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King Abdullah Petroleum Studies and Research Center

Is the Time Ripe for Private Investment in Interconnections in the MENA Region?

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Introduction

Efforts to integrate power systems and markets in the Gulf Cooperation Council (GCC) countries and the wider Middle East and North Africa (MENA) region are gaining momentum. With rapidly growing regional electricity demand, the development of an integrated electricity market has the potential to offer a multitude of benefits to participating countries. This will require sufficient interconnection capacity to efficiently utilize surplus power while taking advantage of price and demand diversity in participating countries. Developing cross-border interconnections entails significant investment, and financing this investment has often been challenging. The Gulf Cooperation Council Interconnection Authority (GCCIA), formed in 2001 to link the power systems of the GCC countries, has successfully built interconnections with ~3,850 megawatts (MW) of aggregate capacity (Figure 1). However, the existing capacity is highly underutilized for various reasons.

Previously, any discussion on electricity market integration has largely centered around developments within GCC countries. However, policymakers are increasingly showing their interest in expanding the size of the interconnected electricity market, even beyond the GCC. This growing recognition culminated in the signing of a memorandum of understanding (MoU) in 2017 under the ambit of the Arab League to establish a joint pan-Arab market for electricity. While the Saudi Arabia-Egypt 3,000 MW interconnection is at the tendering stage, feasibility studies are underway for a Jordan-Saudi Arabia transmission line, and the option of connecting the power systems of other countries, including Iraq, are also being explored. Investment-related challenges are going to arise again when building new interconnections.

On June 26, ACWA Power announced a new venture between itself, the National Grid Saudi Arabia, and China Electric Power Equipment and Technology Company Limited (CET), to evaluate the prospects of investing in new private interconnections and grid projects (ACWA Power 2019). This is a welcome development. Against this backdrop, it is worth examining the potential business models used to encourage investment in cross-border interconnections and their suitability for the MENA region.

Cross-border interconnections – the status quo

In 2014, the European Council (EC) set a target for the interconnection capacity between member states to be at least 10% of each country's installed electricity production capacity by 2020, rising to 15% by 2030. The EC acknowledges that its interconnection targets are ambitious but contends that, to achieve its climate and energy goals, there needs to be better interconnectivity between European Union (EU) countries. No such prescribed limits for GCC countries exist. However, the GCC's ~3,850 MW of interconnection capacity represents 4% of Saudi Arabia's installed electricity production capacity, between 5% and 7% of the UAE's, Oman's, Kuwait's, and Qatar's and 15% of Bahrain's. This is undoubtedly a significant achievement.

Financing interconnectors – regulated or market-based?

Despite some drawbacks, regulated transmission investment remains the traditional business model in many countries and regions, including Europe, for encouraging investment in cross-border transmission capacity. In this model, investments are made by the owners of transmission companies in the connecting

countries. These investments are included in the companies' regulatory asset bases and are underwritten by the contribution made by consumers to regulated network tariffs. These tariffs are determined by the respective regulatory authorities.

The so-called 'rate of return regulation' is often criticized for being inefficient, as it motivates utilities to make unnecessary investments in order to inflate the rate base (on which returns are calculated)and increase their profitability. International experience suggests that the regulated investment approach has not been entirely successful in soliciting investments in cross-border interconnections for several reasons. First and foremost, a regulated investment approach that obliges transmission owners to invest in cross-border interconnection capacity offers them limited incentives, especially with weak unbundling. The appetite of transmission owners to invest in interconnections is also weak, as this could lead to increased competitive pressure on their own generation facilities. Second, accessing capital in the face of regulatory uncertainties, such as the lack of a stable long-term regulated tariff and the likelihood of changes to the business agreement, becomes more challenging. Third, sharing the costs and revenues between transmission owners in an interconnected system is sometimes controversial. Lastly, transmission owners may either fail to see the long-term economic benefits of interconnections or ignore them due to other near-term priorities.

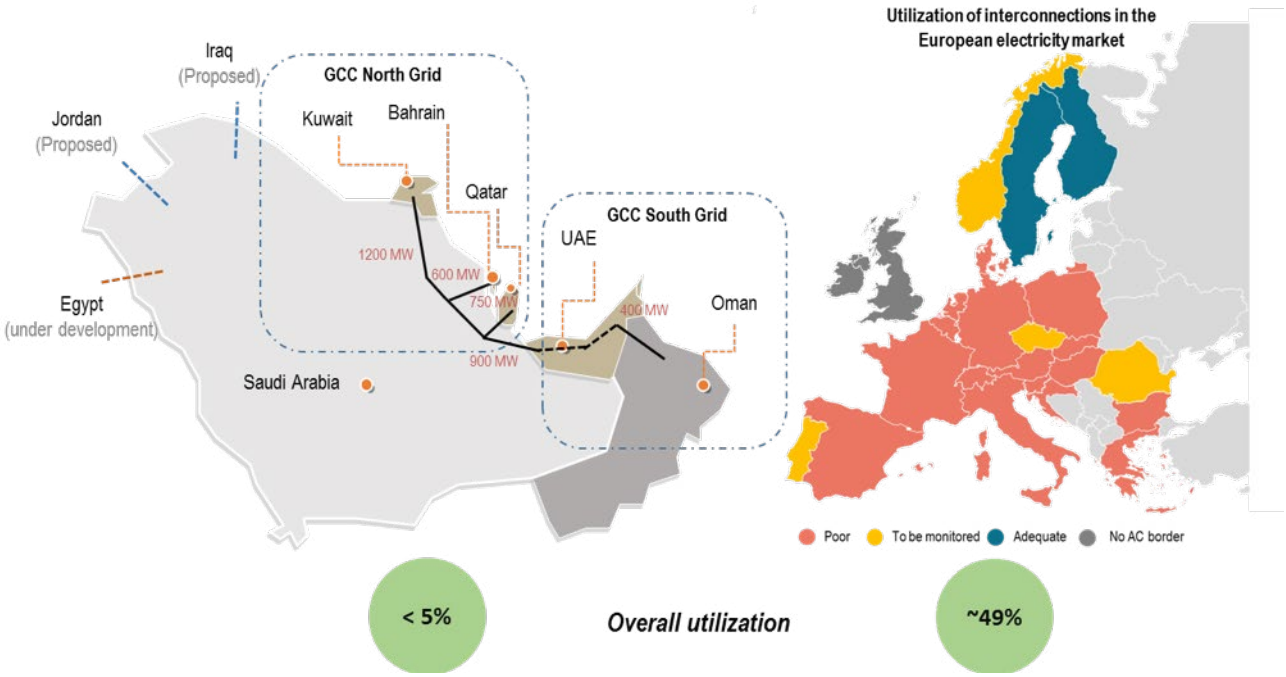
Alternative market-based approaches such as concession-based and merchant-based investment frameworks have been experimented with in places where transmission owners were unwilling to make investments. However, the number of merchant-based projects developed so far has remained low. Private developers, especially of merchant-based projects, are allowed to recover their costs through the combination of congestion rent and the auctioning of financial (or physical) transmission rights, among other potential sources of revenue. However, the price and demand-related market risks remain with the developers. Merchant transmission lines collect revenues for relieving network congestion. These revenues depend on the exchange of power from lower cost to higher cost locations.

However, none of these investment models are perfect substitutes to each other or have inherent absolute advantages. EU Directive 2009/72/EC strongly favors regulated interconnection, along with some type of regulated third-party access, as opposed to the merchant model. Regulated investment for interconnections is taken as the default approach, while merchant investment is encouraged as an exception in situations where investments through regulated cross-border interconnectors might not materialize.

Interconnectors in the Gulf region – overcoming challenges

As the electricity sector in the Gulf region is not operated on a sound economic basis, it does not incentivize owners of transmission companies to invest in cross-border interconnections. The interconnection capacity of the GCC countries has been developed and is owned by the GCCIA, and is funded by GCC member states. This investment model has undoubtedly relieved the region's vertically integrated utilities (or transmission owners) from committing their own resources and recovering them through regulated charges. Under the existing arrangement, the use of interconnectors for emergency services is allowed free of charge. But national utilities have the right to pay 'additional interconnector usage charges' to use the interconnectors for other economic purposes (e.g., sharing installed capacity, operating reserves, and trading energy through scheduled energy transfers). Conversely, recovering entire investments would be a formidable challenge to the investing entity (transmission owners or GCCIA). This is clearly evident from

Figure 1. GCC interconnections, line capacities and utilization.



Source: Compiled by KAPSARC. Data on the European market is from ACER (2018). The map showing regional interconnections (existing and under development) is for representational purposes and does not show the exact transmission corridor between the countries.

the poor utilization rate of the GCCIA interconnection capacity of less than 5%, compared with about 49% in Europe (Figure 1). This low utilization rate is due to the fact that interconnections were originally planned to share reserve capacity and provide stability and support to the grid during emergencies rather than to maximize economic gains through cross-border electricity trade. Achieving 'self-sufficiency' was narrowly interpreted as a way to ensure 'energy security.' The sound financial strength of GCC member countries has allowed them to plan and add sufficient generation capacity. Furthermore, the current market design and pre-existing policies also discourage market players from actively engaging in cross-border electricity trade. To reap the benefits of market integration, the functioning of the electricity markets needs to be improved. The effective utilization of existing interconnection capacity should be improved by addressing price and non-price barriers to cross-border electricity trade.

Low electricity tariffs in most GCC countries are unable to recover their full costs, and a regulated investment approach may be insufficient to incentivize transmission owners to invest in developing new cross-border transmission lines. The international experience of merchant transmission lines also suggests that a market-based approach may not encourage transmission companies to invest in the Gulf region, due to unclear price formations. This unclear pricing comes from a lack of transparency of wholesale electricity prices between countries and subsidies in the electricity value chain. This unclear pricing implicitly limits the business potential for cross-border interconnections. Therefore, a tailored approach needs to be devised for public-private investments in new cross-border transmission interconnections. Identifying and ensuring long-term business potential is likely to generate more investment interest, but the goal of promoting socially optimal and efficient investments should not be overlooked.

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