



VIRTUAL  
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**SIDE EVENT**

## CROSS BORDER POWER TRADE AND FUTURE ENERGY MARKETS

June 16, 2020 (Tuesday)

8 - 9:30 pm Manila Time (PST) / 7 - 8.30 pm Bangkok Time / 5.30 - 7 pm IST / 8 - 9.30 am EDT

### Q&A Summary

S. No.	Questions & Answers
1.	<p><b>Question:</b> Given the lack of existing infrastructure, and the very high cost of developing that infrastructure, has anyone done the cost-benefit analysis of building this infrastructure vs building out distributed renewables and storage options to achieve the same thing.</p> <p><b>Answer:</b> This was answered live. Refer to the webinar recording link at <a href="https://www.youtube.com/watch?v=gyEaYW7q_Iw&amp;feature=youtu.be">https://www.youtube.com/watch?v=gyEaYW7q_Iw&amp;feature=youtu.be</a></p>
2.	<p><b>Question:</b> India's cross border regulations required Indian entities to own at least 51% of the asset exporting the power. Don't such regulations limit cross border? Can you comment about motivation for India's sensitivity on ownership?</p> <p><b>Answer:</b> The requirement referred to i.e. entities exporting power from a plant based in neighbouring country to India should have at least 51% of the asset owned by the Indian entities <b>is no longer applicable</b>. This was a requirement as per the earlier "Guidelines on Cross Border Trade of Electricity" issued by the Ministry of Power on December 5, 2016. However, this requirement was removed in the revision of the Indian "Guidelines for Import/Export (Cross Border) of Electricity which came into effect in December 2018. Thus, there is no limitation on 51% ownership by Indian entities to export power to India from generating facilities located in any neighbouring country.</p> <p>Please refer to the 'Guidelines for Import/Export (Cross Border) of Electricity-2018- regarding' issued by Ministry of power on December 18, 2018'  <a href="https://powermin.nic.in/sites/default/files/uploads/Guidelines%20for%20ImportExport%20Cross%20Border%20of%20Electricity%202018.pdf">https://powermin.nic.in/sites/default/files/uploads/Guidelines for ImportExport Cross%20Border of Electricity 2018.pdf</a></p>

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3.	<p><b>Question:</b> Average Sell Bid are more than average Buy bid in RTM. Does this mean, there is more liquidity than demand or the sell bids are placed at a price than MCP.</p> <p><b>Answer:</b> Yes, there is more supply bids available than demand bids in the system</p>
4.	<p><b>Question:</b> With more renewables getting integrated in the network, how the countries are going to address the aspect of smart grid to ensure grid reliability in case of CBT. Failure in one grid can have huge impact on the other country's grid</p> <p><b>Answer:</b> It has been seen through experiences from other parts of the world that larger the grid, better is the reliability, provided rules, codes, reliability standards are followed by each of the power sector stakeholder religiously. Therefore, in a large synchronously connected grid, grid reliability improves, and renewable energy penetrations increases. In India itself, an interconnected grid throughout the country has improved the reliability, enhanced flexibility and enabled integration of more renewable energy. Cross-border power trade can also support integration of renewable energy. For example, Denmark offers a good example of how Cross Border Interconnection has been used as a major source of flexibility and an enabler for RE development and integration. In 2016, 80% of Denmark's wind generation was balanced through CBET in an economical manner by utilization of Norway's hydro resources. Smart grid technologies can become an enabler for intelligent management of the grid and enhance grid reliability.</p> <p>On the point of failure in one grid can have huge impact on the other country's grid, it can impact but with more integration and cross border trade probability are relatively less as compared to a scenario with no or less cross border grid interconnections. By the way, as a general grid management practice, area control limits are placed on cross border line to control the cross-border flows and ensure impacts are not passed on to another grid.</p>
5.	<p><b>Question:</b> Does cross border transfer of power involve frequency in it...if yet. How it will impact on power flow as frequency varies from country to country?</p> <p><b>Answer:</b> As we understand the question, it is enquired how the frequency of different country will be impacted due to the cross-border trade. In a synchronously connected regional grid, the frequency is same. In case of asynchronous interconnection frequency is immaterial. For example, the connection between India and Bhutan which is a synchronous grid, the frequency is same for both Bhutan and India.</p> <p>Secondly, there are adequate technical solutions and frequency control measures available to manage frequency deviation. Of course, best way to handle is through sound commercial and market mechanism where the power sector participants behaves in a disciplined manner and any deviation is heavily penalised.</p>
6.	<p><b>Question:</b> Without futures market, risk hedging is difficult in power markets, how do we counter this?</p> <p><b>Answer:</b> Financial products (such as futures, etc.) are a logical extension of an established physical electricity market to provide hedging against price and volume risks. Since financial products are linked to underlying physical market operations, it requires a credible track record of electricity market operations before financial products can be introduced reliably. Financial derivatives will thus follow through in most countries which begin with a wholesale electricity market.</p>
7.	<p><b>Question:</b> How you will evaluate the actual requirement of power in South Asia and Southeast Asia.</p> <p><b>Answer:</b> Most of the county have their own power sector projections. For regional assessment, a detailed modelling study should be carried out to assess regional requirements and potential for power trade. For South Asia, we have undertaken various studies. Please refer to our website <a href="https://sari-energy.org/">https://sari-energy.org/</a>.</p>
8.	<p><b>Question:</b> How we intend to resolve spatial challenges across Borders when even there are many road block within the country. I feel we can bring transformation by adopting transparency in the modern digital Era.</p> <p><b>Answer:</b> Agreed, Transparency always improves the process of integration. USAID's SARI/EI program is working towards improving data transparency and accessibility. SARI/EI is developing a database i.e. "South Asia Energy Knowledge Resource Database", which will be a single point, user-friendly platform</p>

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	<p>which enables data analytics for energy data and information related to the South Asia Energy/Power Sector for benefit of all stakeholders and public at large. It aims to reduce information and data asymmetry, promote data transparency, help high quality data research and analysis and act as information repository for the energy sector in South Asian Countries and provide regular updates through collective effort of the participating countries.</p>
9.	<p><b>Question:</b> Whether ADB, World Bank, JICA, etc. or private banks like IFC wish to take project risk where certain or all of its off-take would be based on cross country energy exchange? If so, what are the covenants and goalpost that has to be complied?</p> <p><b>Answer:</b> There is an appetite to take risk to a certain degree for cross country energy exchange projects. For example, the Dagachhu Hydro Power Project in Bhutan was developed on PPP mode with financing support from <a href="#">ADB</a>. The Dagachhu hydropower project—a joint venture between Druk Green Power Corporation of Bhutan and the Tata Power Company Limited (TPTCL) of India—has a 25-year power purchase agreement to export of power generated from Dagachhu Hydro Power Project in Bhutan to India. The Asian Development Bank (ADB), under the South Asia Sub regional Economic Cooperation (SASEC) program, <a href="#">funded</a> the construction of Dagachhu hydropower plant through the Green Power Development Project, a USD 145 million loan and grant package approved in 2008.</p>
10.	<p><b>Question:</b> What is the impact of the recent commissioning of 11 renewable energy management centres in India on integrating large scale VRE?</p> <p><b>Answer:</b> REMCs in India have been beneficial in improving the visibility, control and forecasting of renewables at the regional level. At the regional and national level, they have also improved the capabilities of System Operators to analyze and assess reserve requirements, which is an important input to Ancillary Services.</p>
11.	<p><b>Question:</b> Kindly request additional information or comments on ASEAN Regional Grid Power cooperation please.</p> <p><b>Answer:</b> There are several efforts within ASEAN to build out the grid and the institutional cooperation. Specifically, the efforts on cross-border power trade and building of the ASEAN Power Grid is led by HAPUA and APGCC <a href="http://hapua.org/main/">http://hapua.org/main/</a> for specific questions on the APG feel free to reach out to <a href="mailto:randi.kristiansen@iea.org">randi.kristiansen@iea.org</a>.</p>
12.	<p><b>Question:</b> How do we define the fair price for electricity tariff which reflects every cost structure such as wheeling cost in case of congestion? How is the priority?</p> <p><b>Answer:</b> Market gets split if congestion is experienced in network and area clearing prices are discovered.</p>
13.	<p><b>Question:</b> Could you address what are the challenges remaining, challenges faced when it comes to enabling large scale VRE to the existing grid?</p> <p><b>Answer:</b> This has been a significant focus of the USAID GTG-RISE program in India with multiple innovation pilots addressing specific challenges to integrating VRE at scale on to the Indian grid. An important first step is to assess what the impact could be on a specific grid through grid modelling (<a href="https://www.gtg-india.com/power-system-planning-reforms/">https://www.gtg-india.com/power-system-planning-reforms/</a>). The variability of VRE requires improvements in VRE forecasting and harnessing flexibility from all other parts of the power system to balance the grid, including making conventional generation more flexible, faster grid dispatch, larger balancing area and markets, ancillary markets capable of providing flexibility and other grid support services and smarter and more integrated grid operations, etc. In the long run with VRE at scale, the challenge shall be on making VRE itself dispatchable to the extent possible (e.g., through hybridizing with storage) and to utilize storage at scale for grid balancing. These would be determined amongst other things on technological advances and market transformation of storage solutions.</p>

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14.	<p><b>Question:</b> What is the current status of multilateral discussions focusing on cross-border power trade and energy connectivity? What is the progress being made at the policy level?</p> <p><b>Answer:</b> In South Asia, there has been progress in discussions and agreement on frameworks to support cross border power trade and regional energy cooperation. Some of such agreements include AAARC Framework Agreement on Energy Cooperation (Electricity), Govt. of India's Guidelines for Import/Export (Cross Border) of Electricity- 2018, Memorandum of Understanding for establishment of the BIMSTEC Grid Interconnection facilitates trilateral power trade. Some recent policies such as GOI's Guidelines for Import/Export (Cross Border) of Electricity-2018 issued on 18th December 2018 is progressive and allows for trilateral power trade. Recently, the Government of Bangladesh has concluded price negotiation with hydropower developers in Nepal for import of 500 MW of power through India. These are all indication of progress in South Asia. Please follow SARI/EI's website for more information (<a href="https://sari-energy.org/">https://sari-energy.org/</a>).</p>
15.	<p><b>Question:</b> Trend of Pricing Reserve Capacity as a means for enabling higher renewable energy penetration keeping system security - should this be next development in electricity market and cross-border trade in Asia?</p> <p><b>Answer:</b> Yes, this is a priority. Good estimation of reserve requirements and its procurement are both fundamental elements of wholesale electricity markets and become extremely important with higher penetration of VRE. The world over, there is enhanced focus on making ancillary markets respond to specific needs posed by higher VRE. At a basic level, they affect the quantum of reserves to be procured but there is also increasing focus now on the type of reserve products required to meet challenges posed by higher levels of VRE.</p>
16.	<p><b>Question:</b> To discuss Pakistan perspective on Regional Cooperation and Integration for Cross-border Energy Markets, focused on emerging cross-border trends in Asia's energy sector, experiences with cross-border energy markets, as well as opportunities, challenges and priorities for developing power markets in Asia.</p> <p><b>Answer:</b> There is immense opportunity for cross border energy trade, please see SARI/EI report <a href="#">Potential for Power Trade in Western Part of South Asia: Techno-Economic Rationale</a></p>
17.	<p><b>Question:</b> Could we have a sense of market share for bilateral and competitive markets. How real is the risk of not getting what you want on the PX and how do participants hedge against that?</p> <p><b>Answer:</b> This question impinges on a fundamental factor within Electricity Markets referred to as Resource Adequacy. Market designs have addressed resource adequacy across shorter time frames by requiring market participants to demonstrate that they are adequately contracted coming into the real-time market. These contracting instruments can be physical contracts to begin with and over time develop into financial contracts as a hedging mechanism.</p>
18.	<p><b>Question:</b> What are the key factors to both push the power trading for cross border forward and what are the factors which is pulling the trading back?</p> <p><b>Answer:</b> The key factors to push cross border power trade is political will. There needs to be a clear instruction from governments to utilities and regulators to work on detailed frameworks to establish multilateral power trade (MPT). This can be done by establishing the economic benefits and the ability to achieve sustainable goals via MPT. The factors pulling it back can vary, but incumbent producers may be resisting MPT due to higher competition and the fact that they may be replaced by more effective production, this however will benefit consumers. In countries with low cost electricity there can be a fear of rising electricity prices, which does not need to happen depending on the trading model. Lastly technical arguments on the effects of power system operation can push back, however this too can be mitigated via common grid codes that establishes operational procedures.</p>

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19.	<p><b>Question:</b> With 23% Renewable share targeted for ASEAN region, will there be issue with respect to grid stability.</p> <p><b>Answer:</b> In an all equal world there potentially will be issues with respects to grid stability with increased renewables in ASEAN. Many ASEAN Member States have what can be classified as contractual inflexibility, which prevents alternative operations of their power systems. However, with developments in operational practises, cross-border power trade and general system enhancements reaching 23 % of renewables in ASEAN is possible in a secure way.</p>
20.	<p><b>Question:</b> In the context of COVID-19, where do participants see quick win solutions provided by cross border electricity trade and investments that complement national efforts for stabilizing power sectors, making them more resilient, and setting them on a path to financial and environmental sustainability?</p> <p><b>Answer:</b> COVID-19 while adversely affecting the energy sector, it has also reminded us the need to focus on sustainability. CBET can play a defining role in complementing the sustainability effort in the energy sector through optimization of clean energy resources and maximising use of renewable energy by supporting its integration. COVID pandemic opens up opportunity for investment in CBET projects to address sustainability challenges. Some of the quick benefits include investments in resilient, clean, and sustainable power systems which will eventually lead to financial and environmental sustainability.</p> <p>SARI/EI recently analysed the <a href="#">impact of COVID-19 on the South Asian power sector</a> and found that CBET and cooperation among SA countries supported in managing the demand- supply dynamics among the Bhutan-Bangladesh-India-Nepal (BBIN) countries in an effective manner. For example, the additional power, due to decline in the power exported to Bangladesh and Nepal, was absorbed by the Indian grid. Similarly, there was an increased export from Bhutan to India, especially during the 9 minutes 9PM event in India which enabled system operators to maintain the grid during the load fluctuations. Please refer to the paper <a href="#">9PM 9 minute Event</a> on SARI/EI website.</p>