

# Projections of the future power and water system in Abu Dhabi

Pöyry Management Consulting provides the definitive report on the Abu Dhabi power and water system

## ABOUT PÖYRY

Pöyry is an international consulting company and a leading advisor to the world's energy sector. We deliver strategic advisory and analysis services to clients across the globe. Our team of 200 specialists, located across 16 offices offers unparalleled expertise in the rapidly changing energy sector.

We are the leading source of independent market projections. Our market projections are widely sought and respected by investors. They are used by project developers and financial institutions to assess potential new power projects and plant acquisitions.

Since 2008, Pöyry has advised over 150GW of transactions across Europe and MENA with a value in excess of €150bn. We have advised equity investors and lenders on conventional and renewable generation. These transactions include asset disposals, acquisitions, utility re-financings and independent generator project financings.

## ABU DHABI SYSTEM ARRANGMENTS

Abu Dhabi's power and water system was partially unbundled in 1999 with the creation of ADWEA group and specialised sector companies that take responsibility for the different stages of the sector supply chain. Since 2000 a number of Independent Water and Power Producers (IWPP) have been created.

The sector is structured around the Single Buyer model. Generation capacity is procured by ADWEA under a competitive tender process. The winning bidder enters into long-term contracts for 20 years to supply electricity and water. IWPPs are required to generate at a performance specified in their Power and Water Purchase Agreements (PWPA) when they are instructed to do so by the system operator, Transco.

## ISSUES FACING THE ABU DHABI SYSTEM

Since 2000 peak power demand on the Abu Dhabi system has quadrupled to 13GW, while water demand has more than trebled to 800MIGD. We see the following as the key issues for the system in the future:

**Demand uncertainty:** Electricity and water demand are expected to grow strongly in the medium term. ADWEC's base case assumption is for 8% growth per year in electricity to 2020 and 4% per year in water to 2020 but there is a wide-range of outcomes possible.

**Fuel price uncertainty:** Future gas demand may exceed existing ADNOC and Dolphin contracted supply. This would result in the Abu Dhabi system being more exposed to international gas prices. The international gas market is in a state of flux. Increased US shale gas production combined with significant LNG capacity additions mean the market is well-supplied at present. However, demand

for gas driven in particular by Asia and the Middle East may change this picture in the medium term.

**Reverse osmosis:** It is likely that stand-alone Reverse Osmosis (RO) will play a significant part in water production in the future. This has the potential to reduce the linkage between water and power production.

**Nuclear capacity:** The construction of Barakah nuclear power plant (due for full completion in 2020-21), represents a large and abrupt change in the Abu Dhabi capacity mix. At 5.6GW, it will make up around a third of Abu Dhabi's expected peak demand. Nuclear's operational characteristics differ significantly from those of existing plants and require careful integration in to the system.

**Solar PV capacity:** The falling cost of solar PV means that it could even challenge CCGT as the power generation technology of choice at sufficiently high gas prices. This would require careful integration to ensure the variable and non-synchronous nature of solar PV is managed.

**Demand-side response (DSR):** DSR is expected to play an increasing role in Abu Dhabi. By changing the profile of demand, and increasing the flexibility of the demand side, DSR can reduce the need for investment in generation and network capacity.





### PÖYRY MARKET REPORTS

Pöry Management Consulting produces Pöry Market Reports for electricity, gas, carbon and green certificate markets across Europe and a number of countries within Latin America.

Pöry Management Consulting's energy practice provides strategic, commercial, regulatory and policy advice to the global energy market.

Our team of over 200 energy market specialists, located across 12 offices and 10 countries, offers unparalleled expertise in the rapidly changing energy sector.



### OUR MARKET MODEL

BID3 is Pöry's power market model, used to simulate the dispatch of all power stations and renewables on many power markets worldwide, including the European network and parts of South America, Asia-Pacific, and the Middle East.

The model simulates all hours of the year, with multiple historical weather patterns, generating hourly wholesale prices for each country for each future year and dispatch patterns and revenues for each individual plant.

We have worked with the Regulatory and Supervisory Bureau of Abu Dhabi to develop BID3 to fully reflect the nature of the Abu Dhabi system. BID3 undertakes a co-optimisation of water and power reflecting the characteristics of the Abu Dhabi system.

### OUR ABU DHABI MARKET REPORT

We provide a standard report for the Abu Dhabi power and water system. The report provides a comprehensive review of the sector regulations, key players and historic trends. We examine the key issues that the market will face in the future. The report also provides a quantitative analysis of the future evolution of the system to 2040 under three scenarios. The scenarios (High, Central and Low) are designed to test the boundaries of future fuel prices and economic growth. Outputs presented include:

- marginal system price;
- bulk supply tariff;
- average system price;
- generation mix; and
- new capacity additions.

The report can be used as a starting point to assess a variety of issues, which include:

- potential power and water capacity requirements;
- future evolution of the Bulk Supply Tariff;
- revenues that may be achievable in the period after a generator's initial PPA term;
- future gas consumption; and
- future plant operating patterns and potential maintenance requirements.

Pöry is an international consulting and engineering company. We serve clients globally across the energy and industrial sectors and locally in our core markets. We deliver strategic advisory and engineering services, underpinned by strong project implementation capability and expertise. Our focus sectors are power generation, transmission & distribution, forest industry, chemicals & biorefining, mining & metals, transportation, water and real estate sectors. Pöry has an extensive local office network employing about 6,000 experts

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