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Electricity sector in Oman after 10 years of reform: Status, trends, and future perspectives

Mohammed H. Albadi

Department of Electrical and Computer Engineering, Sultan Qaboos University, PO Box 33, Muscat 132, Oman

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ABSTRACT

A market reform implemented in Oman in 2004 changed the electricity sector from being a vertically integrated system owned and operated by the Ministry of Housing, Electricity, and Water to a new unbundled system populated by a range of companies and an independent regulator. The restructuring has supported a more than doubling of supplied energy in the succeeding decade, but in a manner that is unsustainable due to high subsidies and lack of supply mix diversity.

1. Introduction

Power systems play an important role in today's world as they transfer electricity between producers and consumers and provide an efficient method of energy consumption. Power systems used to be vertically integrated in which the same entity generates, transmits, distributes, and supplies electricity to end-use customers. However, the way of doing business in the electricity sector started to change in 1990s as different degrees of reforms were implemented. In general, reform in the electricity sector involves unbundling different activities of vertically integrated systems. The goals of restructuring the electricity sector are country specific. These goals include reducing the costs of providing electricity on governments, generating revenues by selling government-owned assets, attracting private investment especially in electricity generation activities, and achieving an efficient and sustainable sector (Bhattacharya et al., 2012). With high penetration of distributed energy resources in the power sector, more unbundling and market fragmentation is expected (Al-Asaad, 2009). One of the main drivers of reform in the electricity sector in Oman was the massive investment requirement in the sector due to the expected increase in population as well as the growth of energy-intensive projects such as petrochemical, aluminum, cement, and steel industries (Al-Asaad, 2009; Al-Faris, 2002).

On December 21, 1999, the Council of Ministers approved the restructuring and privatization strategy of the electricity and the related water sector, which was under the Ministry of Housing, Electricity, and Water (MHEW). On July 7, 2004, the law regulating and privatizing the electricity and related water sectors in Oman was issued through Royal Decree 78/2004 (Royal Decree, 2004). The Sector Law's 155 articles implement a new market structure, pave the way for further electricity privatization, and establish an independent regulator to oversee the public interest of the sector. Accordingly, on May 1, 2005, the Ministry of National Economy implemented a transfer scheme whereby electricity and related water assets, liabilities, and staff of MHEW were transferred to the successor companies. In addition, the Authority for Electricity Regulation (AER) was established to regulate the new electricity sector and some aspects of the water sector (AER, 2006).

In the past 10 years, Oman's population and GDP witnessed a substantial increase as shown in Fig. 1 (Worldbank, 2016). This large increase in population and economic activities was reflected on electricity demand and the required power system infrastructure.

This article is an attempt to present the status of electricity in Oman, summarize the trends during the past 10 years, and present the main challenges and future perspectives. Following this introduction, the article presents the current structure of the power sector in Oman. Section 3 presents the current regulated transactions in the sector. Section 4 presents and discusses the observed trends of the system operation efficiency and demand. Section 5 discusses the three main challenges of the electricity sector, followed by renewable energy prospects in Section 6. Finally, a summary and recommendations are presented in Section 7.

2. Current power sector market structure

Currently, Oman has three distinct power systems: the main interconnected system (MIS) in the northern part, the Dhofar power system (DPS) in the south, and Rural Areas Electricity Company (RAEC) systems. In 2015, the electricity supply was 25.513 TWh in the MIS, 2.583 TWh in the DPS, and 0.816 TWh in other rural systems (AER, 2016a). The market structure of the electricity sector in Oman is shown

E-mail address: mbadi@squ.edu.om.

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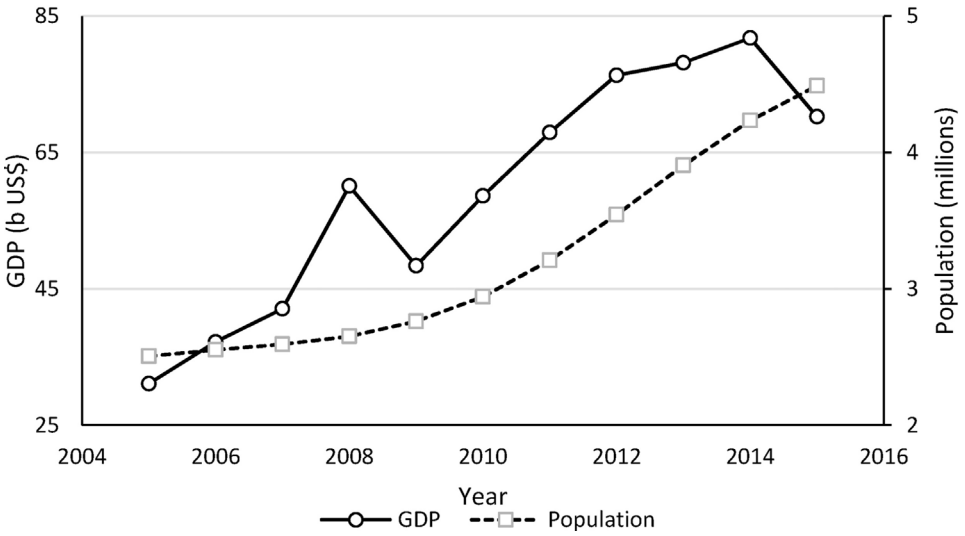

Fig. 1. Oman's GDP and population growth.

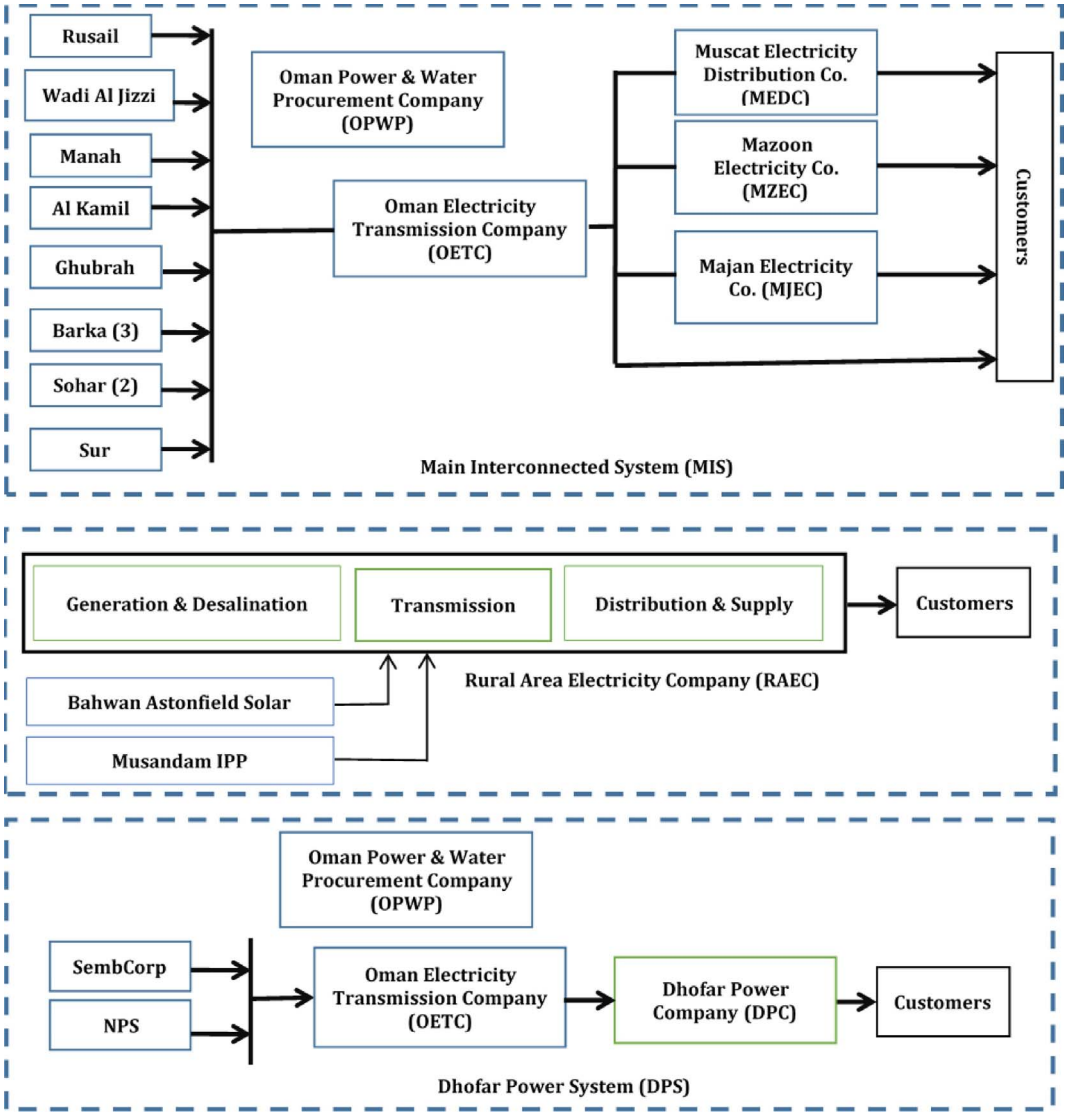

Fig. 2. Current market structure.