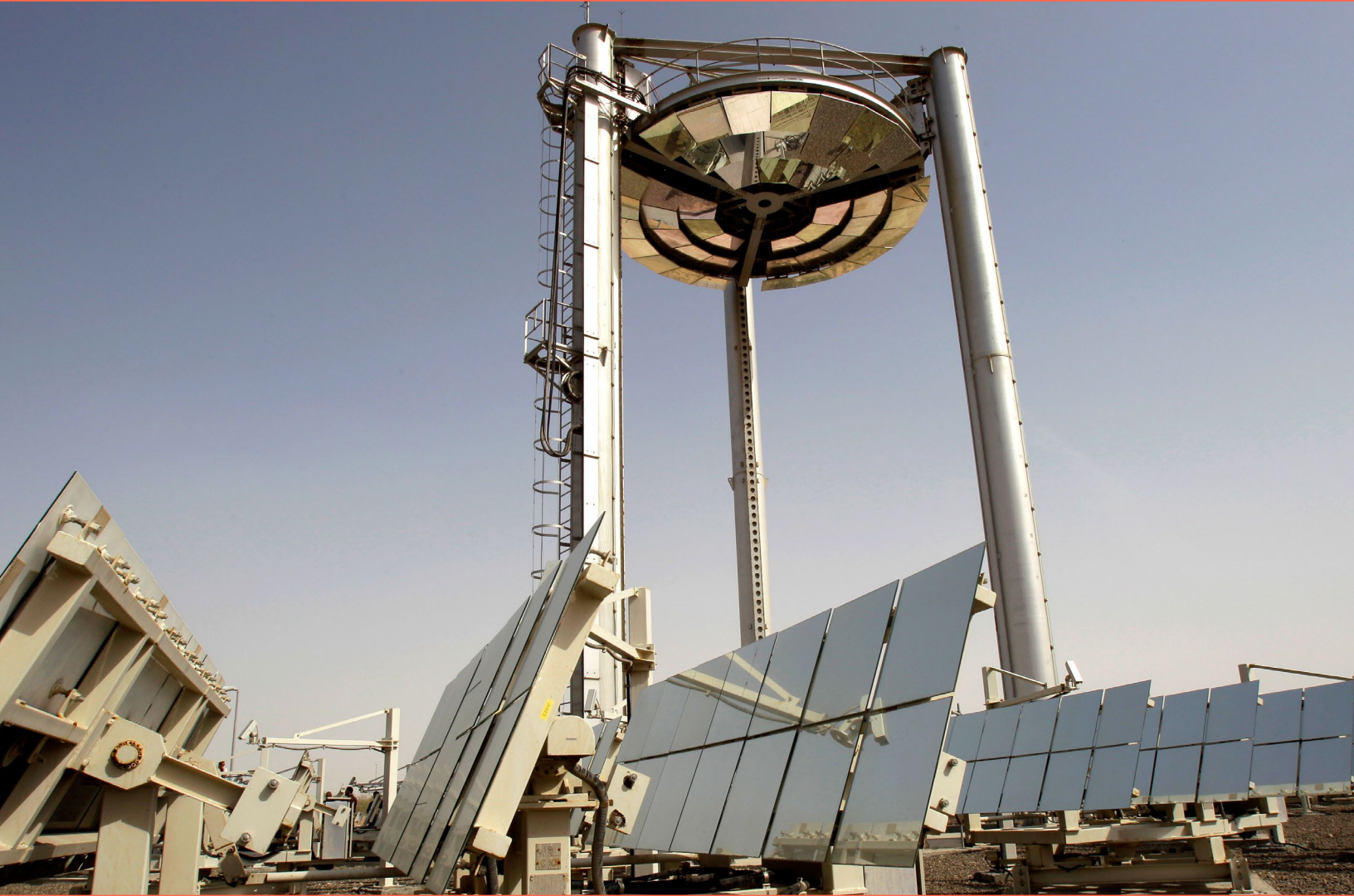




The Arab Gulf States  
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Building bridges of understanding



## The AGSIW *Visions of Change* Series

Prioritizing Renewable Energy in a Time of  
Fiscal Austerity

Karen E. Young



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## The AGSIW *Visions of Change* Series

As Gulf Arab governments adjust to fiscal deficits driven by lower oil prices, the state, traditionally the leader in economic development, is under pressure to utilize available finance from the private sector. In labor markets, the state will need to reassess its role in providing the bulk of job creation for Gulf citizens, as well as question its reliance on low-wage foreign labor. These recalibrations of the Gulf economic development model have been under discussion in the “visions” of national development plans for some time. But the necessity of expeditious structural reforms is now far more pressing. Diversification away from resource-dependent state spending will require changes across the economies, and the societies, of the Gulf Arab countries.

This paper is a part of AGSIW's *Visions of Change* series, examining how the Gulf Arab countries are addressing reduced hydro-carbon revenue and responding to pressures to liberalize their economies. This series engages how these efforts are unfolding across the region, by sector and country, to underline the challenges, opportunities, and risks of innovation and economic change.

## About the Author

**Karen E. Young** is a senior resident scholar at the Arab Gulf States Institute in Washington. She joined AGSIW in July 2015 from the Middle East Centre of the London School of Economics and Political Science where she was a research fellow (2014-15) and visiting fellow (2013, 2015-17). From 2009-14, she was an assistant professor of political science at the American University of Sharjah (UAE). Her research interests are based in comparative politics and political economy, focusing on processes of economic and political transition, state formation, and foreign policy decision making.

Young is the author of *The Political Economy of Energy, Finance and Security in the United Arab Emirates: Between the Majilis and the Market*, published by Palgrave in 2014. She has published widely in policy and academic journals and her comments are featured regularly in the Gulf regional and international media. Young writes a regular commentary for AGSIW on Gulf politics and finance called Market Watch.

Young earned a PhD in political science from the City University of New York, an MA in political science from Columbia University, an MA in international economic relations from the Universidad Andina Simon Bolivar (Quito), and a BA in anthropology from Wellesley College. She has worked in university administration at New York University and held research positions at the Ford Foundation, the Ralph Bunche Institute, and the Program on States and Security at the City University of New York.

## Executive Summary

Surging population growth, large-scale infrastructure investment, and economic development progress have led to increased energy demand in the Gulf Cooperation Council states. Since late 2014, the new normal of low oil prices has necessitated fiscal constraints and at the same time prompted greater interest in renewable energy sources. It is therefore an opportune moment to examine the demand for and supply of renewable energy finance. Making renewable energy work in the GCC states would meet long-standing economic diversification goals. Seizing the moment for change would also take advantage of shifts in global capital markets that have generated new products for infrastructure and energy finance. Asking why now, this paper contextualizes renewable energy investment and production within the current fiscal challenges of the Gulf Arab states.

The decline in oil prices since late 2014 has created a changed policy environment in which structural reforms in the GCC states are both necessary and politically feasible. There is general public acquiescence to the need for economic diversification away from oil revenue as well as for the provision of energy from renewable sources for domestic consumption. The introduction of subsidy reforms and subsequent increase in the price of fuel, electricity, and water across the GCC states has been met, for the most part, with little confrontation.

Regulatory reform within the financial sector could provide incentives for innovative financing of the renewable energy infrastructure. The financing of renewable energy within the Gulf states will require state investment, as well as public-private partnerships including foreign direct investment. The current regulatory framework to encourage partnerships and foreign investment is varied across the Gulf Arab states, leaving many gaps in insolvency and dispute settlement processes.

The short term could be an opportunity for renewable energy finance and innovation, as the global climate for infrastructure investment improves. The risks, however, are many: a steep increase in the global price of oil and gas could derail a diversification effort, while a sharp reduction in government outlays could create recession and worsen the investment climate for infrastructure development.

## Introduction

The decline in oil prices since late 2014 has created a changed policy environment for oil exporting countries, particularly those of the Gulf Cooperation Council, in which structural reforms are both necessary and politically feasible. The introduction of subsidy reforms and subsequent increase in the price of fuel, electricity, and water across the GCC states has been met, for the most part, with little confrontation. There is general public acquiescence to the need for economic diversification away from oil revenue as well as for the provision of energy from renewable sources for domestic consumption. The financing of renewable energy within the Gulf states will require state investment, as well as public-private partnerships including foreign direct investment. The opportunities for regulatory reform within the financial sector could provide incentives for innovative financing of the renewable energy infrastructure. The risks, however, are many; a steep increase in the global price of oil and gas could derail a

diversification effort, while a sharp reduction in government outlays could create recession and worsen the investment climate for infrastructure development. The regulatory framework to encourage partnerships and foreign investment is also varied across the Gulf Arab states, leaving many gaps in insolvency and dispute settlement processes. The short term could be an opportunity for renewable energy finance and innovation, as the global climate for infrastructure investment improves.

The current restraints on fiscal policy due to the decline in oil revenue have created both a logic for reform and demand for savings in government expenditure, which renewables can provide. Renewables can create savings simply by allowing oil and gas resources to be dedicated to export, rather than domestic consumption. Yet these restraints also create some disincentives for government spending in infrastructure. The new fiscal austerity has compelled governments across the GCC states to consider new ways to finance many of their spending needs, and financing renewable energy production is no exception. In an effort to analyze these simultaneous political and economic changes inside the Gulf region, this paper has two aims. First, it describes the demand for and supply of renewable energy finance, in the context of global capital markets and as part of larger economic diversification goals set out by the six GCC states. Second, the paper seeks to contextualize the public policy goal of producing energy from renewable sources within the fiscal limits on government resources, and within the constraints of institutional frameworks.

The paper begins by explaining the depth and diversity of the current fiscal crisis affecting the six GCC states. It then presents an analysis of the risk and opportunities supporting the renewable energy sector in the region, with specific attention to the institutional frameworks in laws on finance and public-private partnerships in the GCC states. Finally, the paper explores how a policy framework and industry support nexus can invigorate renewable energy policy and production, with a case study of the renewable energy landscape in the United Arab Emirates.

## Fiscal Constraint Disrupts Traditional Roles of GCC Governments

Historically, oil-exporting economies of the Gulf Arab states have privileged citizens through an economic model in which the state is the engine of growth, a source of employment, and the provider of a range of social and economic benefits, including health care, housing, subsidized energy, and free education. This is part of a social contract: In exchange for this generous welfare state, citizens accept limits on political voice and representation. This rentier model is abstract and there are certainly areas in which domestic politics are more complex and consultative, despite the resilience of authoritarian rule within the Gulf region.<sup>1</sup> Besides political institutions, the societies are influenced by informal institutions, religious thought, and norms that maintain an affinity for the public provision of services.

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<sup>1</sup> Karen E. Young, *The Political Economy of Energy, Finance and Security in the United Arab Emirates: Between the Majilis and the Market* (New York: Palgrave, 2014).

In the difficult Gulf climate, citizens and residents rely on the state for the basic provisions for survival. The particularly precious commodities of water and energy are at the core of this social contract, and have been consistently provided at highly subsidized prices. In fact, many Gulf citizens view the provision of water as tantamount to a state religious duty.

In the oil and gas boom decade of 2004-13, wealth generated from oil and gas exports supported a model of state capitalism and enabled unprecedented growth in GCC state institutions.<sup>2</sup> The size of governments ballooned and massive projects were launched in infrastructure in roads, sea ports, power plants, and airports. Additionally, new cities grew rapidly, often populated by young citizens and expatriate workers.

More recently, a new era of low energy prices has emerged.<sup>3</sup> The primary contributing factors are generally agreed to be more oil coming to the market while global demand weakened. Technology innovations made it possible to extract oil and gas from more difficult physical environments and also led to the shale oil revolution. Simultaneously, there was a slowdown in demand for oil and gas from the major consumers: Economic growth slowed in Asia while the United States pursued a strategy of greater energy independence.

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*By 2016, the oil boom came to an abrupt end and all the GCC states found themselves in fiscal deficit – some for the first time in over a decade.*

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By 2016, the oil boom came to an abrupt end and all the GCC states found themselves in fiscal deficit – some for the first time in over a decade. Under this new fiscal reality, GCC countries have to cope with citizens who have become accustomed to government delivery of the necessary structural environment for economic growth, including readily available and low-priced sources of energy for electricity, water desalination, and transport.

Production of electricity is a major cost to Gulf governments; as most generation is from oil or associated gas, it is also a major absorber of valuable export resources.<sup>4</sup> Additionally, as most of the states have very little access to a natural, clean water supply, one of the primary purposes of power generation in the region is to support desalination of water. Failure to provide these critical services would pose a direct threat to the state itself. Yet as national revenue has plummeted, the cost (as a proportion of government spending) of providing these public goods has soared. In some cases, this has been to the point that the current fiscal reality challenges the traditional social contracts of the state, including the ability to deliver economic opportunity and public goods.<sup>5</sup>

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<sup>2</sup> Kristian Coates Ulrichsen, *The Gulf States in International Political Economy* (New York: Palgrave Macmillan, 2016), 61-82.

<sup>3</sup> Laura El-Katiri, "[Vulnerability, Resilience and Reform: The GCC and the Oil Price Crisis of 2014-2016](#)," *Columbia University, Center on Global Energy Policy*, December 2016.

<sup>4</sup> "[Energy Price Reforms in the GCC—What Can Be Learned From International Experience?](#)" *International Monetary Fund*, November 10, 2015.

<sup>5</sup> Justin Gengler and Laurent A. Lambert, "Renegotiating the Ruling Bargain: Selling Fiscal Reform in the GCC," *The Middle East Journal* 70, no. 2 (Spring 2016): 321-29.

Considering fiscal restraints for the Gulf Arab states post 2014, and in the context of an economic reform agenda that has been unfolding since 2015, a renewable energy strategy as an alternative to oil- and gas-fired electricity and desalination plants has begun to make economic sense. Yet this agenda has to tackle long-standing beliefs that certain provisions, including water and often electricity, are rights, not commodities. Recognizing that the reduction of subsidies for utilities poses a direct challenge to the existing social order, governments have been cautious in pursuing reform. Yet action undertaken by some states has yet to foment significant dissent.

After exploring the challenge of rising energy demand and the opportunity for renewables, it is necessary to examine current efforts and the ongoing need to reform specific legal frameworks to better enable financing of large infrastructure investment, specifically renewable energy production, in each of the GCC states. This includes reducing subsidies for electricity and water, adopting proven mechanisms for privatization, and finding ways to meet funding gaps without government support and by securing external financing. The paper provides some background on private partners that could participate in developing large renewable energy projects, including the banking sector, international financial institutions, investors, and even contractors. In each section, some examples of recent reform measures are highlighted, but the range of examples is by no means exhaustive as efforts are underway across the GCC states. A case study of the UAE provides a more complete picture of interrelated activity in a single state.

## Rising Energy Demand Supports the Case for Increased Renewables

The drivers of rising energy demand in the GCC states are quite straightforward: A population explosion (citizens and foreign laborers) and rapid economic development over the last three decades have led to surging demand for electricity, for industrial and residential uses. As these societies grow, their needs for infrastructure and services are also expanding. Governments have responded by devoting substantial resources to constructing cities, prioritizing housing and retail properties, but also creating the support infrastructure in roads, water, and electricity generation to connect them.

The oil boom of the 1970s did not create the same kind of domestically-directed fiscal expenditure; spending included the subsidization of domestic energy consumption, largely in fuel, electricity, and water.

For decades, electricity generation in the GCC states has been dominated by gas-

and oil-fired plants. As export revenue from hydrocarbons has sharply declined, it is becoming untenable to use expensive fuels for domestic energy production that could otherwise be directed to export sales or domestic manufacturing of petrochemicals, or saved for later export. Furthermore, the transfer of energy between GCC states remains limited in both the

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*As export revenue from hydrocarbons has sharply declined, it is becoming untenable to use expensive fuels for domestic energy production that could otherwise be directed to export sales or domestic manufacturing of petrochemicals, or saved for later export.*

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transfer and exchange of electricity and the import and export of liquefied natural gas, forcing states to rely on – and potentially exhaust – domestic sources of energy (largely oil) rather than trading and mixing gas and solar energy for electricity generation, for example.

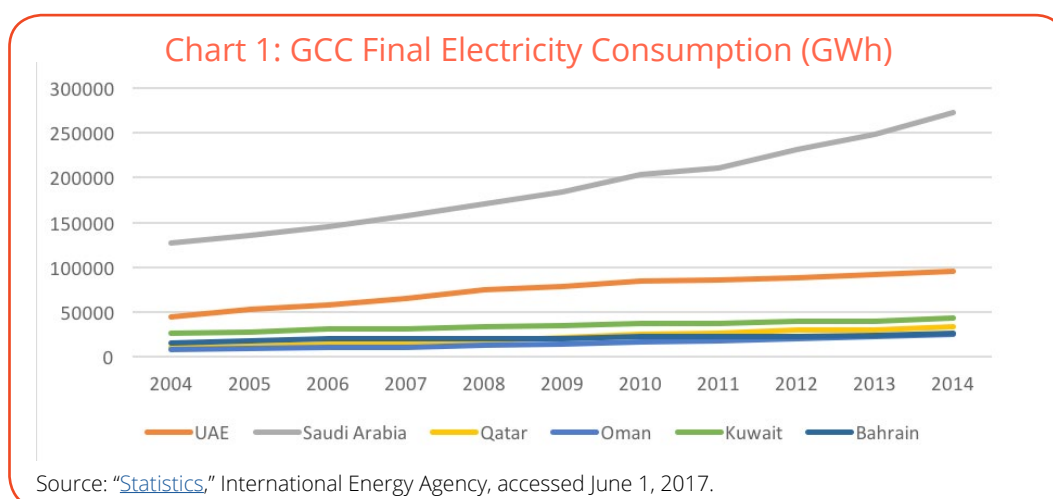
In the current context of low oil and gas revenue, there is significant opportunity for renewable energy to play a role in meeting this rising energy demand. But the opportunity is not without risks. To achieve stated renewable targets with minimal negative impacts, the GCC states will need to pursue assertive policy reform on multiple fronts simultaneously.

## Opportunities and Risks for Renewable Energy Investment in GCC States

From the perspective of GCC governments, delivery of electricity is a priority for state development, for attracting foreign investment, and ultimately for state security. In the current fiscal context, GCC countries face a complex situation of opportunity and risk in terms of seeking to meet rising energy demand, achieve stated renewables targets, and finance renewable energy projects. Some opportunities and risks are regional, while others reflect important differences within individual country cases.

### Opportunities

Some GCC states have been considering renewable energy investments for many years, even during the exceptional boom years of high oil prices. Often, this was led by projected demand growth: In 2010, for example, growth was estimated at 80 percent to 2015 – a clear indication that demand would outstrip supply and that heavy reliance on gas-fired electric plants was no longer tenable.<sup>6</sup> This prompted GCC states to investigate renewable energy markets in the GCC in 2010. In some cases, public policy priorities to diversify economies and adopt alternative sources of electricity generation predate the current oil price decline. Chart 1 details rising electricity consumption across the GCC in the past decade.

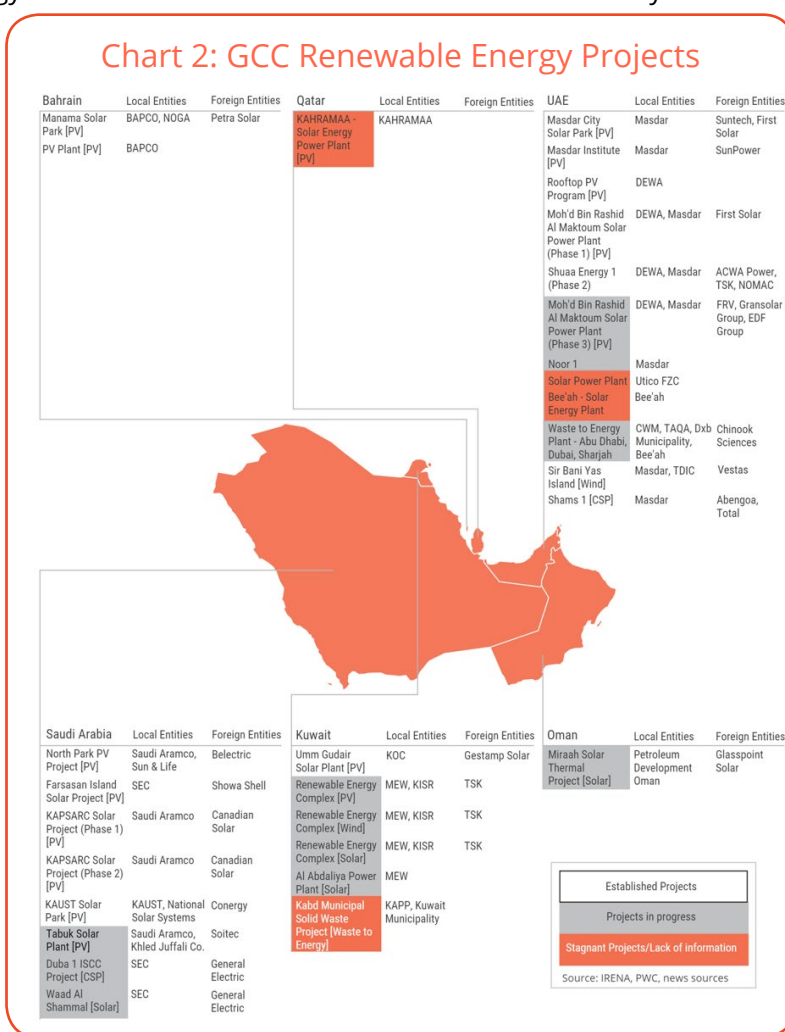


<sup>6</sup> W.E. Alnaser and N.W. Alnaser, "The Status of Renewable Energy in the GCC Countries," *Renewable and Sustainable Energy Reviews* 15, no. 6 (August 2011): 3,074-98.

The development of renewable energy technologies is likely to lower their respective implementation costs and will help solve several challenges facing the Gulf states. Tapping into an alternative source of energy for domestic use, for example, will allow governments to reserve oil and gas resources for more valuable export markets. Use of cleaner energy domestically will also reduce harmful greenhouse gases and alleviate associated impacts. But perhaps most compelling is the opportunity to embrace localized technology to support research, innovation, and ultimately job growth.

Scholars examining the potential for adopting renewable energy technologies in the GCC states present a multipronged argument that suggests various economic and social policy goals can be achieved with a limited financial investment.<sup>7</sup> The International Renewable Energy Agency (IRENA) claims that renewable energy industries in the Gulf states could create as many as 140,000 direct jobs every year.<sup>8</sup> The IRENA report also stresses how Gulf policymakers have advocated for the creation of renewable energy agencies and research organizations to help stimulate demand and domestic support for the clean energy transition.

Recently established organizations form a kind of epistemic community for renewable energy, with front-runners including Masdar in the UAE, the Dubai Supreme Council of Energy, and the King Abdullah Center for Atomic and Renewable Energy and the King Abdullah Petroleum and Research Center in Saudi Arabia. These efforts are amplified by private sector ventures such as the Arabian Company for Water and Power Development and the acquisition of Spanish solar company Fotowatio by Saudi businessman Abdul Latif Jameel.<sup>9</sup> Chart 2 highlights some of the major renewable energy production facilities in use, in construction, and stalled within the GCC states.



<sup>7</sup> Zeineb Abdmouleh, Rashid Alammari, and Adel Gastli, "Recommendations on Renewable Energy Policies for the GCC countries," *Renewable and Sustainable Energy Reviews* 50 (October 2015): 1,181-91.

<sup>8</sup> International Renewable Energy Agency, *Renewable Energy Market Analysis: The GCC Region* (Abu Dhabi: International Renewable Energy Agency, 2016).

<sup>9</sup> "Saudi Conglomerate Acquires Spanish Solar Plant Developer," *Al Arabiya*, April 8, 2015.

## Investment Risks

Despite aggressive goals and political will (in some states more than others), GCC countries have encountered obstacles to embracing renewable energy in power generation. In light of new stresses on fiscal priorities, there has been some evidence of backtracking on previous renewable energy production targets.<sup>10</sup> Despite new policy goals for sustainable domestic energy production, the economic reform process has put pressure on governments to prioritize social programs and public sector jobs over new renewable and clean energy targets and investments.

Price is also an obstacle, as building new power plants is expensive. In 2010, based on projects in the UAE, cost estimates for renewable electricity generation ranged from \$0.27 per kilowatt hour (/kWh) for ground mount PV (Photovoltaic) solar to \$0.35/kWh for roof mount.<sup>11</sup> These costs were difficult to justify to investors when citizens paid roughly \$0.01/kWh across the GCC states (or even less in Qatar). By January 2016, consultancies PwC and Eversheds advised clients that solar PV had become cheaper than gas for new power projects in the Middle East. These reports additionally indicated that renewables were politically more acceptable as part of an energy mix, rather than a replacement of other sources.<sup>12</sup>

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*The possibilities for electricity export and trading among the GCC states using an existing grid system could be positive for cost reduction to power providers, a source of revenue to exporters, and a way to share excess capacity ...*

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Ironically, a continued downward trend in the price of oil could discourage government spending in infrastructure overall, including solar power. At present, the political incentives for a renewable energy commitment are as compelling as the economic case. The more difficult targets will be standardizing distribution of electricity throughout the federation, which should be a shared goal of economic diversification and generating economic growth. The possibilities for electricity export and trading among the GCC states using an existing grid system could be positive for cost reduction to power providers, a source of revenue to exporters, and a way to share excess capacity particularly in times of peak demand during the hot summer months.<sup>13</sup>

A kind of institutional inertia is another obstacle, in that renewable and clean energy production requires policy change and commitment. With some exception in the UAE, GCC governments have shown little public policy appetite for change. This is perhaps because vested interests in the oil and gas sectors tend to dominate energy ministries

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<sup>10</sup> Wael Mahdi and Vivian Nereim, "[Saudi Arabia Scales Back Renewable Energy Goal to Favor Gas](#)," *Bloomberg*, June 7, 2016.

<sup>11</sup> W.E. Alnaser and N.W. Alnaser, "The Status of Renewable Energy in the GCC Countries," *Renewable and Sustainable Energy Reviews* 15, no. 6 (August 2011): 3,074-98.

<sup>12</sup> Michelle Davies, Bethan Hodge, Shakeeb Ahmad, and Yanxiang Wang, "[Developing Renewable Energy Projects: A Guide to Achieving Success in the Middle East](#)," *Eversheds & PwC*, January 2016.

<sup>13</sup> Dania Saadi, "[Power Swap on Cards for Gulf Countries](#)," *The National*, December 23, 2014.

with set practices and preferences for power production, even when these preferences might be at odds with the overall goal of increasing oil and gas export revenue, which could be achieved by shifting to more renewables for domestic consumption.

In just five years, movement in price and perception is evident, reflecting the decline in oil revenue, readiness among policymakers<sup>14</sup> and national utilities to embrace change, and a global change in finance mechanisms. Gulf states are open to the idea of renewable and clean energy production, but they need two key elements to make it happen: domestic institutional commitment to policy change and financing, with an acceptable level of shared risk to the government and local or foreign investors. There are also significant hurdles in the regulation of risk sharing between private and public enterprises in the Gulf states, as the tradition of state-owned utilities is only beginning to shift toward partnership and private operation models.

## Legal Frameworks, Ownership Structures, and Financial Products

The Gulf region appears ready for the idea of renewable energy and prepared to secure the financing needed to make it feasible.<sup>15</sup> At present, however, the region has only a limited set of legal frameworks that allow potential partners to share risk in large infrastructure investments.<sup>16</sup> Additionally, availability of and access to financial products, including Islamic bonds and other sharia-compliant finance structures, varies across countries.

The necessity of legal and financial sector reform across the GCC states was evident before fiscal pressure heightened.<sup>17</sup> Some states began implementing reform agendas years ago. Privatization of utilities, especially water, for example, began in the late 1990s through local joint ventures between state-owned or state-related entities and private companies, often through build-operate-transfer schemes.

In the financing of large infrastructure projects, there are a number of scenarios or arrangements to share risk and cost. The World Bank defines a public-private partnership (PPP) as “a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance.”<sup>18</sup> The extent of involvement from

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<sup>14</sup> Johan Lilliestam and Anthony Patt, “[Barriers, Risks and Policies for Renewables in the Gulf States](#),” *Energies* 8 (August 2015): 8,263-85.

<sup>15</sup> Md. Alam Hossain Mondal, Diala Hawila, Scott Kennedy, and Toufic Mezher, “The GCC Countries RE-readiness: Strengths and Gaps for Development of Renewable Energy Technologies,” *Renewable and Sustainable Energy Reviews* 54 (February 2016): 1,114-28.

<sup>16</sup> James Morgan, “[GCC Projects Finance is Set to Change in a Big Way](#),” *Construction Week Online*, March 25, 2017.

<sup>17</sup> Karen Young, “Markets Serving States: The Institutional Bases of Financial Governance in the Gulf Cooperation Council States,” *Kuwait Programme on Development, Governance and Globalisation in the Gulf States* 38 (London: London School of Economics and Political Science, 2015).

<sup>18</sup> “[What are Public Private Partnerships?](#)” *World Bank Group*, accessed March 23, 2017.

inception to construction, management, financing, and joint ownership is set by contractual terms.<sup>19</sup> Any involvement beyond a service contract and short of privatization could be deemed a PPP.



The recent crisis has legitimated the reform logic, especially in diversification strategies that include renewable energy production targets, and intensified the speed of fiscal and labor market reforms. Because revenue can be generated from the sale, service, and management of public entities, utilities become large targets in fiscal reform. Given the pressing need for a more efficient and flexible method of state-led growth, the reform process may now gain momentum. This is evidenced by recent action on two mechanisms Gulf states are considering to substantially lower the cost of providing energy and water: reduction of subsidies, taxes, and fees; and privatization (Table 1).<sup>20</sup> For some states, the challenge is more immediate than for others.

In debt capital markets in the GCC states, there is room for expansion of products that would help finance private sector efforts to partner in many economic sectors, not the least in providing local power production. According to a recent report by Moody's, limited (corporate) bond issuance historically coupled with a heavy presence of state investments across a variety of sectors, most evident in construction, real estate, and infrastructure (including energy), has meant that capital markets are not well-developed. Simply put, there are not many finance tools for private investors and businesses to use to put together large projects because the dominant source of finance is local bank loans. There are more creative ways to finance large projects in the energy sector, including ways to divide ownership and operation roles and the provision of new technology. The logic driving the creation of new kinds of financing is in large part the proliferation of Gulf states' own financing needs. Gulf states have been issuing their own debt, to both local and international markets, to meet these needs.

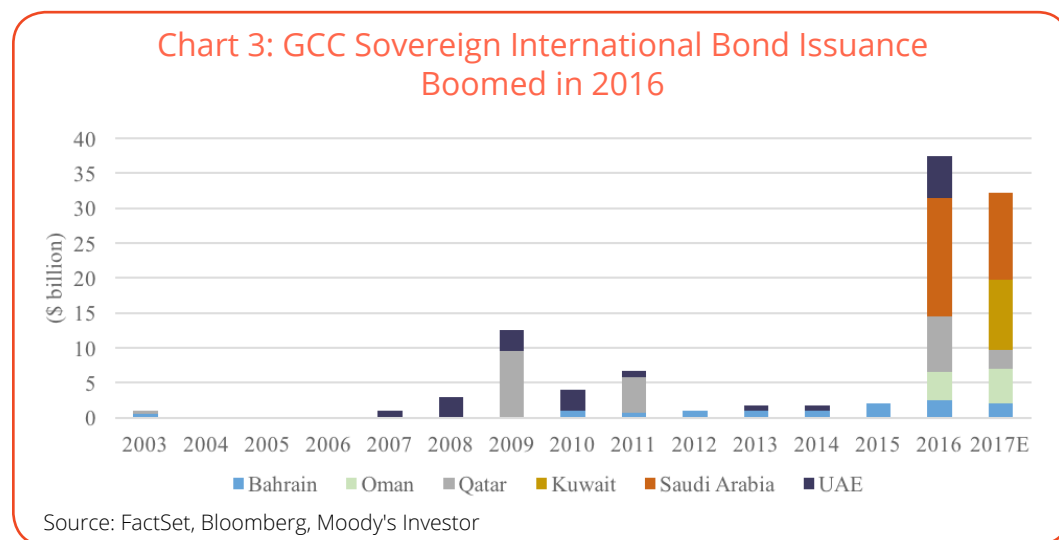
<sup>19</sup> "PPP Arrangements / Types of Public-Private Partnership Agreements," World Bank Group, accessed March 23, 2017.

<sup>20</sup> Glada Lahn, "Fuel, Food and the Utilities Price Reforms in the GCC: A Wake-Up Call for Business," Chatham House, June 8, 2016.

**Table 1: GCC Non-Oil Revenue Reforms Agenda (2015-21)**

		VAT	Excise	Others
Bahrain	Measure (Implementation date)	VAT at 5% (2018)	NA	<ul style="list-style-type: none"> <li>Increase EWA admin fees, sand mining fees, hotel services fees, cost recovery on municipalities, and fee on sand extraction (2016)</li> <li>Fees on alcohol and tobacco (2016)</li> </ul>
Kuwait	Measure (Implementation date)	VAT at 5% (2018)	NA	<ul style="list-style-type: none"> <li>Business profit tax</li> </ul>
Oman	Measure (Implementation date)	VAT at 5% (2018)	NA	<ul style="list-style-type: none"> <li>Increase civil aviation fees and other fees (2015)</li> <li>Training tax and municipal tax on rents (2016)</li> <li>Increase in corporate income tax from 12 to 15% and remove the threshold (2017)</li> </ul>
Qatar	Measure (Implementation date)	VAT at 5% (2018)	Excise on tobacco, energy, and soft drinks (2017)	<ul style="list-style-type: none"> <li>Increase water and electricity tariffs (2015)</li> <li>Increase gasoline price (2016)</li> <li>Introduction of pricing mechanism to revise fuel prices regularly (2016)</li> </ul>
Saudi Arabia	Measure (Implementation date)	VAT at 5% (2018)	Excise on tobacco, energy, and soft drinks (2017)	<ul style="list-style-type: none"> <li>Increase visa fees except for Haj and Umrah (effective Oct. 2, 2016)</li> <li>Introduction of white land taxes</li> </ul>
UAE	Measure (Implementation date)	VAT at 5% (2018)	NA	<ul style="list-style-type: none"> <li>Introduction of a 3% municipal fee on expat property rental in Abu Dhabi (2016)</li> <li>Increase government fees for intellectual property rights registration, including trademarks, patents, copyrights, and designs (2015)</li> <li>Fees on alcohol and tobacco (2015)</li> </ul>

Ultimately, development of the legal and financial frameworks that enable shared investment will determine how large investments in energy and water provision will move forward. The next section highlights various efforts in different countries to initiate reform.



## Electricity and Water Subsidy Reform

Relying on national hydrocarbon resources, which are in ready supply, GCC governments have been able to supply power and water to their customers at relatively low cost to national budgets. Additionally, keeping charges to customers low has been seen as a way to share the wealth generated by resource revenue.

In Kuwait, water prices have been fixed for nationals and non-nationals at the same rate for 40 years, thus becoming increasingly subsidized with the passing of time. In the 1970s, water was free to all households in Abu Dhabi; this changed somewhat in the early 1990s, also in a time of depressed oil prices, when non-nationals were made to pay for water.<sup>21</sup> Current pricing is bifurcated, with costs to Emirati nationals still highly subsidized and noncitizen residents paying much higher rates.<sup>22</sup> Under the new fiscal constraints, pricing of water and electricity has become contentious in the Gulf states. In the case of electricity, it is affected by factors such as the price of land, lease of land, facility construction, and ability to connect to a national grid system.

<sup>21</sup> Laurent A. Lambert, *Water, State Power, and Tribal Politics in the GCC: The Case of Kuwait and Abu Dhabi* (Doha: Georgetown University School of Foreign Service in Qatar, 2014).

<sup>22</sup> Naser Al Wasmi, "Abu Dhabi Residents Brace for Utility Price Hike," *The National*, December 24, 2014.

Since mid-2016, the government of Bahrain has been negotiating with members of Parliament to remove water and electricity subsidies to non-nationals and private sector businesses.<sup>23</sup> By the last quarter of the year, all GCC states had embarked on a subsidy reform process, with differing levels of success in implementation.

## Reform of Ownership Structures: Privatization

Gulf states are also amending laws on lending and forming new mechanisms to encourage private investment in utilities and infrastructure projects. One model of PPP allows for joint or shared ownership of a plant between a government entity and a private investor (or set of investors) and/or developers or operators. Another option, the engineering, procurement, and construction model, rests solely on the design and construction of the power plant itself. Ownership remains solely in the hands of the state. The independent power producer (IPP) model separates construction and ownership of the plant from the electricity distributor, but involves a contractual agreement on the purchase of the electricity to be generated.

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*By 2010, some 95 percent of desalinated water in Abu Dhabi was produced through PPPs.*

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Abu Dhabi launched the first PPP in the GCC water sector in 1999 with the creation of the Abu Dhabi Water and Electricity Authority. By 2010, some 95 percent of desalinated water in Abu Dhabi was produced through PPPs.<sup>24</sup>

In 2005, an Omani decree (Royal Decree 42/96) encouraged privatization by separating the energy ministry's responsibility for electricity generation from that of new entities that can participate in generation and distribution of power.<sup>25</sup> Under this type of privatization scheme, the state maintains its role in the procurement of power but privatizes generation and transmission to PPP entities.

Starting in 2014, new laws in Dubai<sup>26</sup> and Kuwait granted ownership stakes in and revenue from assets to investors who fund origination costs for these kinds of infrastructure and utility projects.<sup>27</sup> Various GCC countries have taken recent efforts to amend or create new PPP regulations, develop outlines for build-operate-transfer schemes, or stimulate full-on privatization proposals in which IPPs operate in place of – or in competition with – state-owned utilities.

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<sup>23</sup> "Bahrain to Scrap Power Subsidies for Expats, Big Businesses," *Arabian Business*, November 23, 2015.

<sup>24</sup> Laurent A. Lambert, *Water, State Power, and Tribal Politics in the GCC: The Case of Kuwait and Abu Dhabi* (Doha: Georgetown University School of Foreign Service in Qatar, 2014).

<sup>25</sup> Ibp Inc, *Oman Energy Policy, Laws and Regulations Handbook: Volume 1 Strategic Information and Basic Laws* (Muscat: Lulu, 2015).

<sup>26</sup> Adam Bouyamourn, "New Dubai Law to Foster Public-Private Partnerships for Infrastructure Funding," *The National*, August 18, 2015.

<sup>27</sup> Sadallah Ali and Abdullah Masud, "The New Kuwait PPP Law," *Al Tamimi & Co.*, October 2014.



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## Saudi Arabia

In Saudi Arabia, where the state depends heavily on oil revenue for social spending and public sector salaries, the economic reform agenda is pressing. With substantially reduced revenue, the state has had to sell reserve assets and turn to debt issuance to cover expenses. The structure of the most recent fiscal budget aims to secure more revenue from fees and the sale of government assets, including the privatization and public offering of part (most likely a 5 percent stake) of Aramco, the state oil company.<sup>28</sup>

Saudi Arabia has also announced the privatization of its airport in Jeddah, following the successful privatization (under a build-transfer-operate scheme) of the Medina airport in a 25-year concession led by Turkish holding group Havalimanlari in exchange for \$1.2 billion.<sup>29</sup>

In water distribution, Saudi Arabia has a precedent for independent producers acting in partnership with the state utility.<sup>30</sup> In August 2014, the International Finance Corporation invested \$100 million in equity in Saudi Arabia's water and power project developer, the Arabian Company for Water and Power Development (ACWA).<sup>31</sup> The investment also sought to spur regional development projects in the Middle East and North Africa by new private players.

Yet state interests in these limited companies, such as ACWA, demonstrate how the Saudi public sector has yet to fully release private operators and investors from its grasp. By late 2016, the Saudi Public Investment Fund had shown an interest in buying a stake in ACWA, which would limit the entity's ability to truly be a private developer in the Saudi domestic market.<sup>32</sup>

There is enormous wealth within Saudi state assets, but short-term liquidity could become a problem. There is no PPP law in Saudi Arabia. Thus, it is not clear yet from the National Transformation Program or Vision 2030 how PPPs might move forward, or how privatizations will be managed as parts or assets of the Saudi Electricity Company, for example. The kingdom has had some success with IPPs, but always with the Saudi Electricity Company retaining a 50 percent share.<sup>33</sup>

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<sup>28</sup> Patrick W. Ryan, "Saudi Aramco IPO Signals Serious Economic Reform Prospects," *Al Arabiya*, April 2, 2016.

<sup>29</sup> "TAV to Boost Stake in Saudi Airport Operator," *Trade Arabia*, September 6, 2016.

<sup>30</sup> "SWEC Shareholders Structure," Shuaibah IWPP, accessed June 1, 2017.

<sup>31</sup> Lama Kiyasseh, "Mobilizing Private Investment in Saudi Infrastructure," *Arab Gulf States Institute in Washington*, November 2, 2016.

<sup>32</sup> Hadeel Al Sayegh and Reem Shamseddine, "Exclusive: Saudi Sovereign Fund PIF Considers Buying Stake in Power Firm ACWA," *Reuters*, November 14, 2016.

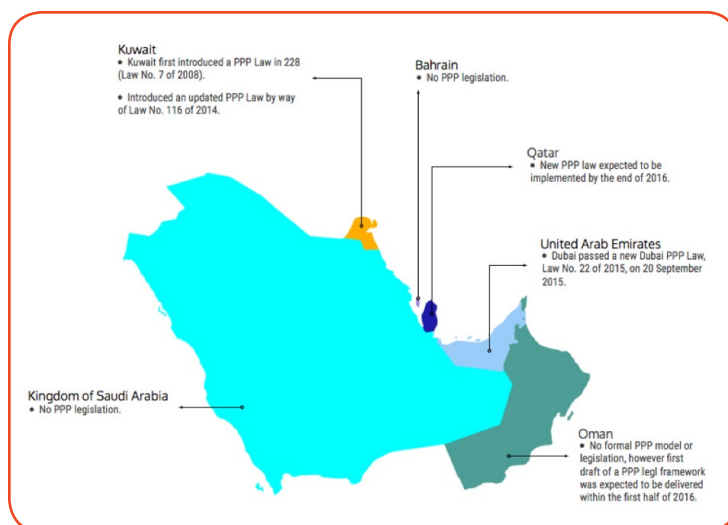
<sup>33</sup> Lama Kiyasseh, "Mobilizing Private Investment in Saudi Infrastructure," *Arab Gulf States Institute in Washington*, November 2, 2016.

## Kuwait

Kuwait's advanced PPP law,<sup>34</sup> established in 2014, led to the establishment of the Kuwait Authority for Public Partnerships, which has a mandate to formalize government policy in this area. The law sets out how external investors can participate in profit sharing while also putting in place stringent rules on foreign ownership of shared ventures.

Article 13 of Law 116 of the 2014 PPP regulations requires, for example, that the equity of a public joint stock project be divided carefully among public authorities, winning investors, and public subscription offers to Kuwaiti citizens. In a sell-off via PPP for any project of more than 60 million Kuwaiti dinars (approximately \$150 million), the public authority is limited to no more than 24 percent of an entity and the investor must take on at least 26 percent of shares. The authority must offer 50 percent of shares to Kuwaiti citizens in a public offering.

In this regulation, Kuwait has set two important precedents in its liberalization and efforts to attract foreign investment. First, it has prioritized and reserved opportunities for Kuwaiti citizens to benefit from the profit of sales of state assets. For example, if a utility is to be built under this scheme, the new company created would be more than 75 percent investor owned, with the largest portion held by citizen investors. The government has been careful to limit its own potential gains on such large investments – and to minimize its risks.



Frameworks for PPP investments are not nearly as developed in other parts of the GCC.

## Qatar

In Qatar, economic reform and privatization are included in an overall vision of good governance, according to the emir's address to the Advisory Council in November 2015. Emir Sheikh Tamim bin Hamad al-Thani stressed the need to diversify the economy and limit the state's competition with the private sector, including that "subsidies for a number of these companies be ceased, and some to be privatized, and management of some be transferred to the private sector, and government corporations and companies not to compete with the private sector, and opportunities for this sector to implement government projects be

<sup>34</sup> Sherif Shawki, Abdel-Fattah, and Dean Kern, "Kuwait: Public Private Partnership Law – An Introduction," *PwC*, October 2015.

enforced.”<sup>35</sup> Qatar allows a hundred percent foreign ownership of corporate entities, but land rights are an issue. For utility providers, there is little competition, as the state-owned utility, KAHRAMAA, dominates the market and controls grid access.

## United Arab Emirates

In the United Arab Emirates, current law requires at least 51 percent ownership by the state or a UAE national for any corporate entity, unless in a free zone, where private foreign businesses can operate without a local agent.<sup>36</sup> The UAE has implemented many IPP models for electricity plants, as well as contracts for design and operation of large utilities, but does not allow outright ownership.

In the event that external financing is needed, each of these joint ownership structures raises questions of liability, credit worthiness, and ownership of collateral.

## Funding Innovation

Securing financing so far has not been a major barrier to large renewable energy projects in the GCC states. A number of renewable energy projects in the GCC states have used government and public-private partnership finance models, demonstrating a strong industry and investor interest in the region. Some innovative new partnerships demonstrate possibilities in shared ownership and financing. The Shuaa Energy 1 (Phase two of Mohammed Bin Rashid Al Maktoum Solar Power Plant)<sup>37</sup> is one example. The ownership structure is of an IPP model, such that the state utility, the Dubai Electricity and Water Authority, has shared majority ownership with independent power company ACWA Power International, and the Spanish engineering and construction business TSK holds the rest of the shares, in a 51 to 49 percent ownership split.<sup>38</sup> The project was financed mainly through debt using regional banks, First Gulf Bank and two banks based in Saudi Arabia, to lend nearly \$350 million.<sup>39</sup>

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*In the GCC context, sukuks (Islamic bonds) are one of the most important financing sources.*

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One challenge to financing is that states are confined by local Islamic law from extending interest payments to investors and, in return, creating a source of collateral (in land or assets owned by the state) that can be dispersed in the event of bankruptcy or failure of a project.

In the GCC context, sukuks (Islamic bonds) are one of the most important financing sources. These bonds meet the criteria of Islamic law in that they are not meant to accrue interest, but rather share the risk and ownership of tangible assets through a joint investment endeavor.<sup>40</sup> Green sukuks (green bonds) are a novel financing option. These are targeted investments for

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<sup>35</sup> “Emir Inaugurates Advisory Council’s 44th Ordinary Session,” *The Peninsula*, November 3, 2015.

<sup>36</sup> “Doing Business in the UAE: A Tax and Legal Guide,” *PwC*, 2015.

<sup>37</sup> License # EG-01/2015 granted to Shuaa Energy 1 PSC, *Regulatory and Supervisory Bureau for Electricity and Water Sector* (Dubai: June 2015).

<sup>38</sup> “DEWA Reaches Financial Close for 200-MW Solar Project in Dubai,” *Renewables Now*, July 20, 2015.

<sup>39</sup> Smriti Mittal, “World’s Cheapest Solar Power Project in Dubai Achieves Financial Closure,” *Clean Technica*, July 21, 2015.

<sup>40</sup> Mai Mahmoud, “Gulf Islamic Finance in a Time of Austerity,” *Arab Gulf States Institute in Washington*, June 15, 2016.

an environmental purpose,<sup>41</sup> in which the “green investment” is made in companies, projects, and financial instruments that support projects in renewable energy, clean technology, or low-carbon or climate-resilient actions. The projects are screened according to environmental, social, and governance criteria. These niche investment vehicles attract long-term investors and those with institutional commitments to environmentally-friendly investments, as many large pension funds now prefer.

In Saudi Arabia, public sector entities, including the Saudi Electricity Company, are using sukuk to fund new power plant construction.<sup>42</sup> Smaller scale ventures, especially in the solar PV market, have found it more difficult to secure financing or investments.<sup>43</sup> There have been some successful examples in government sourced funding, as in Dubai’s plans to establish a \$27 billion Dubai Green Fund,<sup>44</sup> providing soft loans for investors in the sector. The \$3.2 billion Mohammed bin Rashid Al Maktoum Solar Park is self-funded by members of the Dubai Supreme Council of Energy. Masdar announced that it will invest up to \$1.6 billion in alternative energy projects alongside the United Kingdom’s Green Investment Bank.<sup>45</sup>

In other GCC states, such as Oman and Bahrain, the funding gap could be more severe. According to the World Bank, in 2016 the debt-to-gross domestic product ratio in Bahrain was above 83 percent, a dramatic increase from 44 percent in 2014. With such a high (by regional standard) debt-to-GDP ratio, Bahrain is now in breach of the GCC criteria for a currency union (though that system is far from implementation).<sup>46</sup> At \$107.20 per barrel in 2015, Bahrain’s fiscal break even price for oil production is much higher than most of its GCC neighbors.<sup>47</sup>

Between late 2014 and mid-2016, oil exporters in the Middle East and North Africa lost more than \$800 billion in revenue compared to the highs of 2003-14, when governments had become comfortable with high levels of domestic spending.<sup>48</sup> The sharp downturn in fiscal positions has spurred changes in fiscal policy on energy, fuel, and water subsidies, and prompted the introduction of a plan for a value added sales tax across the GCC states.

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<sup>41</sup> Kankana Dubey, Steven Fawkes, Nicholas Howarth, Moncef Krarti, and Padu S. Padmanabhan, “[Investing for Energy Productivity in the GCC: Financing the Transition](#),” *King Abdullah Petroleum Studies and Research Center*, September 2016.

<sup>42</sup> Said A. Al Shaikh and Lama Kiyasseh, “[The Kingdom’s Power Sector is Succeeding in Diversifying Sources of Funding to Meet Future Demand](#),” *National Commercial Bank*, December, 2011.

<sup>43</sup> International Renewable Energy Agency, *Renewable Energy Market Analysis: The GCC Region* (Abu Dhabi: International Renewable Energy Agency, 2016; See also, “[Financing the Future of Energy](#),” *University of Cambridge and PwC*, March 2015.

<sup>44</sup> Parag Deulgaonkar, “[DEWA to Invite Global Funds to Invest in \\$27bn Dubai Green Fund](#),” *Arabian Business*, October 6, 2016.

<sup>45</sup> Joshua Meltzer, Nathan Hultman, and Claire Langley, “[Low-Carbon Energy Transitions in Qatar and the Gulf Cooperation Council Region](#),” *Brookings Institution*, February 2014, 48.

<sup>46</sup> Khalid Shams Abdulqader, “[GCC’s Economic Cooperation and Integration: Achievements and Hurdles](#),” *Al Jazeera Centre for Studies*, March 31, 2015.

<sup>47</sup> “[Bahrain’s Economic Outlook – July 2016](#),” *The World Bank*, July 2016.

<sup>48</sup> Aya Batrawy, “[IMF Expects \\$500B Loss for Mideast Oil Exporters](#),” *Associated Press*, April 25, 2016.

Kuwait, like all GCC states, is struggling to meet fiscal outlays with a reduced oil revenue stream. It is, however, better positioned than many of its neighbors as it has a lower break even price for oil, partly because the country's geology makes its oil easily accessible.<sup>49</sup> Perhaps more relevant to the current context, Kuwait has traditionally spent less on domestic infrastructure and large development projects, and over the last decade has opted instead to direct much of its savings<sup>50</sup> into its sovereign wealth funds. However, as investors lament<sup>51</sup> and the World Bank Ease of Doing Business<sup>52</sup> reports have tracked, Kuwait has been a difficult place to stimulate economic growth. The resistance to spend on public works in a time of fiscal austerity might be viewed as prudent, but in fact, Kuwait is now caught in a case of poor timing. Government spending commitments increased in 2015 to remedy the lag in infrastructure development just as oil revenue dropped.<sup>53</sup> Kuwait has been on track since 2011 to increase its non-oil sources of revenue, though the recent decline in oil prices seems to have dampened the economy as a whole and diminished the diversification effort.

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*The resistance to spend on public works in a time of fiscal austerity might be viewed as prudent, but in fact, Kuwait is now caught in a case of poor timing.*

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Considering they are all, to some degree, in the same boat, the six GCC states may be in a good position to share learning as they each navigate through this unfamiliar territory of structural reform. Potential partners from the international investment community are watching closely to gauge how these projects will be financed and how stable the partnerships can be. As seen in Saudi Arabia's partnership with the International Finance Corporation, some are investing alongside renewable PPP ventures.<sup>54</sup>

Some of the limitations of these products, and financing in general for smaller scale projects, is the institutional capacity within the local finance sector to evaluate risk and extend credit.

## Renewable Energy Policy Frameworks and Industry Support Nexus

To achieve stated renewable targets, the current GCC policy environment must bring together a strengthening research and development community with a nascent private sector of investors and developers. Important progress is already evident in key areas. Local manufacturing, particularly in solar capacity, is growing and will likely expand as the scale of projects increases, and the possibility of feed in from rooftop and smaller scale solar electricity becomes technically feasible.

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<sup>49</sup> Karen E. Young, "[The Irony of Kuwait's Economic Reform Agenda](#)," *Arab Gulf States Institute in Washington*, October 18, 2016.

<sup>50</sup> Hessah Al-Ojayan, "[Treating the Oil Addiction in Kuwait: Proposals for Economic Reform](#)," *LSE Kuwait Programme Paper Series* 41 (London: LSE, 2016).

<sup>51</sup> Sylvia Westall and Mirna Sleiman, "[Mideast Money – Rich but Backward: Politics, Oil Poison Kuwait Economy](#)," *Reuters*, November 14, 2012.

<sup>52</sup> "[Ease of Doing Business in Kuwait](#)," *The World Bank*, accessed June 1, 2017.

<sup>53</sup> "[Kuwait Approves \\$10 Billion Infrastructure Projects](#)," *Reuters*, August 15, 2015.

<sup>54</sup> "[IFC in Saudi Arabia](#)," International Finance Corporation, accessed June 1, 2017.

The policy frameworks to support growth of the renewables industry vary across the GCC states and are still developing as new finance tools emerge and new legislation is passed to secure transactions and investments. The primary motivation is to move away from solely state-owned investment in the power sector, starting with auction processes for procurement of both capacity and energy.<sup>55</sup>

## Response to Reforms

Despite recognition of the need for economic diversification and fiscal reform in the GCC states, not all efforts have been well-received. In fact, public criticism of reforms has prompted strong action, including one instance in which the Saudi government fired the minister for water after receiving complaints about tariff increases in April 2016.<sup>56</sup> The higher tariffs, however, remained in place.

Kuwait has shown a mix of measured steps forward and subsequent backtracking, with the involvement of Parliament and a court case that found the reduction of petrol subsidies to be illegal. On October 16, 2016, Kuwait's Emir Sheikh Sabah al-Ahmed al-Sabah dissolved Parliament,<sup>57</sup> citing concerns about security and finances in an era of reduced oil revenue. However, in the November 2016 elections more candidates critical of the reform process were voted into office.<sup>58</sup>

To date, few GCC governments have been proactive in efforts to introduce conservation ethics and promote better public understanding of related issues such as the true cost of water and utilities, and the potential impact of renewables. Dubai is likely the most innovative in this sense, with a public campaign about conservation predating the 2014 drop in oil prices, along with information about solar power plant construction and renewable targets.<sup>59</sup> Abu Dhabi has taken a longer and more protracted path toward a public articulation of its commitment to renewables and conservation, though efforts have vastly accelerated since 2011.<sup>60</sup> The UAE case is instructive in its early political and investment commitment to renewables, efforts to institutionalize renewable energy policy as part of an initiative to accommodate global norms (through the headquarters of IRENA in Abu Dhabi), and ability to seize the economic rationale for energy price reform in a time of fiscal austerity.

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<sup>55</sup> For a historical view of why there has been little interest from GCC policymakers in renewable energy production, see: Konstantinos Patlizianas, Haris Doukas, and John Psarras, "Enhancing Renewable Energy in the Arab States of the Gulf: Constraints and Efforts," *Energy Policy* 34, no. 18 (Athens: National Technical University of Athens, 2006): 3,719-26.

<sup>56</sup> Glen Carey and Zaid Sabah, "[Saudi King Fires Water Minister after Complaints over Tariffs](#)," *Bloomberg*, April 24, 2016.

<sup>57</sup> "[Kuwait's Ruler Dissolves Parliament, Citing Security and Oil Prices](#)," *The New York Times*, October 16, 2016.

<sup>58</sup> Kristin Smith Diwan, "[Kuwait's Snap Parliamentary Elections Bring Return of the Opposition](#)," *Arab Gulf States Institute in Washington*, November 29, 2016.

<sup>59</sup> Noor Ghazal Aswad, Yasser Al-Saleh, and Hanan Taleb, "[Clean Energy Awareness Campaigns in the UAE: An Awareness Promoters Perspective](#)," *International Journal of Innovation and Knowledge Management in Middle East & North Africa* 2, no. 2 (2013).

<sup>60</sup> Jim Krane, "[The Political Economy of Abu Dhabi's Pursuits in Renewable Energy](#)," *JIME-IEE Japan*, July 2012; See also Jim Krane, "[An Expensive Diversion: Abu Dhabi's Renewable Energy Investments Amid a Context of Challenging Demand](#)," *James A. Baker III Institute for Public Policy, Rice University*, February 11, 2014.

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## Case Study of the UAE

The UAE's commitment to renewable energy production is driven primarily by economic and political motivations. In fact, the goal of economic growth and diversification is fiscally prudent and also politically salient to both domestic actors and international allies and investors. The economic reform measures undertaken recognize the traditional rentier Gulf economy does not work in the 21st century because of drastic changes in demographics (including rapid national and expatriate population growth), the reality of a finite supply of oil, and the instability of global energy demand.

Various recent actions signal the UAE's commitment to renewable energy. The decision to host IRENA firmly established the UAE as a global leader in the clean energy transition, boosting the state's global brand and attracting industry. Similarly, Abu Dhabi's Masdar City, a planned city/research facility that relies on renewable energy, and Shams 1, the largest concentrated solar power (CSP) plant in the world, demonstrate a political commitment to lead the emerging industry.

Other motivations for pursuing renewables in the UAE are perhaps more complex. To keep pace with demand growth, electricity generation in the UAE quintupled between 1991 and 2010, reflecting an average growth of 8.5 percent per year. More than 90 percent of electricity produced in the UAE is generated by coal- or gas-fired plants.<sup>61</sup> But unlike in neighboring Kuwait and Saudi Arabia, which are able to use domestic oil to produce as much as half of their electricity, the UAE imports nearly all of its natural gas supply from Qatar in long-term contracts. This requires a massive infrastructure investment. Energy independence for the UAE, at least from Qatari natural gas, may be a political and economic objective. Saudi efforts to increase natural gas production follow a similar rationale.<sup>62</sup>

Renewable energy, especially solar (PV and CSP) has become less expensive to produce. On the global market, solar technology now delivers power at prices comparable to traditional electricity plants. While the economics of large-scale solar were not cost saving at the time of constructing Shams 1 in Abu Dhabi, less than 10 years later, the new 200 megawatt (MW) solar PV plant in Dubai, operated by ACWA, produces power at \$.059/kWh.<sup>63</sup> Expanding solar power electricity generation now makes both political and economic sense, particularly since Gulf governments are reducing electricity subsidies, the price that consumers will pay for either renewable or traditionally produced electricity will be more in line with international prices. Comparative pricing for fuel and electricity within the GCC states and the United States is listed in Table 2. U.S. costs are estimated at pretax levels, meaning that upward variation by state can be considerable, especially on fuel costs.

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<sup>61</sup> Karen E. Young, "[Why Renewable Energy Makes Sense for the UAE](#)," *Arab Gulf States Institute in Washington*, November 5, 2015.

<sup>62</sup> Robert Mabro, "[Saudi Arabia's Natural Gas: A Glimpse at Complex Issues](#)," *The Oxford Institute for Energy Studies*, accessed December 2, 2016.

<sup>63</sup> Moritz Borgmann, "[Dubai Shatters All Records for Cost of Solar with Earth's Largest Solar Power Plant](#)," *Apricum*, May 2, 2016.

**Table 2: Prices for Energy Products – GCC and the United States (Jan.–Aug. 2015)**

	Gasoline	Diesel	Natural Gas	Electricity
	U.S. dollars per liter		U.S. dollars per MMBtu*	U.S. dollars per kWh**
Bahrain	0.27	0.27	2.50	0.03
Kuwait	0.24	0.39	1.50	0.01
Oman	0.31	0.38	3.00	0.04
Qatar	0.27	0.27	0.75	0.05
Saudi Arabia	0.14	0.06	0.75	0.09
UAE	0.59	0.56	0.75	0.10
GCC Average	0.30	0.32	1.54	0.05
GCC Maximum	0.59	0.56	3.00	0.10
USA Pretax	0.53	0.64	2.80	0.10

Prices in GCC countries come from GlobalPetrolPrices.com, government agencies, and country authorities. U.S. gasoline and diesel prices come from the International Energy Agency. Natural gas prices for the United States is spot prices at Henry Hub taken from World Bank Commodity Price Data. Electricity tariffs for the United States include taxes and come from the U.S. Energy Information Administration.

\*million British thermal units

\*\*kilowatt hour

The rationale for solar power in the UAE is strengthened because of the structure of the federation and the individual emirate ownership of utilities. Abu Dhabi holds and produces as much as 94 percent of the country's oil and 90 percent of its natural gas, representing 8 percent and 3.5 percent of global reserves, respectively.<sup>64</sup> Yet the UAE became a net importer of natural gas in 2008 because of the high demand for gas in oil production and electricity generation, and the difficult (high sulfur) composition of domestic gas.

Dubai is somewhat unique among the emirates in that its economic model relies on trade and industry, rather than the export of oil. As such, electricity generation (and sale to consumers) is central to its ability to grow. This boosts the incentive to develop renewable energy sources that do not require costly imported gas or coal with its dirty emissions.

The structure of the UAE federation, however, creates some impediments to efficient electricity distribution. The northern emirates, especially Sharjah, rely on an electric grid that is managed from Abu Dhabi. In the summer months, Sharjah often experiences electricity shortages although Abu Dhabi shows no correlated problem in generation. Solar energy production will require investment in connecting to the distribution grid and more efficient distribution among the emirates, but this problem needs to be resolved for the current supply as well, so it should not be considered an additional cost.

<sup>64</sup> Jim Krane, "An Expensive Diversion: Abu Dhabi's Renewable Energy Investments Amid a Context of Challenging Demand," James A. Baker III Institute for Public Policy, Rice University, February 11, 2014.



Renewable energy targets vary by emirate in the UAE, but are ambitious for the region. As of 2013, Dubai aimed for 5 percent of renewable product by 2020, but has since committed to as much as 7 percent, matching Abu Dhabi's 2020 target.<sup>65</sup> Meeting these targets will require government commitment to investment in solar technology, new electricity plants, and infrastructure.

## Conclusion: Future Gulf Renewable Energy Opportunity and Risk

In the GCC transition to renewable energy, much is at stake. The sector has the potential to solve some very critical problems for Gulf states in cost saving, preserving natural resources, and building new institutional pathways for policy problem solving. But it will need to navigate a series of renegotiations between state, business, and society.

As oil prices seem likely to stabilize at "new normal" levels well below the highs of the last decade, and global growth is expected to be sluggish, GCC states will face more constraints in their fiscal policies and, in turn, their energy policies. Renewable energy now has the advantage of its cost saving logic, especially when states are more willing to access external finance for its construction and distribution.

Additionally, opportunities for intergovernmental cooperation and feed in to the regional GCC power grid could provide competition and cost saving, while also fostering better cooperation among states. Greater cooperation could also increase tensions, especially when electricity generation and use are tied to long-term contracts and provision of natural gas. Any failed project, in construction completion or bankruptcy, will test legal systems and the new investment climate.

A future in which renewable energy is provided through PPPs and other schemes is new territory in Gulf state-society relations. States will also face tests of their abilities to manage new partnerships and structures of ownership of utilities and their distribution networks. The main test may be how citizens respond to price increases and new providers that are nonstate entities. Citizens may demand better service delivery and blame governments (and new corporates) if they perceive any failures arising. The social contract may not be changing outright, but a negotiation is taking place that shifts the focus of Gulf societies and leaderships to prioritizing economic efficiency.

The current climate of fiscal austerity, in which all of the GCC states face deficits due to declining oil and gas revenue, is stimulating a new consensus for economic reform. It could also prompt some important institutional changes in the Gulf states' political economy, including major changes in financial regulation and greater openness to foreign investment.

The effect is not a weakening of the state, but a more complex understanding of state-business relations that acknowledges the usefulness of private sector funding and long-term investors, especially in bonds and sukuk. This shift in governance and economic development policy for Gulf states is a major change, which political analysts and investors will watch closely.

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<sup>65</sup> Nick Webster, "[Significant Steps Taken towards Dubai's Renewable Energy Targets](#)," *The National*, April 19, 2015.

In closing, the GCC states have new and strong incentives to invest in renewable energy:

- as a way to preserve natural gas and oil resources for export revenue,
- as a means to create jobs in new technology,
- and as a tool to attract foreign investment.

The fiscal reform efforts of GCC states will require some regulatory reform that may impact the ways that foreign investors and state entities interact, particularly in large infrastructure projects in the energy sector. Renewable energy can attract different kinds of foreign investors, including those interested in products like green bonds and sukuk.

The renewable energy sector is at the cusp of economic diversification efforts and the reconfiguration of Gulf political economies, as they come to rely more and more on external sources of finance and non-oil revenue. Renewable energy is literally and figuratively a way to move the economies of the Gulf states away from oil.

