Why is there almost no renewable energy in Oman?

blogs.lse.ac.uk/mec/2017/01/23/why-is-there-almost-no-renewable-energy-in-oman/

1/23/2017

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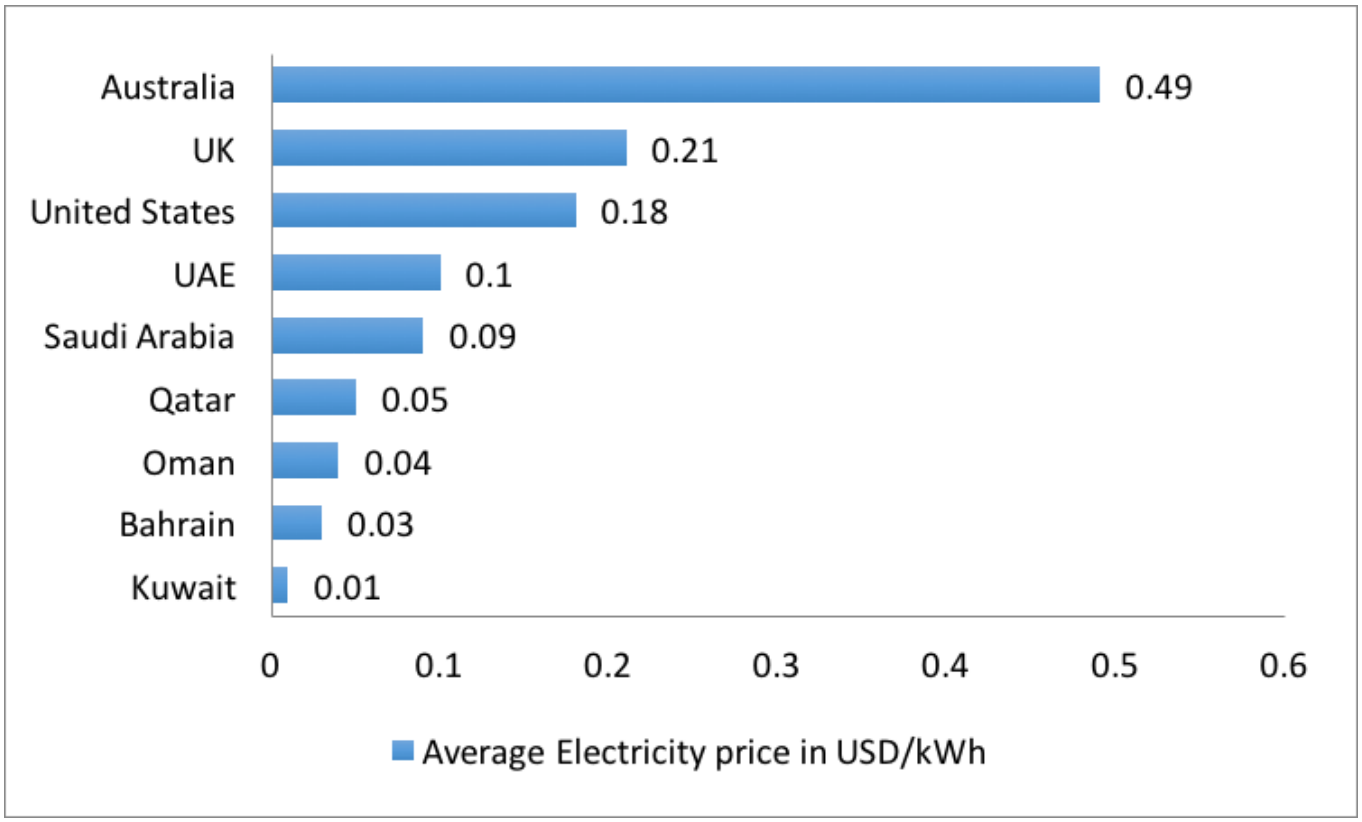
Petrochemical tanks in Sohar, Oman. © Ryan Lackey via Flickr.

Despite the abundance of renewable energy resources in Oman, especially wind and solar, the country's deployment of renewable energy does not exceed one percent. Domestic oil and gas resources play a major role in this. At present, natural gas accounts for 97 percent of fuel used for power generation, while diesel accounts for 3 percent, and the abundance of these resources has influenced governmental policy, with the Omani government subsidising both the generation and distribution of power from fossil fuels.

On the power generation side, despite the recent reform of natural gas price from 1.5 USD per one British Thermal Unit (BTU) to 3 USD per one BTU, natural gas is sold by the government to power generators at a low price of 3 USD per one British Thermal Unit (BTU) – much lower than the price in the international market. The government subsidy covering this cost difference is 344.2 million Omani Rial per year, subject to increase alongside the cost of gas in the international market. This increase can be as much as twofold, as the price of natural gas in the international market can reach a cost of 9 USD per million British Thermal units.

On the power distribution side, the electricity tariff structure has been fixed since the 1980s, meaning that electricity consumers in Oman pay only 54 percent of production costs to electricity distribution companies, while the government subsidises the rest. Because of this, electricity prices in Oman, as well as other GCC countries, are amongst the lowest in the world (see Figure 1).

Figure 1. Average electricity price in the GCC, US, UK and Australia in 2015. Sources: IMF 2015; Statistica 2015.



Government subsidies disadvantage the competitiveness of renewable energy technologies compared to natural gas-based technologies, such as open cycle gas turbine (OCGT), closed cycle gas turbine (CCGT), and diesel-based power generation. These are also disadvantaged by the exclusion of the cost of potential environmental impacts in the calculation of electricity production cost when using fossil fuel resources. Thus, for all renewable energy technologies, based on 2014 data, the average Levelised Cost of Electricity (LCOE) remains significantly higher than the average for CCGT and OCGT (USD 0.02–0.05 per kWh), despite the lowest cost of large-scale solar PV that hit a record of USD 0.06 per kWh recorded in Dubai in 2014 (see Table 1). Hence, there is no incentive for electricity consumers to invest in expensive renewable energy technologies.

Table 1. A summary of the cost difference between electricity prices generated from renewable energy technologies and gas-fired power plants. Data aggregated from IRENA reports.

Technology type	Investment cost (USD/kW)	Average LCOE (USD/kWh) in 2014
CCGT	1100	0.02–0.05
OCGT	750	0.02–0.05
Utility-scale solar PV	1,570–4,340	0.11–0.28 (0.06 in Dubai, without any financial support)
Residential solar PV	Not available	0.14–0.47
Parabolic trough solar CSP	3,550–8,760 (in 2013)	0.17–0.35
Solar towers CSP	3,550–8,760 (in 2013)	0.17–0.29
Onshore wind	1,280–2,290	0.06–0.12

Based on the above analysis, two options are available to promote the deployment of renewable energy: the reform of power subsidies or better use of existing power purchase agreements (financial agreements between the seller and buyer).

Power subsidies could be reformed such that electricity prices reflect the cost of production. This will not only increase the competitiveness of renewables but will also incentivise more efficient use of electricity. Additionally, a cut in power subsidies would reduce pressure on the state budget, which is particularly relevant given the recent drop in oil prices. Further research needs to be done to study the potential effects of these measures on electricity consumers, especially on the residential sector. Rooftop PV module installations (solar panels) can be promising for the spread of small-scale renewable energy projects. Net metering, a billing mechanism that credits solar energy system owners for the electricity they generate, also has the potential to encourage consumers to predict their own electricity consumption and production from renewable sources.

Regarding the use of existing power purchase agreements, the government could take an active role in supporting and facilitating the production of electricity from large-scale projects by defining the targets for renewable energy share in total electricity generation. In this case, the regulatory authority could announce its requirement to install a specific capacity of renewable electricity as Independent Power Producers model (IPP) to project developers. The winning bidder (selected based on specific technical and economic requirements) would benefit from a long-term contract that guaranteed their long-term Power Purchase Agreement (PPA) without raising consumer prices. This would attract the attention of renewable energy investors to the possibilities that exist in Oman.

Fossil fuel resources are finite. They will run out one day. Achieving a thorough understanding of the challenges facing renewable energy deployment in Oman is needed in order to explore the available opportunities for increasing renewable energy deployment. Such an understanding may in the future guide the formulation of a renewable energy regulatory framework and enhance the security of electricity supply.

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