the "high case" demand scenario only) are met by diesel-fueled temporary generation; and
- the impact of potential "commercial" imports and/or exports over the PDO interconnection has not been included at this stage – to the extent that these ultimately take place then the projected quantities of diesel required may be reduced (if these requirements can be substituted with imported power) and/or the projected quantities of gas required may be increased by power exports (though this increase would likely be more than offset by reduced gas consumption within the PDO system).

The projections are shown in Figure 15 below.

Figure 15 Projected Fuel Requirements – Salalah System



	Actual 2011	2012	2013	2014	2015	2016	2017	2018	*Ave.% Growth*
Expected Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	1.8	1.6	1.5	1.7	1.9	2.0	2.2	2.3	4%
Peak Day	2.1	2.6	2.1	2.4	2.7	2.6	2.9	3.3	6%
Diesel Fuel Consumption (million litres)	7	-	-	-	-	-	-	-	n/a
Total Fuel Consumption (million HHV GJ)[a]	**26**	**23**	**22**	**24**	**27**	**29**	**31**	**33**	**4%**
Gas	*26*	*23*	*22*	*24*	*27*	*29*	*31*	*33*	4%
Diesel Fuel	*0.3*	-	-	-	-	-	-	-	n/a
"Low Case" Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	1.8	1.5	1.4	1.5	1.6	1.7	1.8	2.0	*1%*
Peak Day	2.1	2.4	1.8	2.0	2.2	2.3	2.4	2.6	*3%*
Diesel Fuel Consumption (million litres)	7	-	-	-	-	-	-	-	*n/a*
Total Fuel Consumption (million HHV GJ)[a]	**26**	**21**	**20**	**22**	**23**	**25**	**26**	**28**	***1%***
Gas	*26*	*21*	*20*	*22*	*23*	*25*	*26*	*28*	*1%*
Diesel Fuel	*0.3*	-	-	-	-	-	-	-	*n/a*
"High Case" Demand									
Gas Consumption (million Sm^3/d)									
Annual Average	1.8	1.7	1.8	2.3	3.1	3.1	3.5	3.9	12%
Peak Day	2.1	2.8	2.5	3.3	4.2	4.5	5.0	5.2	14%
Diesel Fuel Consumption (million litres)	7	-	-	-	*4.1*	*0.01*	*0.7*	*5.9*	n/a
Total Fuel Consumption (million HHV GJ)[a]	**26**	**24**	**25**	**32**	**44**	**44**	**50**	**56**	**11%**
Gas	*26*	*24*	*25*	*32*	*44*	*44*	*50*	*55*	12%
Diesel Fuel	*0.3*	-	-	-	*0.2*	*0.0*	*0.0*	*0.2*	n/a

[a] Based on natural gas HHV of 1050 BTU/scf

Under the current projections, overall fuel consumption is expected to increase at an average rate of about 4% per year – substantially lower than the expected growth rate of electricity demand of about 10% per year. Under the "low case" demand scenario, fuel consumption increases at an average of 1% per year, whilst in the "high case" demand scenario, it grows at an average rate of 11% per year – in both cases below the rate of growth of electricity demand.

The lower growth rates in fuel consumption relative to electricity demand are mainly attributable to the addition of the Salalah IWPP – the first CCGT plant in the Salalah System. The addition of this plant will result in a significant improvement in the overall fuel efficiency of the system, and is expected to *reduce* total fuel consumption in 2012, compared to the 2011 level, under all. The addition of the Salalah I(W)PP2 in 2016 makes further efficiency improvements, which are particularly evident in the "high case" demand scenario.

Diesel fuel consumption falls off to negligible amounts from 2012 onwards, except under the "high case" demand scenario, in which diesel-fired temporary generation returns in 2015 and later in the forecast, though at much reduced levels compared to those experienced in 2010 or 2011.

Gas Availability

As mentioned in section 1.7 above, OPWP consults with MOG on a regular basis, in order to confirm the future availability of gas for power generation (and associated water production) and to co-ordinate planning.

OPWP intends to consult in particular with MOG regarding the availability of gas to support the optimal generation procurement strategy for Salalah, particularly given the uncertainty in demand growth. This is likely to involve consideration of the total gas requirements of the Salalah System over the medium term – viewed in the context of the overall combined requirements of the MIS and the Salalah System – as well as the potential provision of supplies for new plant(s) in the Salalah System from 2016 onwards.