

Q&A: Shams 1 Solar Power Project Financing Shines A Light On Renewable Energy In The Gulf

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The signing of the Shams 1 solar power project financing in the United Arab Emirates (UAE) earlier this month has opened the way for a burgeoning in renewable energy in the Gulf, in Standard & Poor's Ratings Services view.

Three companies, France's Total S.A., Spain's Abengoa S.A., and Abu Dhabi-based Masdar gained a US\$600 bank loan to build the plant, named Shams 1, which will have a 100-megawatt capacity and would qualify for carbon credits under the United Nation's Clean Development Mechanism (CDM).

We believe this marks the start of a potential new industry in renewables in the Gulf Cooperation Council (GCC) region, where renewables currently only represent less than 1% of the total energy mix.

In the following series of questions and answers, Standard & Poor's credit analyst Karim Nassif discusses why we think renewable energy will grow and takes a look at credit quality considerations.

Questions And Answers

What is Standard & Poor's opinion on prospects for future renewable energy projects in the Gulf?

Our view on the possible pipeline is positive. The recently closed Shams 1 deal establishes a precedent for renewable energy transactions and shows that such projects can be financed. However, the renewable energy sector remains in its early stages in the Gulf. According to the International Energy Agency, renewable energy projects represent only about 0.3% of the overall energy mix in GCC countries (GCC; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE; see table 1) to date.

Table 1

	Foreign currency	Local currency
Abu Dhabi (Emirate of)	AA/Stable/A-1+	AA/Stable/A-1+
Bahrain (Kingdom of)	BBB/Watch Neg/A-3	BBB/Watch Neg/A-3
Kuwait (State of)	AA-/Stable/A-1+	AA-/Stable/A-1+
Oman (Sultanate of)	A/Watch Neg/A-1	A/Watch Neg/A-1
Qatar (State of)	AA/Stable/A-1+	AA/Stable/A-1+
Emirate of Ras Al Khaimah¶	A/Stable/A-1	A/Stable/A-1
Saudi Arabia (Kingdom of)	AA-/Stable/A-1+	AA-/Stable/A-1+

*Ratings on March 29, 2011. ¶One of the United Arab Emirates. Source: Standard & Poor's.

Why are renewable energy projects likely to gain momentum in the Gulf?

We see various reasons behind a pick-up:

- Renewable energy enables diversification away from oil and gas. It also allows the full economic potential of oil and gas reserves to be realized either through exports or through use in generating value-added products for foreign markets. We understand that the GCC countries intend to preserve oil and gas reserves for export

purposes so as to safeguard their supply. Most countries in the GCC, with the notable exception of Qatar, are facing a gas supply-demand imbalance that, according to various estimates, could lead to a gas shortage of about 31 billion cubic meters (bcm) in 2015, compared to a shortage of about 19 bcm in 2009. What's more, conventional oil and gas fired power plants have proven costly as a result of fuel subsidies. These have ranged from around 2% and 12% of national GDP across GCC countries.

- We see a significant need to expand power production to meet domestic demand within the GCC and renewable energy represents a meaningful alternative to the traditional reliance on oil and gas. The region faces the twin challenges of building more power capacity for growing populations while supporting increased infrastructure development. We expect the GCC to invest about US\$100 billion over the next 10 years to increase power capacity. Meanwhile, we understand that the UAE, Qatar, and Saudi Arabia plan to spend some US\$170 billion on the transport sector alone in the coming 15 years. In addition, many countries are seeking to reduce their dependence on gas, including the UAE and Qatar, where most power plants are gas fuelled.
- Several GCC governments have announced renewable energy targets (often including nuclear power). For example, Abu Dhabi has announced that it aims for renewables to represent 7% of its energy production by 2020. Saudi Arabia, Kuwait, and Bahrain have also announced similar targets, both in terms of proportion and timeframe.
- Solar radiation levels in the Gulf are likely to support the operation of a rising number of solar projects (see table 2 below).
- We foresee a potential change in the energy mix worldwide following the troubles of Japan's Fukushima nuclear power plant after the March 11 earthquake and ensuing tsunami. It is currently too early to speculate on what the impact of the Fukushima nuclear incident will be for the renewable market globally. That said, any absence of nuclear power from the world's energy mix could lead to a greater dependence on conventional fuels for base-load demand (meaning the minimum amount of power that a utility or distribution company must make available to its customers, or the amount of power required to meet minimum demands based on reasonable expectations of customer requirements) and also on renewables. This may push GCC gas exports even higher, which could boost demand for renewable energy production within the GCC.

Table 2

Solar Energy Resources In GCC Countries		
Direct normal solar radiation		
	Direct normal radiation kWh/square meter	Direct normal solar irradiance kWh/square meter
Saudi Arabia (Kingdom of)	6.5	2,500
Qatar (State of)	5.6	2,000
Kuwait (State of)	6.5	2,100
Oman (Sultanate of)	6.2	2,200
Bahrain (Kingdom of)	6.5	2,050
United Arab Emirates	6.5	2,100

Source: American Institute of Physics: Journal of Renewable and Sustainable Energy, April 2009. A report on renewable energy research: A Critical Investment for the Arab Region, June 2007. GCC--Gulf Cooperation Council. kWh--kilowatt-hour.

What are the main challenges ahead for renewable energy projects in the GCC?

As with renewable projects everywhere, the absence of "supportive regulatory regimes" in the various GCC jurisdictions is a significant obstacle to determining the economics of projects. The Gulf region has not introduced a feed in tariff (FIT), investment tax credits (ITC), or renewable portfolio standards--all effective subsidies to facilitate

the development of renewable energy projects. Carbon production also carries a limited cost (see table 3 below). Lastly, subsidized fuel prices in the Gulf put renewable projects--be it wind or solar among others--at an economic disadvantage compared with fossil fuel driven plants.

The abundance of gas reserves in parts of the region, especially in Qatar, and the still-large oil reserves in the hydrocarbon exporting nations of the GCC, has led to slower development of renewable energy in the region than elsewhere. We think this could change, however, given that at least half of the GCC members have recently become gas importers.

Table 3

Rates Of Energy Consumption And Carbon Dioxide Emissions In Qatar And The EU-27		
Selected indicators	Qatar	EU-27
Average electricity consumption per capita (kWh)	17,573.0	6,388.0
Average carbon dioxide (CO2) emissions (million mt CO2 from fuel combustion)	48.5	3.9
Average CO2 emissions per capita (mt CO2)	58.0	7.9
CO2/GDP(kg CO2/\$)*	1.5	0.4

Sources: International Energy Agency (2007), World Bank. *At 2000 prices. mt--million tonnes. kWh--kilowatt-hour.

What does the Shams 1 transaction mean for future solar projects in the GCC?

The Shams 1 solar plant is the GCC's biggest renewable energy project to date and, in our view, could pave the way for similar projects in the future. The Shams 1 plant is being built under the independent water power and power producer (IWPP) model that Abu Dhabi already uses for conventional power and water desalination. We believe that other GCC countries may emulate Shams 1 if it proves to be an operational and financial success, particularly given the way that the IWPP model has spread across GCC countries in recent years. GCC countries' targets to generate 7%-15% of power through renewable energy within the next 10-20 years offer another incentive for expansion.

Shams 1 has attracted a 22-year, US\$600 million bank loan from eight foreign and two local banks led by French bank BNP Paribas. The Shams consortium also received a US\$153 million equity subscription from its sponsors: UAE-based Masdar holding a 60% stake, alongside France's Total and Spain's Abengoa each holding 20%.

Two different processes generate solar power: solar photovoltaic (PV) cells that absorb light and concentrating solar thermal (CST) technologies that harness heat.

The Shams 1 project uses parabolic trough technology, which is a form of CST technology to generate electricity. Specifically developed by Abengoa, the technology includes mirrors lining rows of sun-tracking parabolic troughs. The mirrors concentrate sunlight on a central boiler to generate high pressure steam. The steam then drives turbines to generate electricity.

Under the model, we understand the project company will sell power to state utility Abu Dhabi Water and Electricity Co. (ADWEC) under a power purchase agreement. An important feature of the Shams 1 solar project is the introduction of a "green payment" under which the Abu Dhabi Ministry of Finance will compensate ADWEC for the difference between average domestic power generation cost and the generation cost for Shams 1.

In our opinion, the IWPP model could be replicated relatively easily in renewable energy project financing. What's more, the addition of the green payment addresses an aspect that we consider critical: providing political support in the form of this payment, which enhances the long-term viability of renewable transactions.

What is Standard & Poor's methodology for rating renewable energy projects and how does the methodology factor in features specific to the Gulf region?

We apply our project finance methodology to assess the credit risks of renewable projects (see ("Updated Project Finance Summary Debt Rating Criteria," published Sept. 18, 2007). In accordance with our criteria, we evaluate general project-level risks, including contractual foundation, competitive market exposure, counterparty risk, and financial performance. We also assess project specific risks, namely resources, technology, engineering and Construction, and operations.

We have also published criteria specific to solar thermal and solar PV projects that elucidate the application of general project finance criteria to these projects (see "Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects" and "Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects," both published Oct. 27, 2009).

We don't expect resources for solar projects in the GCC to present a significant risk given the highly predictable weather patterns in the region. However, we would expect to consider closely in our credit analysis aspects such as the stability, transparency, and predictability of regulation. We would also monitor operational and maintenance costs, given the potential for challenges encountered with desert dust, for example.

In addition, as for most Gulf projects, we would look closely at the ability to enforce any security provided to investors, and how the contractual structure of a transaction addresses this issue.

What factors support investment-grade ratings on renewable projects in the Gulf?

When we evaluate any renewable energy project, we consider it critical to calculate estimated performance ratios for both solar and wind projects. Most solar PV projects that we consider as well designed and well built, for example, can in our view achieve performance ratios around 76% to 84% (see "Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects") in the first year of operation. We assess the level of reserving, or the cash cushion, in a transaction to see if it can withstand periods of significant stress—for instance when volumes of solar radiation or wind fall—and still maintain robust debt service coverage ratios (DSCRs). Standard & Poor's typically anticipates average DSCRs of between 1.4x and 1.5x minimum over the term of the debt (assuming fully amortizing debt) under its base-case scenario when rating a transaction. The DSCR could be lower, however, for well-structured PV projects using proven technology because the lack of moving parts in a solar PV project reduces operational risks. Also, PV projects have lower construction risks than any other type of power projects.

It is important to note that Standard & Poor's does not publish specific ratio guidance for investment-grade projects because a range of qualitative factors contribute to its analysis of these projects.

What renewable energy projects does Standard & Poor's rate?

We rate one solar thermal project, U.S. based Harper Lake Solar Funding Corp. We have also conducted credit assessments on a variety of European and U.S. solar projects. In addition, we rate a number of wind projects in Europe and the U.S., including FPL Energy American Wind LLC, Max Two Ltd., and Alte Liebe 1 Ltd.

Related Criteria And Research

All articles listed below are available on RatingsDirect on the Global Credit Portal, unless otherwise stated.

- Updated Project Finance Summary Debt Rating Criteria, Sept. 18, 2007
- Key Credit Factors: Methodology And Assumptions On Risks For Utility-Scale Solar Photovoltaic Projects, Oct. 27, 2009
- Key Credit Factors: Methodology And Assumptions On Risks For Concentrating Solar Thermal Power Projects, Oct. 27, 2009

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