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Saudi Arabia's Cautious Approach to Solar Power Policy

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The desire to harness the power of the sun to meet Saudi Arabia's energy needs is understandable. With intense, year-round solar radiation, as well as a vast expanse of land, the Kingdom is blessed with the physical requirements needed to take advantage of this source of renewable energy. Likewise, the opportunity cost of the countless barrels of oil that are currently used for power generation is a cause for considering alternative energy sources. While the neighboring United Arab Emirates may have taken an early lead in developing a solar generation capacity, Saudi Arabia has launched a variety of reforms and projects that are rapidly establishing the Kingdom's presence in the solar energy sphere. Much media attention has been given to the most ambitious projects, such as the 200 gigawatt (GW) Softbank agreement of March 2018 and the reliance on renewable energy for NEOM, the transnational city and economic zone being constructed near Tabuk, and their feasibility has been widely discussed. However, the policies that have the greatest effect on the citizens of Saudi Arabia and the Kingdom's business community are often overlooked. The successful development of the nation's utility-scale photovoltaic capacity and tendering process, as well as the overhaul of electricity tariffs, are the building blocks on which Saudi Arabia's most ambitious—and utilitarian—plans will rely. Unlike the volatile nature of the "megaprojects," the Saudi government's approach to these most crucial innovations has been marked by caution and gradual progression, in order to guarantee their success.

The Kingdom's solar ambitions are best elucidated within the seminal Vision 2030 plan, which establishes that the country's growing electricity demand will be met through revitalization of the renewable energy market. An initial target of 9.5 GW of renewable generation capacity was established, before being revised up to 60 GW in early 2019.(1) The private sector plays an integral role in this objective, with the Vision 2030 plan suggesting that reforms to market-based electricity tariffs will invite investment and

(1) Tom Kenning, "Saudi Arabia Plans 60GW of Renewable Energy by 2030," PV-Tech, Jan. 14, 2019, https://www.pv-tech.org/news/saudi-arabia-plans-60gw-of-renewable-energy-by-2030.

diversification of the energy mix. The manufacturing of the necessary components for the generation of renewable energy has been highlighted both as a target for localization and as part of a broader reform of the national economy, and it is envisioned that the private sector's contribution to gross domestic product (GDP) will rise from 40 to 65 percent.

Slow and Steady Utility-Scale Development

In recent months, the development of utility-scale solar power generation has met the remarkable challenge of simultaneously breaking global records while also sufficiently maintaining the confidence of investors. The Sakaka 30 MW photovoltaic (PV) development in the Al Jouf region of the country represents the first solar project under the King Salman Renewable Energy Initiative, and the country's single largest solar installation. Bidding for the rights to operate the site as an independent power producer (IPP) resulted in a world record–breaking successful bid of 2.3417 US cents/kWh (or 8.781 halalas/kWh) by a consortium led by the Saudi firm ACWA Power. The competitive auction process, overseen by the Kingdom's Renewable Energy Project Development Office (REPDO), was the first of its kind and scale. With a healthy amount of competition among the eight or more firms who submitted bids for the project, the tendering process has demonstrated both the attractiveness of the Saudi solar power industry to investors and the orderly and straightforward nature of the office overseeing its implementation.

The unintuitive cause for confidence for potential investors, however, is the very fact that the ACWA Power bid was not the lowest. A consortium led by the Abu Dhabi Future Energy Company (also known as Masdar) and France's EDF Énergies Nouvelles submitted a bid of 1.78567 US cents/kWh, which would have set a more substantial world record. However, according to the head of REPDO, Turki Al Shehri, the proposals were assessed primarily based on their feasibility, including the ability to secure funding, rather than whether they broke any records.[2] Similarly, according to the CEO of ACWA Power, Paddy Padmanathan, "The request for proposals had very clear requirements on the technology having been used elsewhere, contractors being able to show they had done the work before, the financing and so on."[3] It is believed that the lowest bid was reliant upon bifacial solar photovoltaic (PV) technology, which would capture solar power from both the front and back sides of solar modules, rather than from just one side. At that time, however, there were significant concerns regarding its technological feasibility, which in turn cast doubts about the likelihood of the bid finding the requisite funding. Thus, REPDO's approach is characterized by a level of pragmatism. While the broad objectives unveiled by Saudi policymakers are ambitious in size, their implementation, particularly for utility-scale projects, is marked by a conscious effort to foster a sustainable and stable business environment. This stability will be key to achieving continued investor confidence in existing and future solar projects alike.

(2) Author's face-to-face interview in Riyadh, January 21st 2019.

(3) John Parnell, "Bifacial Technology Was Likely Reason World's Lowest Ever Solar Bid Was Rejected," Editor's Blog, PV-Tech, Jan. 22, 2018, https://www.pv-tech.org/editors-blog/bifacial-technology-was-likely-reason-worlds-lowest-ever-solar-bid-was-reje.

Cautious Tariff Reforms

Electricity pricing is somewhat cyclical in nature as, in a market-based system, it is primarily affected by the way in which it is generated. However, the cost to consumers, which generally reflects the cost of production, is a central factor in the way in which electricity is used, as well as affecting the feasibility of alternative forms of generation. Saudi Arabia's enduring electricity subsidies, which distort the price consumers pay, thus have significant implications for the nature of household demand for electricity as well as for the generation of solar power.

Recent analysis from researchers at the King Abdullah Petroleum Studies and Research Center (KAPSARC) suggests that both income and perceived wealth play a significant role in the demand for electricity by Saudi households.(4) With the International Monetary Fund (IMF) projecting that the Saudi economy will continue to grow at a steady pace,(5) it is not surprising that demand for electricity in the Kingdom is likewise projected to undergo a steady increase in demand.(6) In addition to becoming increasingly costly for the public exchequer due to this projected increase in demand, the continued subsidization of consumer electricity disincentivizes the adoption of distributed photovoltaic generation in the Kingdom.

The myriad incentives for reforming these subsidies have no doubt contributed to the prioritization of market-based electricity pricing, as is evident in its mention within the Vision 2030 plan. Despite this multifaced benefit, implementing reforms to the system of electricity tariffs is a hazardous task and risks applying a punishing shock to lifestyles and livelihoods alike. Consequently, a cash-transfer program for low- and middle-income Saudis, known as the Citizens Account, was introduced in December 2017 to offset some of the financial pressure brought about by electricity and fuel price reforms. Shortly thereafter, in January 2018, electricity tariffs were revised upward to better reflect the cost of generation. The creation of the Citizens Account program thus provides policymakers with another policy mechanism with which they can cushion the effect of these fundamental reforms, particularly for the most vulnerable in society. According to Dr. Saeed bin Abdullah Al Sheikh and Dr. Fahad bin Jumah, members of the Majlis Ash-Shura, the Citizens Account program is renewed on an annual basis.(7) It thus remains to be seen if the program will endure in the long term, particularly if Saudi households acclimatize to the reforms.

While the January 2018 tariff reforms represent a step toward a market-determined price, they both fall short of completely meeting that goal, while also precluding the expansion of distributed photovoltaic generation. Interviews with entrepreneurs in the solar energy industry at the Second Jubail Energy Management Conference in January 2019 consistently revealed that the greatest challenge to the growth

(4) Goblan Al Gahtani, Carlo Andrea Bollino, Simona Bigerna, and Axel Pierru, "Estimating the Household Consumption Function in Saudi Arabia," KAPSARC Discussion Paper, Feb. 5, 2019, https://www.kapsarc.org/research/publications/estimating-the-household-consumption-function-in-saudi-arabia/.

(5) Frank Kane, "Davos: IMF Raises Saudi Economic Growth Forecast for 2020," Arab News, Jan. 21, 2019, http://www.arabnews.com/node/1439316/business-economy.

(6) Robert F. Ichord, "Saudi Arabia's Vision 2030: Key Electric Power Decisions Ahead," EnergySource Blog, Atlantic Council, Mar. 20, 2018, https://www.atlanticcouncil.org/blogs/energysource/saudi-arabia-s-vision-2030-key-electric-power-decisions-ahead.

(7) Author's face-to-face interviews in Riyadh, January 23rd 2019.

of household solar systems was the continued subsidization of electricity.[8] While some entrepreneurs welcomed the January 2018 reforms, which have made privately owned solar systems and energy-saving technology attractive for some companies, the large-scale deployment of rooftop panels is yet to be realized due to the technology's current lack of price competitiveness. With the stated objective of achieving market-based tariffs in the Vision 2030 plan, there is cause for optimism that further tariff reforms will occur in the near future—thus increasing the feasibility of distributed generation. Although the reform of tariffs will present a variety of benefits to both government and the business community, while also reducing the country's carbon footprint, the potential for social and economic disruption has necessitated a gradual and cautious implementation.

Conclusion

The significant international interest in the development of solar power in Saudi Arabia is testament to the lucrative potential of the industry. The country's current energy profile, coupled with its unique climate and geography, have positioned the Kingdom to rapidly reap the benefits of a shift to renewable energy. While the headline-grabbing "megaprojects" are a unique feature of Saudi policy making, their success or failure will not be the defining feature of the country's renewable energy industries. Rather, a successful, sustainable, and internationally competitive solar power industry will be the product of a cohesive policy ecosystem. Given the fundamental nature of these policies, which underpin the success of megaprojects and affiliated industries alike, Saudi policy making has been characterized by caution and a process of gradual reforms. A robust and transparent tendering process for utility-scale generation will encourage private investment. This, in turn, will also develop an industry that is financially resilient, rather than rapidly achieving goals at the cost of financial stability. Similarly, the gradual reform of electricity tariffs, accompanied by the implementation of a social security net, will help to taper excessive electricity consumption. Consequently, these reforms will increase the financial viability of private photovoltaic systems.

(8) Author's face-to-face interviews in Jubail, January 14th and 15th 2019.