



5TH EU-INDIA WORKSHOP SERIES ON "ENERGY REGULATION"

THE SIXTH DEBATE ON
"ELECTRICITY TRADE BEYOND BORDERS - WHAT IS THE SCOPE FOR INDIA?"



OCTOBER 29, 2021

PROCEEDINGS

Sixth online debate on “Electricity trade beyond borders - What is the scope for India?”

On 29th October 2021, the European Union (EU) - India Clean Energy and Climate Partnership (CECP) project in collaboration with the Florence School of Regulation (FSR) hosted sixth and the final of the six debate, as part of the 5th EU-India workshop series on Energy Regulations. The theme of the series is 'Enablers for India's Renewable Energy Transition: Competition and Market Design for the Power Sector'.

The sixth online debate was organized on the topic “Sixth online debate on “Electricity trade beyond borders - What is the scope for India?”, which was attended by over 100 participants, representing policy makers, regulators, power system operators, electricity trade organizations, utilities, think tanks, consultants, and academia.

1.1. Inaugural Session

Mr. Edwin Koekkoek, Counsellor, Energy and Climate Action, Delegation of the EU to India welcomed the participants to the sixth and the final debate of the series on behalf of the EU. He mentioned about the visit of Executive Vice-President for the European Green Deal, Mr. Frans Timmermans to India a week before, and his meetings where importance of clean energy transition for achieving climate objectives and importance of clean energy transition cooperation that EU and India were discussed. He briefed about the EU-India CECP project which works towards the integration of Renewable Energy and power markets. He further mentioned about earlier five debates conducted under this series and about the details being posted on the CECP website (<https://www.cecp-eu.in/>). He expressed his pleasure on hosting International Solar Alliance (ISA) as part of this webinar and mentioned about the Mr. Timmermans' meeting at ISA and his remarks at the opening session emphasizing upon the thrust from EU towards ISA and deployment of solar energy. Lastly, he thanked the organizers of the webinar series for conducting these interesting sessions and emphasized upon the importance of follow-ups post the series and maintaining continuity in the discussions on interconnection and going beyond the borders of India.

1.2. Panel Discussion

Prof. Leonardo Meeus, Deputy Director, Florence School of Regulation while sharing his experience from European perspective discussed on the following points through a PowerPoint presentation:

- Shared electricity trade across borders from the earlier years (late 1990s and early 2000s) in Europe. This witnessed steady increase over the years from 7.5% in the first year of its trade in 1998 to 10.3% in 2005.
- Most of the countries had monopolies which were supported by the respective governments and were already engaged in bilateral contracts, given the variability in resource availability for electricity generation.
- Electricity markets have helped improve exchange by adding hourly trading mechanisms.
- One of the academic studies has assessed that the magnitude of gains from market integration cross border trade is about Euros 3-4 Billion annually in EU.
- Quoting another study from South Asia, he mentioned that Indian region an annual trade of about USD 9 Billion could be achieved annually, which could involve about 90GW of capacity for trade.
- Resources available around India such as hydro in Nepal can help facilitate trade with India and other nearby countries.
- Another driver is seasonal difference in demand peaks in region around India, similar to Europe, which derives benefits from trade.
- In EU, creating regulatory authorities at national level and independent system operators have helped establish institutional framework. Further, with introduction of Agency for the Cooperation of Regulators (ACER) and European Network of Transmission System Operators for Electricity (ENTSO-E), EU was able to get into detailed coding of electricity exchange cooperation.

- These two agencies along with EU-DSO can help undertake grid plans and resource adequacy studies.
- Latest study has estimated that the Europe already has 35GW of cross border capacity in pipeline and will have an additional 50GW for the exchange.
- Europe has moved away from inefficient to single market coupling algorithm for day ahead stage and intraday, with some countries yet to be added.
- Europe has set the example by first integrating wholesale and then incorporating balancing in the system.
- The need for regional cooperation on system operations was realized in 2006 when the system disturbances almost led to a blackout in Europe.
- In 2022, the Regional Security Coordination Initiative (RSCI) and Regional Security Coordinator (RSC) would be merged into Regional Coordination Center (RCC) to support integrated regional system coordination.
- Discussed about the importance of network codes which help integrate power markets, supports seamless operations of power system, and helps harmonize connection rules.

Mr. Laurent Schmitt, President, Digital4Grids through his experience of integration of consumer-prosumer market with advent of renewable energy and experience in market system operations, shared following inputs with the audience-

- Renewable energy integration and supply to the grid, especially from large scale projects leads to difficulties related to intermittency; and highlights the concern around adequacy on ways to maintain grid stability.
- Current energy crisis in Europe is also due to the low amount of wind in last few months.
- There is growing dependency from one country to another for energy management and hence highlighting the importance for regional cooperation.
- Larger amount of renewable energy such as wind flowing down towards south has indirectly benefited in lowering the prices of electricity in entire Europe.
- With interconnection, better utilization of renewable energy can be supported.
- Increase of renewable energy in power system indirectly drives the further need for trade across the border and supports interconnection in the systems.
- It is important to have entities to allow for coordination for cross border cooperation, wherein TSOs, grid operators are cooperating together.
- Technical willingness and political willingness together can help improve cross border cooperation and ensure shared benefits.
- India and neighboring countries can work upon the political and technical cooperation to enable cross border investments.

Mr. S. K. Soonee, Advisor, POSOCO, as a practitioner, shared India’s perspective and highlighted the challenges a development country like India faces with following points:

- There is a need for institution, systems, and processes to allow for successful power trade, including financial settlement.
- India with 30 states had similar problems as EU with multiple countries faced since each state has in place its own imperatives, regulators, resource mix, etc. and the concern was around bringing all together in a market.
- He highlighted the importance of scheduling, accounting, metering with time blocks (hourly/15-minutes/5-minutes, etc.), and settlement of transactions in power system operations.
- Further, the fundamentals of efficient power system operations include the mechanism to evaluate transmission charges (in kind or cash) and losses, and handling deviation (square off or cash out), along with pricing mechanism for deviation.
- The achievements of EU of coupling of markets highlight the way to start with basics and ramp up gradually.

- On the market front, many products such as day ahead market, term ahead market, ancillary services, etc. can be framed.
- BBIN (Bangladesh-Bhutan-India-Nepal) have been interconnected but basic elements of market like scheduling and dispatch, deviation handling, etc. have to be put in place for other three countries as well, similar to India.
- It is important to assess the reasons restricting market from ramping up in desired way in India despite having linkages, framework agreement, policies of all the countries, regulations, and market platform.

Jagjeet Sareen, Assistant Director General, International Solar Alliance (ISA) shared his perspective from the view of global interconnectivity of grids foreseen through One Sun One World One Grid (OSOWOG)–

- He briefed the audience about ISA which now has 100 member countries with more members are getting added.
- The ambition of ISA is to solarise the globe, help countries address three key energy/developmental challenges - energy access, energy security and energy transition.
- He mentioned that most of the countries are facing either or all of the challenges.
- ISA is offering a global multi-lateral platform to help countries.
- Institutionalization of OSOWOG would be a major step change platform solution in the push for energy transition, renewable energy and help countries benefit their economy, more jobs and investments could be released.
- At first assembly of ISA, Hon’ble Prime Minister of India Mr. Narendra Modi coined the concept of OSOWOG as sun is shining in some or the other part of the world throughout the day.
- Sun could be used as a live battery if major regions of the globe are interconnected by Interconnecting renewable energy power centers with demand centers.
- He quoted an example that when India witnesses power demand peak during evening hours, electricity from Oman can be drawn through GCC and can have efficient trade of electricity, which is technically possible.
- For OSOWOG, ISA has partnered with The World Bank Group and the Ministry of New and Renewable Energy (MNRE), Government of India to conduct a techno-commercial study to assess possibilities of such trades and also to look at GHG emission reduction, growth, jobs, etc. and then institutionalization of this idea.
- ISA is also looking at pre-feasibility of studies of few pilots in eastern and western parts of India with neighboring countries on green power pool.
- It is important to agree on timelines with various institutional bodies to enable interconnecting between countries.
- He further informed that At COP26, Hon’ble PM of India, Mr. Narendra Modi and Hon’ble PM of UK, Mr. Boris Johnson would launch a broader initiative – Green Grid Initiative (GGI) – One Sun One World One Grid (OSOWOG), where ISA and Government of UK would be joint secretariat and would also involve setting up of inter-ministerial committee to take the initiatives forward.
- ISA undertook analysis of electricity trade in South Asia which accounted to 18TWh (Terawatt hour), mainly contributed by India through bi-lateral trade with Bhutan, Nepal, and Bangladesh; however, a huge potential is still untapped.
- Regional interconnections, particularly import of renewable energy, would play a critical role in national decarbonization pathways.
- India can leverage a lot from South American electric interconnections, Southern Africa power pool and EU experiences.
- ISA plans to convene a meeting of South Asia power secretaries and regulators with South-East Asian countries in first quarter of 2022, as the first step for GGI-OSOWOG initiative to assess if east of South Asia can be connected.

1.3. Questions and Answers

There were few questions asked by the moderator, based on the questions received from participants, from the panelists.

- **Question** – From your experience, what lessons can India learn from Europe through evolution of network codes over the years?
 - **Response from Leonardo Meeus**
 - On transmission, initially in Europe, there existed national transmission tariff for payment of all investments of a country, which were charged to consumers but charging for cross borders was not clear. These were then charged through transaction charges.
 - These transaction charges were replaced with compensation mechanism, however this also had scope for improvement which was discussed within stakeholders.
 - Now, when a new asset is built, Cross border cost allocation mechanism helps countries voluntarily agree on cost sharing mechanism. ACER has also been given powers to intervene in case of any dispute between countries.
 - Balancing, initially, was not considered as a real market but a mechanism. There existed strong incentives, and penalties on all trading parties to ensure balancing, and hence a lot of portfolio management was being undertaken by the market players. However, the system has evolved to a system where everyone has to share their balancing resources to a pool of balancing, and hence the penalties have been reduced and increased the real time market for balancing.
 - The vision in Europe was always about ensuring energy security, given high dependence on imported fossil fuels such as gas.
- **Question** – Requested to share views on shared vision and sharing of costs and benefits, building projects of common interest.
 - **Response from Laurent Schmitt**
 - Europe is the first continent to share a vision of interconnecting countries in an optimal way, including gas network, and potentially green hydrogen in future.
 - Europe is aligned on the targets of Net Zero by 2050, and the trajectory has been architected by DSOs of electricity and gas industry.
 - Highlighted the first interconnection which was created between European countries – France, Switzerland, and Germany to balance and utilize electricity between these countries.
 - He further suggested South East Asian markets to gradually work on strong vision of interconnection, assess benefits of interconnection for all the contributing countries.
 - He added that technology is not an issue, but the challenge is to raise capital and create trust along with worldwide market.
- **Question** – What are the learnings for India going forward?
 - **Response from S. K. Soonee**
 - He mentioned that the connection links were built for security, reliability, and resilience.
 - He emphasized that calamities such as earthquake in Nepal, recent pandemic are the times when neighboring countries can help others.
 - There was clarity within utilities, even before markets had come up, that it is important to operate the power system economically, maintain the quality and security and reliability of supply to consumers, which still holds valid.
 - Resource adequacy and portfolio management is fundamental, irrespective of market exists or not.
 - Before market had come up, the utilities were already aware about operating cost of all machines, valve point loading, ramp rates, limits under which generator could be varied.

Further, every utility was undertaking security constraint, economic dispatch, and had Area Control Error (ACE) for managing the networks.

- He suggested that every entity should carry out its own portfolio balancing and economic dispatch in a scientific manner and then assess if these can be coupled, along with further savings.
- **Question** – Requested for inputs on hydrogen and other clean energy vectors; and as ISA the role that can be contributed to the transition on interconnectivity.
 - **Response from Jagjeet Sareen**
 - It is important to build on the experience and push key stakeholders, including practitioners, politicians, etc. to accelerate the transition on interconnection and cross border trade.
 - ISA is promoting generation of hydrogen, mainly green, through solar to produce it. This would also support grid balancing and intermittency. Further, small, and large businesses can also setup solar and electrolyzers for hydrogen.

1.4. Closing remarks

Mr. Matthieu Craye, International Relations Officer, DG ENER, European Commission, thanked all the panelists for the rich discussion and for sharing experiences. He also highlighted that it is important to move gradually but maintain a pace to ensure desired goals are achieved. Further, he reiterated the point made by Mr. S.K. Soonee that it is important to avoid over-engineering. He mentioned that in order to arrive at the most optimal use of interconnection, it would be important to consider technical assessment, regulatory interventions, market organization, etc. It would also be pertinent to draw experiences from other parts of the world. In terms of institutions, it is important to work towards shared vision and cooperate together similar to ACER and ENTSO-E in Europe which can ensure smooth progress on the interconnection. He emphasized upon EU’s keenness in continuing to partner with India on interconnection, giving a reference of meetings at Ministry of Power, POSOCO, PGCIL, CERC, etc. He added that during ISA Director General, Dr. Ajay Mathur’s visit, it was agreed that the European Commission would be participating in the steering committee, utilizing the European experience for other parts of the world.

He concluded his remarks by highlighting that as next steps dialogue would be carried with partners in India such as CERC. Further, a report summarizing the key takeaways from all the debates can be compiled, extending best possible support to India in power markets, and beyond the borders as well. In addition, a number of deep-dive seminars can be conducted based on topics agreed with the Indian partners. He also mentioned about another work being carried out by EU on smart grid replication roadmap and handbook. Matthieu discussed about possibilities of work with Ministry of Power and MNRE where interconnections can be looked at more closely.