

Overcoming Challenges to Developing a Well-Functioning Electricity Market in GCC and MENA

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This publication is also available in Arabic.

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Key Points

Developing a well-functioning, integrated regional electricity market is an evolutionary process, and requires cooperation among governments and other stakeholders in the Gulf Cooperation Council (GCC) countries and wider Middle East-North Africa (MENA) region. KAPSARC conducted a workshop on October 22, 2019 to address this subject, yielding the following insights:

Countries in the region increasingly want to diversify and decarbonize their electricity markets by shifting to renewable and nuclear energy. This creates impetus for them to establish a fully integrated regional electricity market. Besides offering other economic opportunities, a fully integrated multi-country power system with access to a portfolio of energy supplies is also likely to mitigate the variability and intermittency of renewable energy production.

Removing the supply-side price distortions is an ideal requirement but not a prerequisite for a regional electricity market. Worldwide, power pools have been developed in wholesale markets characterized by various forms of subsidies. Concerns about “implicit wealth transfers” could be addressed with shadow fuel prices and/or volume- and time-specific marginal costs for trading surplus electricity.

A fully liberalized market structure at the national level is not a precondition for market integration. However, national reforms will be an important enabler for cross-border trading. Countries can maintain different market structures/designs. However, participating countries should harmonize their approaches to wholesale electricity market development as much as possible.

In the future, pool-based trading arrangements should replace the current bilateral mechanisms to create transparent market prices that enhance price discovery and facilitate trading. The use of spot markets (for various timeframes) will help facilitate market integration and reduce the need for government intervention at national level.

Open access should be gradually allowed at country and regional levels. Power producers may be allowed to participate in electricity markets directly when fuel prices for electricity production are market-based with no implicit/explicit subsidies.

The objectives of regional electricity market integration need to be developed and agreed upon by the participating countries. Clear articulation of these goals will help the relevant authorities design appropriate market rules and identify areas that will require harmonization at the planning and operational stages.

The experiences of the European Union and United States underscore the need for regional institutions to support electricity market integration objectives. The presence of similar regional authorities in the GCC and MENA region will greatly facilitate market integration efforts.

Summary

This Workshop Brief reports on the insights derived from roundtable deliberations that focused on how to establish a well-functioning cross-border electricity market in the Gulf Cooperation Council (GCC) and Middle East-North Africa (MENA) region.

In the past, countries have mostly achieved self-sufficiency in electricity through fossil fuel-based (gas and liquid) resources. However, several countries in the GCC and MENA region have taken important steps to diversify their energy supplies to improve economic growth, energy access and reliability, and environmental sustainability. These initiatives focus on decarbonizing the economy, particularly power generation, through increased use of renewable and nuclear energy. Beyond reducing economic dependence on fossil fuels, the energy transition creates impetus to enhance regional cooperation.

An interconnected regional electricity market can support the ongoing energy transition by decreasing the variability and intermittency of renewable energy production and the stochasticity of emerging loads. It can also bring economic gains through cross-border electricity trading and lessen the curtailment of renewable energy production as planned by some governments.

Achieving such an energy transition will require participating countries to clearly articulate their objectives for market integration, ranging from efficient price formation, enhancing energy access and security, and fulfilling climate change agreements to arbitrage and portfolio optimization. This will be critical to the success of the integrated market, specifically for designing appropriate market rules and identifying areas that require harmonization to facilitate future developments.

Outside of Abu Dhabi and Oman, GCC countries have seen limited electricity market reform since the 1990s. Regional integration carries no prerequisite for national markets to be fully liberalized and countries can maintain different regulatory regimes. However, a certain degree of harmonization in market rules, planning and operations will be necessary, especially in the areas of system security, grid planning and operation, network access conditions (including interconnections), and key economic regulations, such as capacity allocation and interconnection pricing. In this context, at a minimum, participating countries can harmonize their approaches to developing the wholesale electricity market as much as possible. Standardization will also help prevent conflicts arising out of any dissimilarities between countries at a later stage.

Market integration does not necessitate the removal of supply-side price distortions. Subsidies in the energy value chain, while undesirable from a market standpoint, commonly exist, based on case studies of several international jurisdictions. Therefore, the conclusion that subsidies significantly impede the development of an integrated regional electricity market appears faulty.

At the same time, the elimination or reduction of subsidies will encourage cross-border trade. This could be achieved through new fuel price setting mechanisms (which either eliminate the subsidy contribution to fuel prices or reduce them by aligning the low domestic fuel prices with another market-based benchmark). Alternatively, implementing volume- and time-specific marginal costs for electricity production may incentivize cross-border electricity trading.

Regarding carriage pricing (the cost of using cross-border interconnectors), the current non-market-based approach does not offer the right price signals to incentivize investment in appropriate future interconnection capacity expansion. Further, to enable trade among participating member states and increase the involvement of independent power producers in cross-border trade, open access must be gradually allowed, not only at the country level but also for cross-border interconnectors. Ideally this should be mandated through legislation and regulations that provide fair rules for access, including the pricing of grid services. Currently, open access regulations are absent or loosely defined in GCC and MENA countries.

Low or subsidized domestic fuel prices are seen as major barriers to cross-border electricity trading but have less relevance in the current single buyers (SB)-SB and transmission system operators (TSO)-TSO trading arrangement. Electricity producers may be allowed to directly participate in the market when fuel prices are market based, with no implicit or explicit subsidies. Moving forward, trading arrangements could introduce day-ahead and intra-day spot markets. The SB model should serve as an interim step in the transition to a more competitive wholesale market.

Reluctance to cede national sovereignty poses the biggest challenge for the centralized allocation of interconnection capacity. A single-window platform for allocation and congestion management represents the best and most efficient way forward for the establishment of a regional market that can benefit consumers.

Considerable debate continues over the suitability of energy-only versus capacity markets in providing adequate incentives for investments in generation and transmission in the design of a wholesale electricity market. Due to increasing downward pressure on prices caused by low or zero marginal cost renewables, capacity markets will likely become more prevalent. The growing requirement for enhanced grid flexibility and resiliency would also require appropriate changes in market design and market structure.

The experience of the European Union and the United States underscores the importance of regional institutions in providing valuable support to market integration and cross-border trade. However, while regional institutions can play a major role, local market policies have the greatest potential to drive market integration.

Background to the Workshop

Numerous electricity systems and markets around the world have integrated to form power pools to achieve operational, planning and environmental objectives. However, beyond the physical interlinking of national grids in the Gulf Cooperation Council (GCC) countries, the concept of regional markets has gained little traction with political and commercial institutions in the GCC countries and wider Middle East-North Africa (MENA) region. As a result, the volume of cross-border electricity trade remains low. However, as electricity consumption grows in the GCC countries and MENA region, developments on the supply side, including more cost-effective renewable power generation and nuclear energy deployment, coupled with tightening fiscal constraints, create greater impetus for an integrated regional electricity market.

The successful integration of multiple national markets faces significant operational, commercial and political challenges and will require strong support from participating governments and other stakeholders. To this end, KAPSARC held the workshop “Overcoming Challenges to Developing a Well-Functioning Electricity Market in GCC and MENA,” on October 22, 2019, with three primary objectives:

To improve the understanding of key factors that could affect the creation of a viable integrated electricity market in GCC countries and the MENA region (including policy, legislative, regulatory, pricing, institutional and operational issues).

To examine integrated regional electricity markets in other parts of the world and identify best practices for potential application in the GCC countries and MENA region.

To offer lessons to policymakers and other stakeholders involved in GCC and MENA electricity markets.

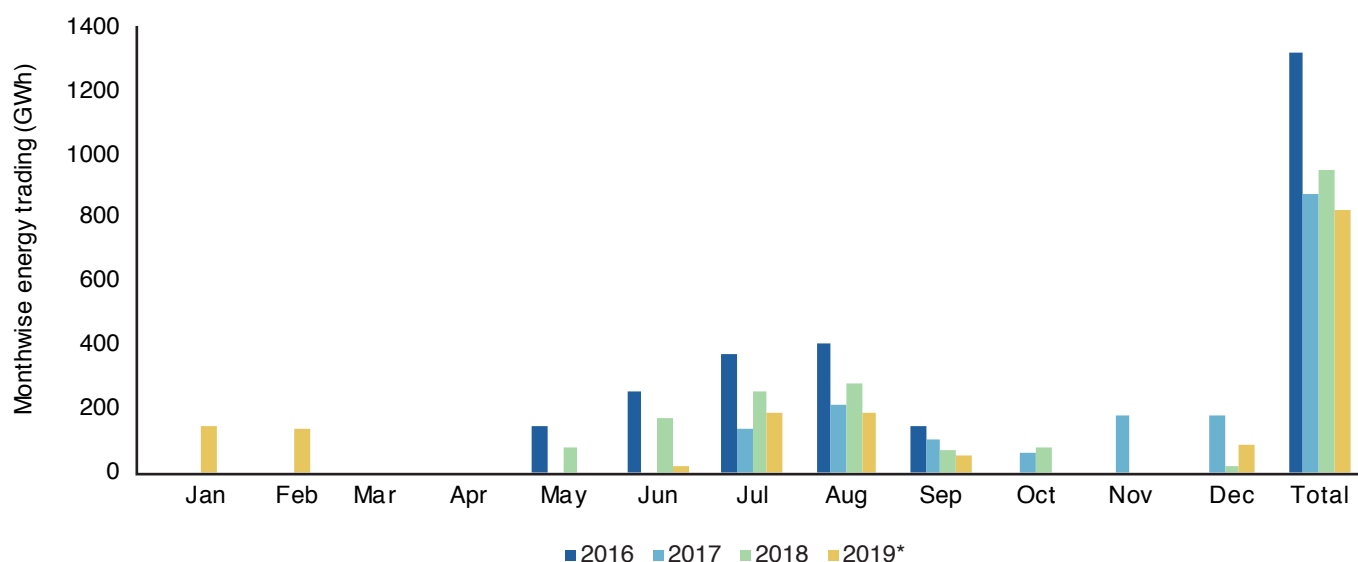
This workshop summary includes a brief update on the current state of electricity market reforms and electricity trading in GCC countries and the MENA region. It is followed by an analysis of the issues and recommendations for overcoming policy, regulatory, institutional and commercial obstacles specific to the region, and potential enablers for accelerating market integration across national boundaries. KAPSARC’s research in this area aims to develop policymaking insights that can complement the ongoing efforts toward regional electricity market integration.

Energy Transitions: A Driving Force for Regional Cooperation

A number of resource-rich countries in the region have historically focused on expanding domestic electric power generation as the best way of ensuring energy security. Conversely, they have shown little interest in integrating their electricity markets with those of neighboring states, despite potential cost and efficiency advantages. When the GCC countries formed the Gulf Cooperation Council Interconnection Authority (GCCIA) in 2001 to link their power systems, they planned only to share reserve capacity and provide emergency grid support rather than maximize economic gains through cross-border trading. This approach continues to shape electricity market cooperation between GCC countries, reflected by low volumes of cross-border electricity trading, of which bilateral in-kind arrangements comprise a significant share (Figure 1).

Presently, gas and liquid fuels dominate electricity production. However, for both environmental and economic reasons, governments in the region increasingly seek to diversify the supply side and decarbonize power generation by shifting to renewable and nuclear energy. To help achieve this aim, in recent years several countries have devised national economic development plans and energy policies that call for more sustainable and efficient energy sectors. These schemes share four common goals: enhancing competition, improving energy supply security, adopting sustainable development strategies, and diversifying energy resources (Figure 2). They focus on the transition from an overreliance on oil and natural gas toward a more balanced portfolio in which clean energy sources comprise a large share. Consequently, these countries have set high targets for renewable energy (Table 1).

Figure 1. Power trading through the GCCIA Interconnector.



Note: GWh = gigawatthours.

Sources: Presentation Electricity Market Transition and the Regional Trade in the Gulf Region; KAPSARC Workshop, Overcoming Challenges to Developing a Well-functioning Electricity Market in GCC and MENA.

* January to September.

Energy Transitions: A Driving Force for Regional Cooperation

Figure 2. Converging policy goals.

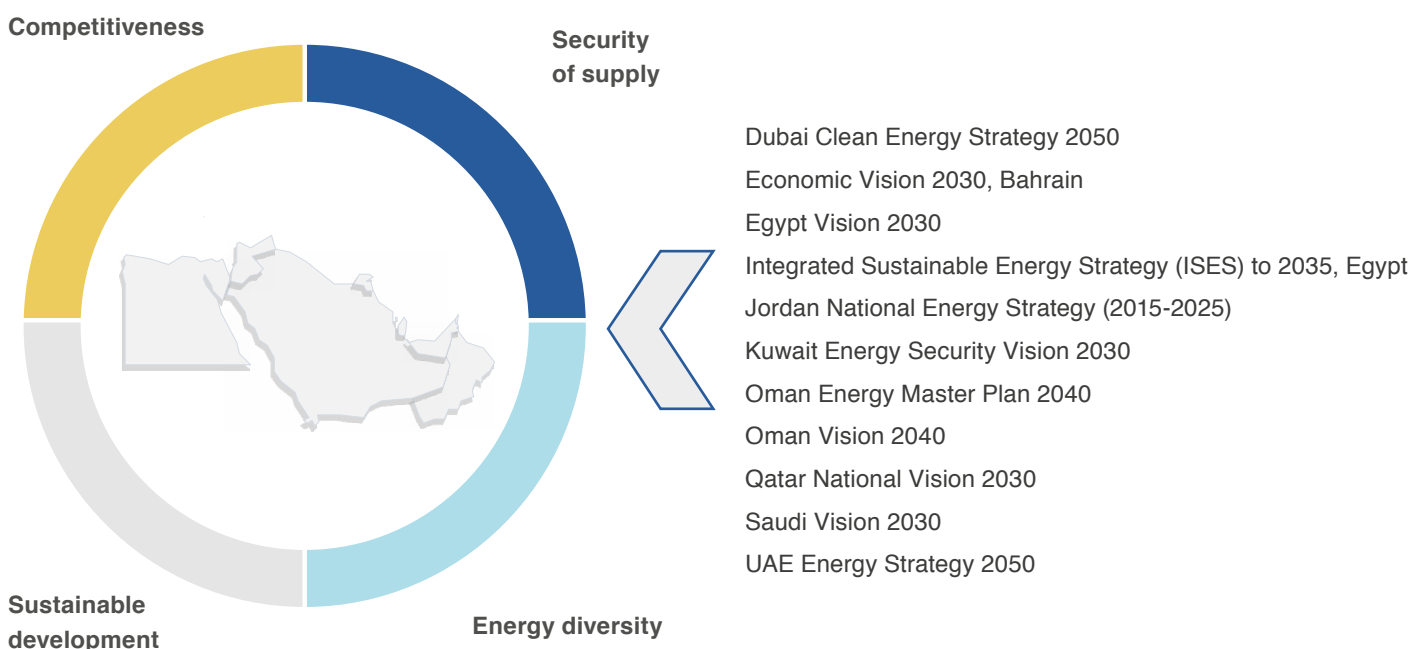


Table 1. GCC, Egypt and Jordan renewable energy targets.

UAE Abu Dhabi Dubai Ras Al Khaimah	27% clean energy by 2021 and 44% of capacity by 2050 7% of capacity by 2020 7% of electricity generation by 2020, and 25% by 2030 25%-30% clean energy by 2040
Kuwait	15% of electricity generation by 2030
Bahrain	5% of electricity generation by 2025 and 10% by 2035
Qatar	200-500 MW of solar by 2020
Oman	10% of electricity generation by 2025
Egypt	20% of electricity generation by 2022 and 42% by 2035
Jordan	10% of primary energy demand by 2020

Sources: Renewable Energy Market Analysis: GCC 2019; International Renewable Energy Agency; Egypt 2035 Integrated Sustainable Energy Strategy; updated 2007 Jordan Master Energy Plan.

Although successful realization of the renewable energy targets will depend on various domestic factors, including the design and implementation of supporting regulatory frameworks, experts believe that increased diversity of energy sources (wind, solar, nuclear and coal [if it goes forward in the case of Dubai]) will spur substantial cross-border electricity trading. Workshop participants also noted that differences in gas availability and demand (due to disparate peak demand timing and seasonality),

the type of fuel used and the different level of operational efficiency of the different energy system, etc., will also encourage clean energy adoption and/or electricity market integration. Further, Oman and the United Arab Emirates (UAE) are in a different time zone than the other four GCC member states, creating some degree of demand diversity. Also, the demand patterns of Egypt and Jordan differ from those of the other GCC countries, causing increased motivation for cross-border electricity trading.

Pricing and Subsidies: Relevance For Regional Market Integration

Energy subsidies represent a central element of the regional political economy and form an integral part of energy price formation, in varying degrees, in the Gulf region. In the electricity sector, subsidies can assume different forms and modalities, with direct or indirect effects on production costs and/or final consumer prices. Low domestic fuel prices and/or other forms of implicit or explicit subsidies to electricity producers have long been cited as critical obstacles to cross-border electricity trading between Gulf countries. Governments maintain these policies primarily to keep electricity prices low for end users, thereby benefiting their citizens. State-owned companies that supply fuel to state utilities and independent power producers have often objected that a state-mandated single/principal buyer selling electricity outside national boundaries can result in implicit wealth transfer.

However, international experiences related to electricity trading in various jurisdictions show that subsidies in the value chain do not inherently impede the development of cross-border electricity trading. Though undesirable from a market viewpoint, most systems exhibit such subsidies to varying degrees. For example, PJM Interconnection, a regional transmission organization in the United States (U.S.) that runs the largest electricity market in the world, argued that “several state policies still provide some form of subsidies, and such practices conflict with and corrupt the market it has set up to create competition” (Jacobs 2019). It petitioned the Federal Energy Regulatory Commission to change price bid mechanisms in its market for power plants that receive subsidy payments. However, the existence of state support to power producers, especially for renewable and nuclear energy, did not stop PJM’s annual billing across 13 states and the

District of Columbia from totaling 49.79 billion U.S. dollars (US\$) in 2018.

In Europe, according to a recent study, direct subsidies for coal-based generation exceeded 1.2 billion euros (EUR) during 2015-2017 in the Western Balkans (Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro and Serbia) and other countries (Georgia, Moldova and Ukraine) that form the Energy Community Contracting Parties (ECCPs) (Miljevic, Mumovic and Kopac 2019). Including certain indirect subsidies, this figure reaches EUR 2.4 billion. Thus, while subsidies could interfere with market evolution and price discovery, they did not prevent market integration among the numerous ECCP countries. Market integration is being facilitated through coupling the day-ahead markets of ECCP countries and European Union (EU) member states. ECCPs are expected gradually to eliminate direct subsidies through future national market reforms.

Discussions held during the workshop produced the following observations and suggestions related to pricing issues:

Fuel pricing adjustment: Low or subsidized domestic fuel prices are an important issue for cross-border electricity trading but less so for SB to SB or TSO to TSO trading arrangements. To prevent implicit wealth transfers when trading electricity with other countries, an SB can correct for fuel subsidies by using a shadow fuel price or aligning low domestic fuel prices with a market benchmark. Electricity producers may be allowed to participate in a market directly when fuel prices paid by them are market-based with no implicit or explicit subsidies. Alternatively, realistic assessments of volume and time-specific marginal costs for each

hour of economic dispatch could enable the SB to offer bids for trading surplus electricity. This approach emphasizes the value of market price formation relevant to various time periods.

Carriage pricing adjustment: The utilization rate of the cross-border transmission interconnection capacity developed by the GCCIA has been less than 5%, compared with about 86% in the day-ahead market in Europe in 2017 (ACER 2018). In order to incentivize power trading, the GCCIA waived carriage charges for using its interconnectors during 2016-2018. It reinstated a nominal charge in 2019 of US\$0.5 per megawatthour (MWh), a 90% discount off the previous rate of US\$5/MWh established in 2010. This creates a situation where those using the GCCIA interconnectors or deriving benefits from cross-border trading have been indirectly cross-subsidized by the other GCC nations as GCCIA shareholders. Given the significant unused capacity collectively owned by the GCC member states, this non-market-based pricing approach can enable trade in the current scenario but will not provide the right price signals (or other incentives) to create additional capacity in future. A fair and transparent system for pricing the utilization of interconnectors needs to be devised and implemented. A two-part pricing structure comprising both fixed and variable components should be adopted to prepare the member states for liberalized third-party sales and open access in national markets. A target should be set of at least 10% of each country's installed electricity capacity for the interconnection capacity between member states; this principle was followed by the European Council in 2014 to encourage market integration.

Presently, no such prescribed limit exists for GCC countries. However, the GCC's interconnection capacity of about 3,850 megawatts (MW) represents 4% of Saudi Arabia's installed electricity production capacity, between 5%-7% of the UAE's, Oman's, Kuwait's, and Qatar's, and 15% of Bahrain's.

Low or negligible marginal cost renewables:

Most of the countries in the Gulf region have ambitious plans to decarbonize their electricity production in the near future. In the next 10 years, the region will likely witness substantial growth in renewable energy production, especially for solar and wind. Because renewable energy generally has low or negligible marginal cost per unit produced, it does not carry the same wealth transfer issues as fossil fuel-based power and thus may not incite similar resistance to cross-border electricity trading. Renewables can therefore encourage regional electricity market integration and increase cross-border electricity trading. At the same time, an integrated regional market can boost renewable energy adoption by mitigating the variability and intermittency of national renewable power generation as well as the stochasticity of emerging loads, thereby reducing the need to curtail renewable energy production to balance the energy system. However, what will happen if all major countries in the region add sizable amounts of renewable energy in future? Will there be a market for such intermittent energy within the region or will the producing countries have to find other solutions, such as exporting the surplus to other regions? The potential implications of high levels of intermittent renewable energy in the nascent regional market need to be studied from a market design perspective.

Electricity Market Design and Regional Integration

It is often argued that an integrated electricity market with substantial cross-border trading requires the liberalization of participating national electricity markets. However, international experience suggests that a regional electricity market can evolve between participating electricity jurisdictions even without a compatible market structure. One example can be found in the U.S., where in the late 1990s, California fully deregulated its electricity market, even though the less mature markets in neighboring states remained largely characterized by bilateral day-ahead and real-time markets. The Southern African Power Pool (SAPP) offers another example. The countries in the southern region of Africa formed this integrated electricity market in 1995 to ensure reliable and economical electricity supply to consumers, in pursuit of a vision to rationally utilize natural resources and minimize negative impact on the environment in an area where the electricity industry was largely characterized by limited deregulation and/or vertically integrated utility structures (Bredesen 2016).

Turning to northern Europe, Norway started exporting electricity to Sweden after developing capacity that far exceeded its own power consumption. This oversupply led to market reforms and ownership unbundling to create a more competitive market, which resulted in the 1993 creation of Nord Pool, a bilateral Norway-Sweden electricity market. Finland and Denmark subsequently joined, and Nord Pool eventually became a core component of the EU Electricity Market Directive to facilitate the creation of a pan-European electricity market. Today, northern and central EU countries have mature, competitive and integrated electricity markets, and southeastern European countries are working to integrate with the wider EU electricity market. The examples above demonstrate that different levels of market liberalization, and the lack of a harmonized legal

and regulatory framework, should not be obstacles for developing a regional electricity market with substantial cross-border trading.

The workshop generated the following observations and suggestions related to prerequisites for market integration:

Reform progress: GCC and MENA countries are at different stages of market reforms with varying levels of commitments, and overall limited market liberalization has occurred. Oman and Abu Dhabi have moved ahead of other GCC and MENA territories.

Market reform as a precondition for regional market: Fully liberalized national market structures are desirable but not required for market integration (see specific examples above). While countries may have different market rules, substantial cross-border trading necessitates a certain level of harmonization of planning and operations. As much as possible, participating countries should standardize their approaches to wholesale electricity market development. This could help prevent conflict at a later stage.

Market design for cross-border trade: In the near term, the bilateral SB to SB model of trading, based on the Power Exchange and Trading Agreement arrangement of the GCC Electricity Market System, a simple electricity trading system designed by the GCCIA in 2018, will likely persist in the GCC and MENA. However, this should evolve toward a regional pool-based mechanism. A hybrid model containing both bilateral contracts and a power exchange pool can provide greater flexibility as we move closer to the dispatch points. Achieving sufficient trading volume in the pool-based market will support transparent and robust market prices,

which are very important for the health of the bilateral market. In other words, these two markets (a combination of bilateral and power exchange) are inter-related and the success of one depends on the other. Some emerging markets establish a threshold to ensure a minimum volume of electricity clears the pool-based market.

Access to the market: Allowing power producers to directly participate in cross-border electricity trading will accelerate regional market integration. Open access (OA) to the grid and third-party sales can improve market liquidity in cross-border exchanges, which is currently constrained by the SB model. These measures should be promoted by legislation with sufficient political commitment, and regulatory frameworks that provide fair rules for access, including market-based pricing for grid services. In most of the countries in the region, OA is either loosely defined or non-existent. During the initial phases of liberalization, the SB model should serve as an interim step in the transition to a more competitive wholesale market, but it must eventually be replaced to harness the efficiency of market outcomes for the benefit of consumers.

OA and associated issues: For OA to be non-discriminatory, transmission should be separated from generation, distribution and retail functions, preferably through ownership unbundling, or otherwise functional unbundling. International markets offer a wealth of experience in both approaches and either model can be adopted, depending on political, regulatory and commercial considerations. The functional unbundling approach may involve creating a new business unit within a vertically integrated structure. In this case, a strong regulator needs to ensure that system operation functions are conducted as transparently as possible. A strong code of conduct should also be developed to ensure clear separation of the various business lines, based on existing best practices.

Capacity allocation: Single window allocation of cross-border transmission capacity is considered more efficient in allocating resources. Numerous regional markets have developed single-window platforms for allocation and congestion management of interconnection capacity, including the U.S. through independent system operator (ISO)/ regional transmission organizations (RTOs) and the EU through the Joint Allocation Office and the appropriate network codes. Single window systems require participating countries to give up a degree of sovereignty over the allocation of cross-border transmission capacity. This is often cited as the biggest challenge to a centralized allocation process. However, this offers the best outcome for consumers in the region.

Energy-only vs. capacity market: Electricity markets should be designed to incentivize sufficient investment in new capacity. The U.S. experience of implementing 'energy-only' market systems suggests that short-term price signals in the spot market may not provide enough incentive for investments in generation or transmission. A locational marginal pricing model has helped increase investment to some extent. Capacity markets offer another acceptable solution to the 'missing money' problem for investors. Theoretically, this can also be addressed by allowing energy prices to reach exorbitant levels during scarcity conditions — as in one instance when prices hit US\$10,000/MW in the Electricity Reliability Council of Texas market. However, such scarcity prices may be politically unsustainable in many other markets. Furthermore, with downward pressure from low- or zero-marginal cost renewables, capacity markets will likely become more prevalent. However, participants in the capacity market should face sizeable penalties for non-delivery.

Capacity market through power purchase agreement (PPAs): In the Gulf region, PPAs serve as a key mechanism to build additional generation capacity. Upfront competition in the bidding process determines the strike price of a PPA, but this approach may not ensure long-term efficiency in the absence of a truly competitive capacity market. Opaque PPA models set prices that are invisible to market participants. Thus, PPAs may not be advisable for long-term market development, and a more efficient price discovery mechanism will become necessary in future.

Moreover, gradually converting physical bilateral contracts into financial ones is a critical element in market development. The primary objective of physical contracts is to enable the generators to obtain loans from banks for plant construction and modernization. However, based on international experience, physical contracts impede the transition to a market-based electricity system. To transform these contracts into financial ones, a compensation system of side payments can be used to induce generators to relinquish their physical contracts and sell their output through market mechanisms. This solution aims to make generators financially indifferent to the choice between either their existing physical supply contracts or selling their generation through bilateral contracts or the spot market. Such conversion must be ratified by the banks that accepted the physical contracts as security for loans granted to the generators.

Decoupling wholesale and retail competition: A well-functioning regional electricity market does not necessarily require its retail and wholesale segments to develop at the same pace. For example, in the U.S., several states have very healthy competition in wholesale electricity markets but not in retail, while in other states the opposite is true. Yet in both cases, the states engage in interstate/regional electricity trading. This illustrates that developments in one market segment are not tied to another. However, reforming or developing retail and wholesale segments together provides better incentives for a more coherent and coordinated development of the electricity market. While wholesale markets in the Gulf region have introduced limited competition in the form of ‘competition for the market’ (except for Oman, which also plans to implement a day-ahead spot market in 2020), competition in the retail market is largely absent.

Rationale for market integration: The objectives of developing a regional electricity market need to be collaboratively developed and ratified by the participating countries. For example, do they aim to improve energy security, attain climate change goals, achieve reliable price formation, or improve arbitrage and portfolio optimization? A clear articulation of integration objectives will help policymakers design appropriate market rules and identify areas requiring harmonization.

The Impact of Regional Institutions

Based on experiences observed in Europe, the U.S. and other parts of the world, regional institutions play a vital role in successful market integration. The GCC and MENA can benefit from applying the following lessons drawn from these case studies.

A regional institution created under some form of legal framework can facilitate cooperation and coordination among participating countries more effectively than any voluntary organization. The Agency for the Cooperation of Energy Regulators (ACER) in Europe offers a useful example. EU law established ACER to serve as a central institution to support the development of a single energy market to benefit all EU consumers. ACER defines the guidelines for transnational electricity networks and markets, while national regulators remain empowered to set the rules within their jurisdictions. The agency also assists the national regulatory authorities and coordinates their work on EU-wide and cross-border issues. In 2011, it also took responsibility for monitoring wholesale markets. ACER's success can be attributed largely to the unwavering support of the European Commission and the commitment of EU and national policy institutions.

The European Network of Transmission System Operators for Electricity (ENTSO-E), another central institution representing European TSOs, facilitates technical cooperation between TSOs to ensure overall alignment of grid codes and other technical frameworks. Its other important responsibilities involve the coordinated development of long-term pan-European network plans, coordinating research and development (R&D) plans, alongside programs to support innovation and other such activities (ENTSO-E 2019a).

The roles and mandates of ACER and ENTSO-E have evolved over time and with changing priorities, but both maintain institutional independence.

According to the founding regulations of ACER, its board of regulators does not take instructions from any government of a member state, from the European Commission, or from any other public or private entity (ACER 2019). ENTSO-E functions on a non-profit basis and is governed by an assembly representing all TSOs and a board of elected members (ENTSO-E 2019b). The GCCIA, a joint stock company owned by the six GCC states, has played an important role by supporting its members in addressing technical issues in system operation, including cross-border interconnectors.

The workshop suggested the creation of a regional institution with a mandate to expedite the development of a well-functioning, integrated electricity market in the GCC (or wider MENA) region:

Harmonization of frameworks

For the successful implementation of a regional market, it is desirable to harmonize national frameworks where necessary. To ensure the regional market functions efficiently and effectively, the following areas may be progressively aligned:

- Aspects related to system security, planning and grid operation.
- Regulations on network access conditions, including interconnections.
- Key principles of economic regulation for the electricity industry, with clear implications for cross-border electricity trade (e.g., capacity allocation and pricing of interconnections).

Supervise implementation and enforcement

If participating countries are not implementing their action plans, a regional institution needs to be reinforced with some mandate to supervise the implementation of required decisions. It should also coordinate with participating countries on the imposition of penalties, if any, for lack of compliance.

Dispute resolution

Provide a platform for participating countries to resolve their disputes on issues concerning the development of the integrated electricity market through negotiations.

Assessment and monitoring

Market surveillance is important to ensure that markets are run properly and no one is misusing or manipulating the market. A regional institution requires a mandate to monitor market performance and ensure that national measures take regional differences into account. It should also acquire the requisite competencies to execute its functions effectively.

About the Workshop

This workshop took place in Riyadh on October 22, 2019. It brought together over 40 regional and international experts to discuss the key issues relating to the formation of an integrated electricity market in the GCC and wider MENA region. It provided updates on the current status of electricity trade, and ongoing efforts to liberalize the electricity industry in the region. It also addressed market design and structure, regulation and system operation, and policy and political drivers.

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About the Team



Shahid Hasan

Shahid is a research fellow at KAPSARC. His current research focuses on electricity sector transitions in Gulf Cooperation Council (GCC) member states, and the development of a regional electricity market in the GCC and Middle East and North Africa (MENA) region. He has extensive consulting experience on policy, regulatory and market design issues for governments, electricity regulators, public utilities and the electricity industries in India and Southeast Asia.



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Turki is a senior research associate at KAPSARC focusing on energy transitions, electricity market regulation and policy, digitalization, power system modeling, and renewable energy policy. He has worked for several multinational companies including ABB and Woodward. Turki holds a Ph.D. in Electrical Engineering and an MBA from Colorado State University. Turki is a Senior Member of the Institute of Electrical and Electronics Engineers.

About the Project

KAPSARC has initiated a regional electricity market integration research project to explore the potential opportunities that could be harnessed by developing a common electricity market in the GCC and wider MENA region. It examines a range of issues relating to electricity market integration, including the experiences of other power pools and their potential application in the MENA region. The focus of the project is on understanding and examining electricity market policy and legislation, market design and structure, regulatory and system operations to identify best practices and to provide insights into policy and regulatory issues. Its various outputs are intended to fill existing knowledge gaps and facilitate ongoing efforts toward regional electricity market integration.



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