

## **Renewables Spread to the MENA Region**

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Countries in the Middle East and North Africa - the so-called MENA region - are moving to diversify the power generation base by moving away from natural gas and oil.

Various countries in the region are actively investigating potential new projects involving coal-fired power plants, nuclear energy facilities and solar, wind and waste-to-energy projects.

### **Renewables, Really?**

The MENA countries, for the most part, have been slow to turn to renewable energy. Abundant and cheap oil have meant there has been little need. A lot of the push to renewables in the United States has been to lessen US dependence on the Middle East for oil. Not only is oil abundant, but local policies also make the price of oil and gas appear cheaper than its real cost. The region subsidises energy prices. It also does not put a price on carbon so that emissions from burning fossil fuels are not taken into account in weighing fuel options.

Various studies undertaken in the region have demonstrated that an overwhelming case can be made for renewable energy projects. For example, a renewable energy resource study commissioned by the Authority for Electricity Regulation in Oman found that the level of solar energy density in the Sultanate is among the highest in the world, particularly in northern parts of Oman and in the interior desert areas.

The same is true of other jurisdictions such as the United Arab Emirates and Saudi Arabia. Similarly, it is now widely acknowledged that the potential for large-scale wind farms exists in Morocco, Egypt and Saudi Arabia, among other countries.

Electricity demand in most states in the region is increasing at an average annual rate of 6 per cent. Not all countries are blessed with abundant hydrocarbons that can readily be deployed as fuels for power generation. This is particularly true in states such as Morocco, Egypt, Tunisia, Syria, Jordan and Yemen. There is a growing realisation that some of the demand in the region, particularly in rural or electrically-isolated areas, can be met by harnessing renewable energy.

Air pollution levels in MENA are among the highest in the world. Some governments are acutely aware of this and keen to implement measures to combat these levels by taking steps to try to improve air quality and, at the same time, reduce their carbon footprints.

Renewable energy could prove a major export for some countries. The Desertec initiative is a huge multi-lateral solar project planned for the Middle Eastern and North African desert regions that aims to ensure that by 2050, more than 50 per cent of Europe and the MENA region's electricity requirements are generated from renewable sources. (See [table 1](#) for further details.)

Another attraction to some MENA countries of using wind and sunlight to generate electricity is that it will free up more oil and gas for export. Finally, the potential for stimulating the local economies should not be ignored. New development means jobs. There is also the potential in the longer run of establishing industries around the renewable energy sector - for example in research and development, manufacturing and operation and maintenance.

## **Solar and Wind**

Solar and wind remain the two most promising form of renewable energy for the region.

The Masdar City initiative in Abu Dhabi is focusing on solar power in its drive establishment of a model sustainable city that minimizes carbon emissions. A pilot 10-megawatt solar photovoltaic project was brought on line in the summer 2009 and, while the financial downturn delayed the roll out of further renewable power development, a consortium of Spanish company Abengoa and French company Total was awarded the Shams 1 project in June 2010 that involves development of a 100-megawatt parabolic trough technology solar thermal plant. The project company for Shams 1 will be owned 60 per cent by the Abu Dhabi Water and Electricity Authority and 40 per cent by the private developers.

While Shams 1 will contribute greatly toward future development of renewable energy projects in the region, a US\$1 billion solar thermal project in Oman (See table 1 for more details) is likely to be 100 per cent private sponsor owned and developed and is more likely to be the true litmus test in the viability and financing of such projects in the region.

Wind is also expected to gain a significant foothold. Some countries in the region have areas with high average wind speeds. The main disadvantage of wind projects lies in their intermittency: the wind does not always blow when it is needed to generate electricity and can put strain on the electricity grid.

Intermittency risk can be mitigated by establishing wind farms over a large enough geographical area or by linking wind projects to hydroelectric power plants (for example, in a country like Egypt that offers both wind and hydroelectric potential) to deal with intermittency and to absorb any excess wind power by using the energy to pump water that can be run later through a hydroelectric dam.

Table 1 (attached or available online [http://www.ijonline.com/cmsv2/Images/Uploaded/291-10-33-27-197\\_crp\\_LG.jpeg](http://www.ijonline.com/cmsv2/Images/Uploaded/291-10-33-27-197_crp_LG.jpeg)) lists some of the projects that are being undertaken in the region.

## **Government Support Mechanisms**

Experience outside the MENA region shows that projects cannot be financed without the certainty of a long-term revenue stream that allows an acceptable rate of return. Governments in Europe and Canada have used feed-in tariffs to assure renewables developers high enough prices for their electricity to make the projects economic. Renewable portfolio standards at the state level and tax subsidies at the national level have performed the same function in the United States.

Thermal power projects in the region have benefited from direct offtake arrangements that require local utilities to contract on a long-term basis for power. These power purchase agreement models are now well established in Abu Dhabi, Bahrain, Oman and Saudi Arabia.

The model has also been used in certain other countries for the purposes of procuring renewable energy and has certain unique features.

First, the scope is limited to an individual project and the tariff and conditions match the requirements of that particular asset. Second, the counterparty is normally a strong creditworthy entity. Third, it is based around a "take or pay" arrangement to provide certainty of revenues. Equally, it provides the offtaker with the certainty of a fixed unit price for the energy. Fourth, the contract is of a long enough duration to allow long-term debt financing.

There are a number of disadvantages to this approach. Long-term fixed quota PPAs commit the offtaker to purchase power at a fixed price and amount irrespective of whether or not the price remains competitive or whether or not that power is actually required. In addition, the procurement of such projects can be costly and time consuming as each PPA is negotiated individually, although over time a precedent can be established that will be acceptable to the market.

There is a strong lobby for governments in the MENA region to implement feed-in tariffs. Abu Dhabi announced earlier this year that it is in the process of introducing such a tariff. The details have not been announced yet.

Jordan is considering a limited feed-in tariff that would only apply to excess power sold to the grid from "inside-the-fence" facilities that use renewable energy. A factory or other industrial plant would generate its own electricity but then be allowed to sell any spare output into the grid at the tariff price.

There are a number of advantages with this approach. First, it provides a socially-responsible framework in that it begins to make consumers more responsible for taking direct action for using renewable energy for their electricity. Second, it allows the government to test how a feed-in tariff works on perhaps a more manageable scale than extending it to all renewable energy purchases.

## Utility Economics

The price of electricity in the MENA region is already heavily subsidized. Clearly, conventional energy remains cheaper than energy procured from renewable energy sources.

The cost base of a government utility in the region is made up of a number of elements: capital cost, operation and maintenance costs, fuel costs (at market value) and costs associated with the "wires" businesses (namely the costs associated with transmission and distribution).

The price paid by end users for energy is fixed, in many cases by regional governments at cabinet level. This is artificially kept low. In order to ensure that utilities do not go out of business, they benefit from two subsidies - a direct subsidy that is provided to the utility by the government and an indirect subsidy that is inherent in the cost of fuel to the sector.

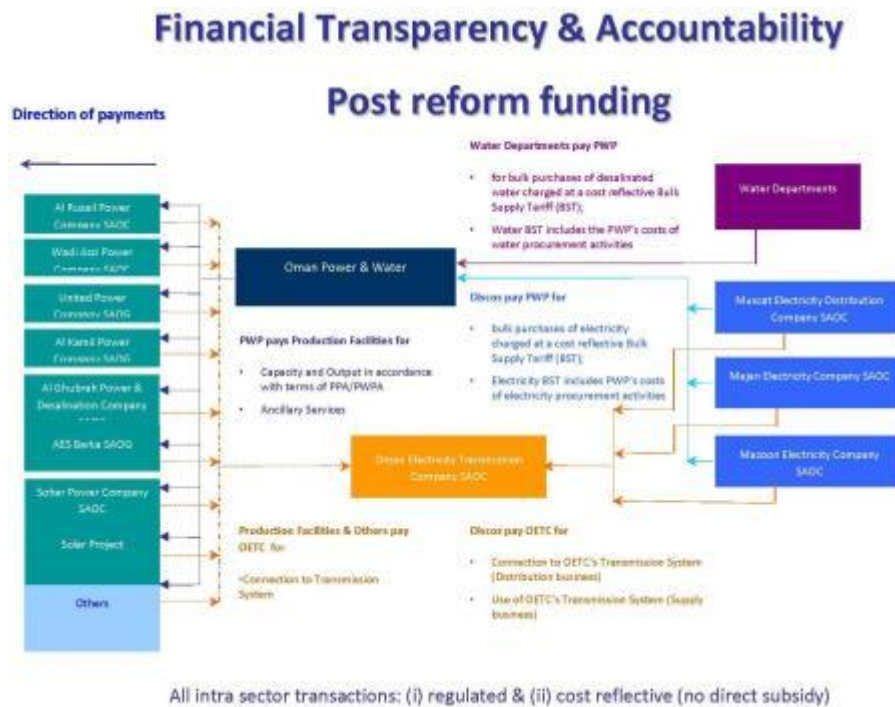
Chart 1 (next page) shows how the government subsidy operates in Oman. The Oman Power and Water Procurement Company or SAOC purchases power from generators at the true economic cost by entering into direct offtakes with independent generators. The electricity is sold to distribution companies at the "bulk supply tariff" that is the tariff that represents the purchase price plus a small up-lift or profit element. This cost includes the connection fee payable by the generator.

The power is then simultaneously bought and sold at the delivery point and wheeled by the distribution companies to their respective franchise areas. A connection fee is payable to the Oman Electricity Transmission System Company.

The price at which power is sold to end customers is fixed by the Council of Ministers. It is significantly lower than the true economic cost of buying and supplying the power to the end user. The difference between the sums recovered and the sums paid is the subject of a subsidy calculated by the Authority for Electricity Regulation in Oman and allocated by the Ministry of Finance in Oman for distribution between the various supply licensees in Oman.

A renewable energy project can fit within this mechanism without the need for legislative changes or the need to introduce specific regulations to ensure the viability of such a project.

Chart 1



Source: Authority for Electricity Regulation, Oman

In the backdrop of such an arrangement, it is arguable that there is no need for a feed-in tariff mechanism to drive the development of a renewable energy sector. The growth of the sector can be controlled by virtue of the number of power contracts entered into with each project being bid separately and any economic purchase obligations continuing to be satisfied.

### Challenges

Renewable energy projects still have a way to go before they can be successfully deployed on a large scale in the MENA region.

Such projects, even at small-scale pilot levels, are still scarce. Governments and other power sector offtakers still have to be educated about renewable technologies. Some headway is already being made with the appointment of technical, financial and legal advisers by various governments in the region.

Few parts of the MENA region have weather data (outside of metropolitan centres) of a level sufficient to provide sponsors and lenders with the comfort they need to finance projects. This is especially relevant in jurisdictions that apply the direct offtake model to renewable power procurement, as the power plant is then required under the power contract to be capable of producing at certain levels of output throughout the term of the contract. Rather than establish meteorological stations and wait for a sufficient level of insolation or wind data to build up, the offtakers can, for a defined initial period until the historical weather data has built up to an acceptable level, offer to share the risk in this respect. The sharing of risk for a limited period of time can be effectuated in a number of ways, including through the introduction of an appropriate mechanism in the tariff structure for the project.

Given the formative stage of renewable energy in the MENA region, most governments, even if they have a stated policy setting targets for renewable energy, have yet to implement a regulatory and legal framework that would support the stated renewable objective. There are a few exceptions to this, such as Jordan which is finalizing a renewable energy law that among other things, facilitates the acquisition of land for renewable energy projects.

The approach of some jurisdictions appears to be to run pilot renewable power projects (whether on a small or utility scale) to whatever extent the existing power sector law allows. The experience garnered from such pilot projects might then be used to make substantive changes to the sector law geared toward supporting the growth of future renewable energy projects.

Such an approach is not without merit, as these initial projects will allow countries to correct course not just from a legal and regulatory perspective but also in terms of implementing of the subsidies that the renewable energy industry still needs to compete with fossil fuels.

Given that several of the larger renewable energy projects in the region are only just taking off, the appetite for lenders to provide financing to such projects has not been established. Smaller projects may not need recourse to the debt market, but utility-scale projects will and will require credit support.

An encouraging fact is that the project finance market and practices in relation to large thermal power projects in the MENA region are fairly developed, with certain jurisdictions such as Abu Dhabi, Saudi Arabia and Oman having well-established precedents for financing and project documentation.

A renewable power project within the MENA region supported by an enabling government policy and regulatory framework, a well-defined and economically-viable tariff structure and project agreements based on previously-banked fossil fuel power project documents should be able to tap into the project finance lender market.

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