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GlobalData

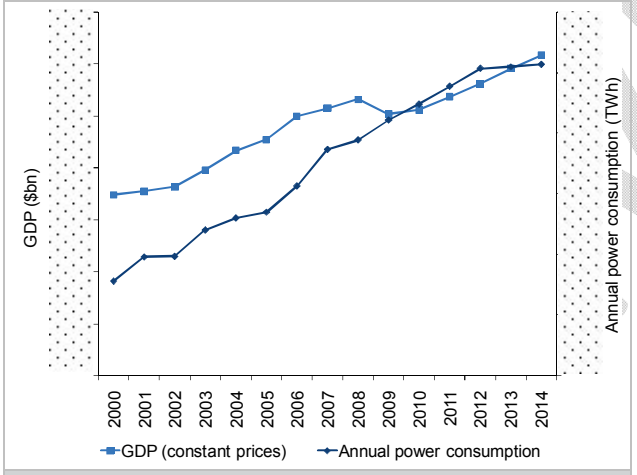
# UAE POWER MARKET OUTLOOK TO 2025, UPDATE 2015 – MARKET TRENDS, REGULATIONS, AND COMPETITIVE LANDSCAPE

# Executive Summary

### UAE's Power Sector Outlook

The UAE has one of the most impressive economies in the Middle East. Largely due to the economic performance of the constituent states of Dubai and Sharjah, its Gross Domestic Product (GDP) increased at a Compound Annual Growth Rate (CAGR) of XX% from $XX billion in 2000 to $XX billion in 2014. Electricity consumption followed suit, growing at a CAGR of XX% during the same period. Although the region is not highly industrialized, the rapid growth of the services industry and vast investment in real estate have ensured the growth of electricity consumption.

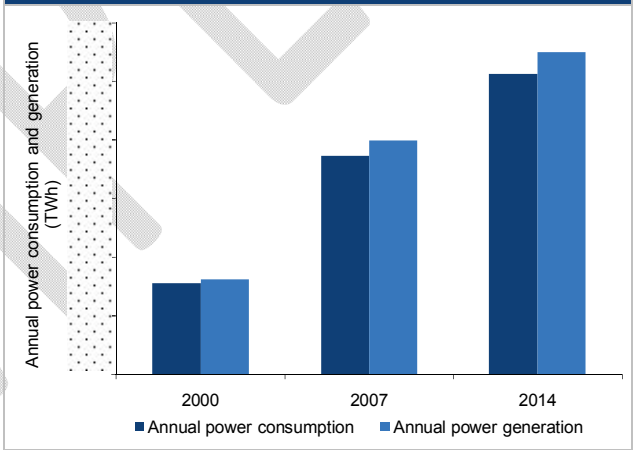
**Power Market, UAE, Gross Domestic Product ($bn) and Annual Power Consumption (TWh), 2000–2014**




Source: GlobalData; IMF, 2014
TWh: Terawatt hour

Annual power consumption increased from XX TWh in 2000 to XX TWh in 2014 at a CAGR of XX% due to growth in both the economy and the size of the population. Annual electricity generation increased during the same period from XX TWh in 2000 to XX TWh in 2014 at a CAGR of XX%. Renewable generation in the UAE is still in its nascent stages, and so the additional electricity generation came almost entirely from thermal sources.

**Power Market, UAE, Annual Power Consumption and Generation (TWh), 2000–2014**




Source: GlobalData, Power Database [Accessed on March 20, 2015]

In 2014, thermal sources accounted for XX% of UAE's total installed capacity, with gas-based capacity contributing XX% and oil-based thermal capacity contributing only XX%. The remaining XX% came from renewable sources, including solar Photovoltaic (PV), Concentrated Solar Power (CSP) and onshore wind.

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## 2 Introduction

The UAE, a federation of seven emirates in the Arabian Peninsula: Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaimah, Sharjah, and Umm al-Quwain, is one of the biggest exporters of oil in the world and plays a major role in the Organization of the Petroleum Exporting Countries (OPEC). It is currently on a high growth trajectory due to substantial oil and gas reserves and is one of the most prosperous countries in the Middle East.

The UAE has an open economy with a high per-capita income and a sizable annual trade surplus. Predominantly an oil-dependent nation, it is trying to diversify its power mix by putting greater emphasis on the development of renewable and nuclear energy. The UAE has undergone robust industrialization over the past few years, making practical and effective use of its substantial natural resources. Private sector participation is increasing significantly, and government agencies are creating better job opportunities. The UAE's Free Trade Zones, which offer XX% foreign ownership and zero taxes, are also providing a major boost to economic development.

In April 2004, the UAE signed a Trade and Investment Framework Agreement with Washington and in November 2004 entered negotiations with the US for a Free Trade Agreement (FTA). However, there has been no advancement in the FTA, mainly due to concerns over the UAE's labor laws and human rights record.

The UAE's Gross Domestic Product (GDP) amounted to $XX billion in 2014, with a growth rate of XX% over 2013 (IMF, 2014). The main driver of the economy is revenue from its oil sector, which helped the economy to grow greatly between 2000 and 2008 until the financial crisis in 2009. This global crisis, which resulted in tight international credit and deflated asset prices, resulted in a negative estimated GDP growth rate of XX% in 2009.

The industrial sector accounted for an estimated share of XX% of overall GDP in 2013, with the services sector accounting for XX%. The agricultural sector accounted for a minimal share of less than XX% (CIA, 2014).

Rapid growth in the economy and in the size of the population has allowed electricity consumption to grow phenomenally. Total power consumption in 2000 was XX Terawatt hours (TWh), which increased to XX TWh in 2014 at a Compound Annual Growth Rate (CAGR) of XX%.

# Introduction

The Federal Electricity and Water Authority (FEWA), Abu Dhabi Water and Electricity Authority (ADWEA), Dubai Electricity and Water Authority (DEWA), and Sharjah Electricity and Water Authority (SEWA), all of which operate under the Ministry of Energy, are responsible for the overall generation, transmission and distribution of energy in their respective emirates. The Regulation and Supervision Bureau (RSB) is an independent regulatory authority responsible for all activities related to the power sector in Abu Dhabi.

## 2.1 GlobalData Report Guidance

- The executive summary captures the key growth trends in the UAE's power market.
- Chapter three provides a snapshot of the key parameters that impact the UAE's power sector, as well as key points about the power market.
- Chapter four provides an analysis of the UAE's power market.
- Chapter five details the regulatory scenario of the power market and the inward foreign investment scenario in the UAE.
- Chapter six provides information on the UAE's cumulative installed capacity and annual generation trends by individual generation source.
- Chapter seven describes the power transmission and distribution infrastructure in the UAE and provides information on interconnectors with neighboring countries. The section also covers electricity imports and exports and upcoming grid-related projects.

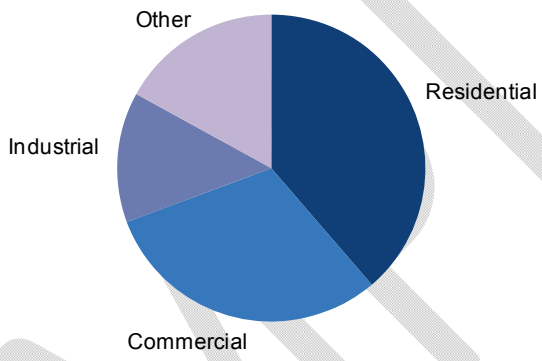
**Note:** All 2014 market numbers provided in the report are estimates, except where actual data were available.

# UAE, Power Market, Market Analysis

### 4.4.1 Electricity Consumption by Sector, 2014

The residential sector is the largest consumer of electricity in the UAE. Its share in the total electricity consumption is increasing, bolstered by the realty boom in Dubai and the rising affluence of its citizens. The residential sector accounted for an estimated XX% of total electricity consumption in 2014, followed immediately by the commercial sector, which accounted for an estimated XX% and the industrial sector with XX%. Other sectors, including government offices and other public utilities, are estimated to have accounted for the remaining XX%.

**Figure 5: Power Market, UAE, Electricity Consumption by Sector (%), 2014**




Source: GlobalData

**Table 5: Power Market, UAE, Electricity Consumption by Sector (%), 2014**

| Sector | Share |
|---|---|
| Residential | |
| Commercial | |
| Industrial | |
| Others | |

Source: GlobalData

# UAE, Power Market, Capacity and Generation Overview

## 6.2 UAE, Power Market, Cumulative Installed Capacity and Annual Power Generation, 2000–2025

In 2000, the UAE's cumulative installed capacity stood at XX GW, which increased to XX GW by 2014 at a CAGR of XX%. Thermal sources, including gas and oil, accounted for more than XX% of capacity in 2014.

Installed capacity is expected to increase at a CAGR of XX% in the 2015–2025 forecast period. Thermal fuel sources will remain the highest contributors in 2025, despite their relative share in the total power mix being expected to decline to XX% by then.

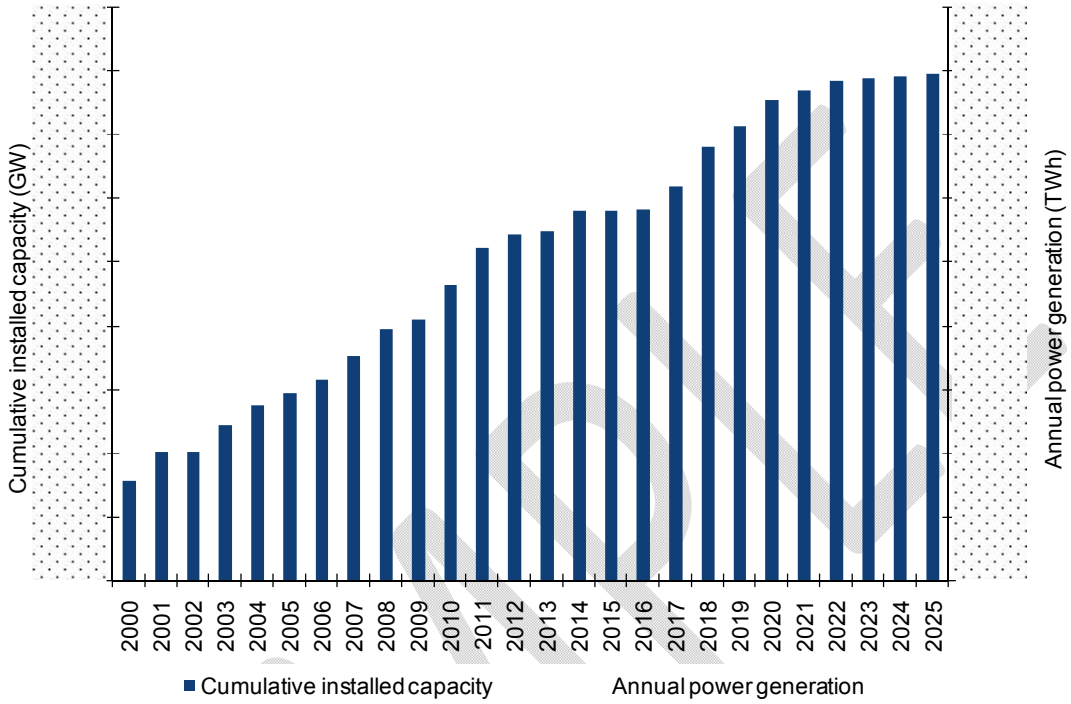
Renewable energy sources are expected to witness the highest CAGR growth, at XX%, during the forecast period. A shift in government focus towards renewable sources due to growing environmental concerns has resulted in the scale-up of solar and wind projects.

Nuclear energy projects are expected to contribute to the total energy mix in the near future, and the first XX GW nuclear power plant will come online by 2017. By 2020, XX GW of nuclear power plants will be set up in the UAE. The government is expected to provide further impetus to the development of nuclear energy projects in the future.

Total electricity generation in the UAE increased from XX TWh in 2000 to XX TWh in 2014, recording a CAGR of XX%. With expected high demand due to robust industrialization and high residential electricity demand, power generation is expected to increase during the forecast period at a CAGR of XX% to XX TWh by 2025. Thermal fuel sources are expected to dominate the power generation mix with XX% (126 TWh) in 2025. Nuclear energy is expected to account for XX% of total generation in the UAE by 2025. The renewable energy sector is expected to register a sharp increase at a CAGR of XX% during the forecast period, reaching an estimated generation of XX TWh by 2025.

## UAE, Power Market, Capacity and Generation Overview

**Figure 7: Power Market, UAE, Cumulative Installed Capacity (GW) and Annual Power Generation (TWh), 2000–2025**




Source: GlobalData, Power Database [Accessed on March 19, 2015]

# UAE, Power Market, Capacity and Generation Overview

**Table 7: Power Market, UAE, Cumulative Installed Capacity (GW) and Annual Power Generation (TWh), 2000–2025**

| Year | Cumulative installed capacity | Annual power generation |
|---|---|---|
| 2000 | | |
| 2001 | | |
| 2002 | | |
| 2003 | | |
| 2004 | | |
| 2005 | | |
| 2006 | | |
| 2007 | | |
| 2008 | | |
| 2009 | | |
| 2010 | | |
| 2011 | | |
| 2012 | | |
| 2013 | | |
| 2014 | | |
| 2015 | | |
| 2016 | | |
| 2017 | | |
| 2018 | | |
| 2019 | | |
| 2020 | | |
| 2021 | | |
| 2022 | | |
| 2023 | | |
| 2024 | | |
| 2025 | | |

Source: GlobalData, Power Database [Accessed on March 19, 2015]

Appendix

# 9 Appendix

## 9.1 Market Definitions

### 9.1.1 Power

Power refers to the rate of production, transfer or energy use, usually related to electricity. It is measured in Watts (W) and often expressed in kilowatts (kW) or Megawatts (MW). It is also known as real power or active power.

### 9.1.2 Installed Capacity

Installed capacity refers to either the generator's nameplate capacity, as stated by the manufacturer, or the maximum rated output of a generator under given conditions. It is given in Megawatts (MW) on a nameplate affixed to the generator.

### 9.1.3 Electricity Generation

Electricity generation refers to the process of generating electricity from other forms of energy. It also refers to the amount of electricity produced. It is expressed in Gigawatt hours (GWh).

### 9.1.4 Electricity Consumption

Electricity consumption is the sum of electricity generated, plus imports, minus exports and transmission and distribution losses. It is measured in Gigawatt hours (GWh).

### 9.1.5 Thermal Power Plant

A thermal power plant is a plant in which turbine generators are driven by burning fossil fuels.

### 9.1.6 Hydropower Plant

A hydropower plant is a plant in which the turbine generators are driven by falling water.

### 9.1.7 Nuclear Power

Nuclear power is the energy released from the fission of nuclear fuel in a reactor.

# Appendix

### 9.1.8 Renewable Energy Resources

Renewable energy resources are those that provide energy that is naturally replenished but limited in the amount of energy available per unit of time. Biomass, geothermal, solar, small hydro and wind are examples of renewable resources.

# Appendix

## 9.2 Abbreviations

| Table 20: Abbreviations | |
|---|---|
| AADC | Al Ain Distribution Company |
| ADDC | Abu Dhabi Distribution Company |
| ADWEA | Abu Dhabi Water and Electricity Authority |
| CAGR | Compound Annual Growth Rate |
| CCGT | Combined-Cycle Gas Turbine |
| Ckm | Circuit kilometer |
| Cogen | Cogeneration |
| CSP | Concentrated Solar Power |
| DEWA | Dubai Electricity and Water Authority |
| DSCE | Dubai Supreme Council of Energy |
| ENEC | Emirates Nuclear Energy Corporation |
| ENG | Emirates National Grid |
| FANR | Federal Authority for Nuclear Regulation |
| FEWA | Federal Electricity and Water Authority |
| FTA | Free Trade Agreement |
| GCC | Gulf Co-operation Council |
| GDP | Gross Domestic Product |
| GW | Gigawatt |
| GWh | Gigawatt hour |
| IAEA | International Atomic Energy Agency |
| KEPCO | Korean Electric Power Corporation |
| kV | kilovolt |
| MW | Megawatt |
| OPEC | Organization of the Petroleum Exporting Countries |
| PV | Photovoltaic |
| RSB | Regulation and Supervision Bureau |
| SEWA | Sharjah Electricity and Water Authority |
| TAQA | Abu Dhabi National Energy Company |
| TRANSCO | Abu Dhabi Transmission and Despatch Company |
| TWh | Terawatt hour |
| WENRA | Western European Nuclear Regulators Association |
| Source: GlobalData | |

# Appendix

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## 9.4 GlobalData's Methodology

GlobalData's dedicated research and analysis teams consist of experienced professionals with advanced statistical expertise and marketing, market research and consulting backgrounds in the energy industry.

GlobalData adheres to the codes of practice of the Market Research Society (www.mrs.org.uk) and Strategic and Competitive Intelligence Professionals (www.scip.org).

All of GlobalData's databases are continuously updated and revised. The following methodology has been followed for the collection and analysis of the data presented in this report.

# Appendix

### 9.4.1 Coverage

This report covers the UAE's power market. It examines the market structure and provides historical and forecast data for generation, capacity and consumption up to 2030. It also looks at the market's regulatory structure, import and export trends, competitive landscape, and leading active and upcoming power projects.

### 9.4.2 Secondary Research and Analysis

The capacity, generation and consumption data is collected and validated using a number of secondary resources, including, but not limited to:

- Government agencies, ministerial websites, industry associations, the World Bank and statistical databases
- Company websites, annual reports, financial reports, broker reports and investor presentations
- Industry trade journals, market reports and other literature
- GlobalData's proprietary databases such as the Capacity and Generation Database, Power Plant Database and Transmission and Distribution Database

Further to this, the following secondary information is collected and analyzed to project the UAE's power market scenario to 2030, analyzing factors such as:

- Macro-economic scenario
- Government regulations, policies and targets
- Government and private sector investment
- Contract and deal announcements
- Utility expansion plans
- The sector's historical track record
- Other qualitative insights built through secondary research and analysis of company websites, annual reports, investor presentations, industry and trade journals, and data from industry associations.

# Appendix

### 9.4.3 Primary Research and Analysis

Secondary research is further complemented through primary interviews with industry participants to verify the market numbers obtained through secondary research and obtain first-hand information on industry trends.

The participants are drawn from a diverse set of backgrounds, including equipment manufacturers, industry associations, government bodies, utilities, distributors, and academia. The participants include but are not limited to C-level executives, industry consultants, academic experts, business development and sales managers, purchasing managers, plant managers, government officials and industry spokespeople.

## 9.5 Disclaimer