

Renewable energy deployment is increasingly reliant on independent power producers through power purchase agreements. Yet, off-takers are finding themselves committed to purchasing power at long-term and high prices in a dynamic market, while assuming all the risks. This is an impediment both for expanding renewables and achieving lower electricity prices. Future renewables growth will require a new approach to power purchase agreements as well as investment in mitigating risk and minimising generation costs.

The role of IPPs in powering energy transition

Governments across the Middle East are increasingly committing to low-carbon systems and renewable energy targets, with the aim of reducing the power sector's reliance on fossil fuels and relieving the pressure exerted on state budgets by generous fossil fuel subsidies, which have also increased energy consumption and greenhouse gas emissions. Although the share of renewables in the energy mix is low in all countries in the region, activity has been picking up in recent years: New and planned capacity, and related auctions and contracts are on the rise, and the Arab region saw \$11bn in renewables investment in 2016 compared to \$1.2bn in 2008.

With the capacity to finance the high capital cost of renewables projects, independent power producers (IPPs) have played a key role in the deployment of renewable energy across the Middle East without straining the budgets of national governments or utility firms. The most common agreement in place for IPPs – the power purchase agreement (PPA) – provides a long-term framework for producers to sell the electricity they generate to utilities companies.

Getting the details of a PPA right is a crucial factor in determining the bankability of a project and its attractiveness to investors. This is because it defines the financial terms and cost of electricity for the duration of the agreement – usually two decades or more – which has a long-term impact on both the seller and the purchaser.

Risk allocation and the dilemma of one-dimensional design

PPAs have so far enabled the implementation of utility-scale renewable energy systems even in countries outside the Gulf, where the risk posed to investors from conflict, struggling economies and weak business investment climates is high. However, the terms and simplistic design of PPAs, which mirror those used for thermal plants, are more favourable to the seller than the off-taker and present

a barrier to future renewables growth.

One significant issue lies with the allocation of risk. Rather than invest in de-risking measures and strengthening the investment policy framework, governments in the region have opted to tender renewable energy projects first and assume all the risk themselves. Therefore, while investors de-facto account for the level of political risk, the bulk of risk premiums built into PPAs is being shouldered by the purchaser. This includes operational risk related to the grid; the need for transmission upgrades to the point of delivery; counterparty risk; and regulatory risk associated with inconsistent policy.

Another problem is that the actual cost of PPAs in the region doesn't account for changing market prices, curtailments to energy and local currency fluctuations for contracts signed in USD.

With the increasing deployment of renewables, prices are falling sharply, impacting the off-takers that signed contracts years ago. The levelised cost of electricity generated from renewable energy that seemed competitive a few years ago is currently considered high and its value has dropped by more than double; The PPAs in place for a number of 200-MW solar projects in Jordan, for example, have at a fixed tariff of \$0.169 per KWh, while the country's 52.5-MW Ma'an solar project has a tariff of \$0.148 per KWh. All the projects were initially hailed as low cost, since the generation cost from thermal plants is almost \$0.24 per KWh. Yet, the latest tariffs have averaged \$0.06-0.08 per KWh, making the earlier contracts an impediment to achieving lower consumer energy prices.

The issue is worse in Lebanon as the government has signed wind PPAs of more than \$0.945 per KWh at times when the regional average had dropped to \$0.6. In order to secure renewable energy capacity at cheaper prices, some off-takers in markets around the world have considered terminating old, expensive PPAs. However, such a move would be counter-intuitive in many Middle Eastern countries, as it would further undermine an already weak investment climate, increasing the risk premium in future projects.

Across the region, major investments in energy storage and grid enhancements are required to account for the increasing amount of intermittent renewable energy on the grid. But such investments have been lagging behind, which could potentially result in the curtailment of renewable energy. However, most PPAs require the off-taker to purchase all the generated power at a fixed cost, including the deemed or virtual energy which should have been delivered during curtailment, and

only include an annual estimation of the produced power. Deemed energy should be calculated based on monitored data and stakeholders should agree on a separate cost.

Fresh approach to PPAs needed for future renewables growth

The future expansion of renewables capacity across the Middle East, not only in countries such as Palestine and Iraq, where renewables development is nascent, but also Jordan, the Lebanon and the Gulf, where the sector is more established, will depend heavily on whether policymakers can adopt a multi-dimensional approach to structuring PPAs.

In addition to providing certainty for investors that the electricity generated will be purchased over a significant period of time, especially in high-risk markets, energy strategies should prioritise the optimisation of generation costs, as this would enable a faster elimination of subsidies. Governments should also invest in de-risking renewable energy development and ensure that billable risks are aggregated and shared between the seller and off-taker, and a potential third-party insurer. Mitigating risk will also require a restructuring of the electricity utilities and the power markets to allow for a gradual drift away from the single-buyer model.

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