


Cooperation and Collaboration

Ushering in an energy-secure South Asia through regional power markets

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April 14 is celebrated as the start of the new year and signifies auspicious beginnings in many parts of South Asia. This year, the date also heralded the beginning of a new era for the region's power market. The Nepal Electricity Authority (NEA), the country's power utility, joined the energy exchange market through India's power trader, NTPC Vidyut Vyapar Nigam Limited (NVVN). This first-of-its-kind initiative is a significant step in evolving cross-border electricity trade (CBET) in South Asia.

This has made Nepal eligible for purchasing electricity directly from India's power exchange at a competitive price. It began after the Procedure for Approval and Facilitating Import/Export (Cross Border) of Electricity by the Designated Authority was issued by the Central Electricity Authority (CEA) on February 26, 2021. The first transaction took place on April 17 for about 1 MUs, which more than doubled the next day to 2.9 MUs. This is a milestone for Nepal's energy development, and for creating a vibrant regional power market in South Asia.

Trust and cooperation as cornerstones for Indo-Nepal power trade

Indo-Nepal power trade goes back to 1971, when the two nations signed the Power Exchange Agreement, which enabled both countries to import and export electricity on the basis of need. In 2014, an agreement on Electric Power Trade, Cross-border Transmission Interconnection and Grid Connectivity between the two countries led to the creation of a power/energy secretary-level joint steering committee and a joint secretary-level joint working group. These groups promoted and facilitated cooperation in various areas, including planning and identifying potential cross-border interconnections, transmission technology selection, project report preparation, and investment for timely project implementation. A joint technical team was formed for the preparation of a long-term integrated transmission plan covering projects up to 2035.

The two nations further cemented their power trade ties in September 2019 when they inaugurated South Asia's first

cross-border petroleum products pipeline, which connects Motihari in India to Amlekhgunj in Nepal.

A power trade agreement was signed in 1997 between the two countries. A revised power trade agreement was signed between them in October 2014. This envisaged the import of electricity from the 400 kV Dhalkebar-Muzaffarpur transmission line through NVVN. Nepal and India have also been exchanging electricity via more than one dozen lower voltage transmission lines.

Nepal's foray into the Indian power exchange market – A watershed moment for regional energy cooperation

Nepal's entry into the Indian power exchange day-ahead market commemorated a new beginning for power trade in the region. The power sector in South Asia currently stands at an inflection point. Decarbonisation of the power sector is crucial for the economy and the people as we build back a sustainable and climate-resilient future after the pandemic. Despite being one of the fastest-growing regions in the world, per capita electricity consumption in the region is around 915 kWh – about one-third of the 3,000 kWh per capita global average.

So far, the CBET between these countries has been primarily through power purchase agreements, signed as part of special memorandums of understanding between the governments. Nepal, despite its significant hydro generation, has been trying to meet its electricity demand through high-cost imported diesel. But the overall generation supply in the country is still inadequate to meet demand, and Nepal has continued to rely on imported power from India.

A 2017 study by Integrated Research for Action and Development (IRADe) for the United States Agency for International Development's (USAID) South Asia Regional Initiative for Energy Integration (SARI/EI) programme indicates that accelerated power trade (APT) between the two countries will be a win-win. For Nepal, an APT scenario for the year 2045 will result in optimum utilisation of its hydropower potential. An APT scenario would increase the share of industry in the nation's GDP to 30 per cent, as compared to a 21 per cent share in the normal trade (non-APT) scenario. This means increased industrialisation, more employment, technological modernisation, skill development, and an estimated per capita electricity consumption increase of 50 per cent by 2045. For India, the benefits would accrue in the form of cleaner energy, with coal-based generation slated to decrease by 5.1 per cent, as estimated by the study. The APT would also reduce installed capacity requirements for each country due to optimisation, and increase power system operation efficiency.

Since 2000, USAID's South Asia Regional Initiative for Energy (SARI/E) has been working closely with all South Asian countries to foster trust and promote cross-border power trade, energy access and clean energy development. Over the past few years, the programme, in its current form as SARI/EI, has been working with stakeholders from the two countries – such as the Government of India's Ministry of Power (MoP); the Central Electricity Regulatory Commission (CERC) of India; the Government of Nepal's Ministry of Energy, Water Resources and Irrigation; the NEA; the Indian Energy Exchange (IEX); and NVVN – in addition to the other South Asian nations, to foster the creation of a regional power market and power exchange-based trade in South Asia. Close collaboration over the years through meetings, study tours, workshops, focus groups, studies and reports have facilitated closer cooperation and consensus among stakeholders from both countries.

Increasing acceptance of CBET among policymakers in South Asia

Over the past decade, governments and decision-makers across South Asia, not just India and Nepal, have acknowledged the importance of increasing power trade and have steadfastly taken steps to achieve energy security through cooperation. Their efforts have not been for nothing – the region now heralds 3,800 MW in traded power, three times the installed capacity in Nepal.

The first milestone towards achieving this landmark was the signing of the Inter-Governmental Framework Agreement for Energy Cooperation by the foreign ministers of the eight South Asian Association for Regional Cooperation member states in November 2014. This agreement was proof that the region's governments were keen to enhance power trade.

As the centrally located country and largest energy user, India had to play a vital role if South Asia was ever to truly achieve regional integration. The Government of India acknowledged this and, therefore, cross-border energy trade plays a key part in the Government of India's South Asia-focused "neighbourhood-first" policy. In December 2016, the Indian MoP framed the guidelines for cross-border electricity trade, updating them in December 2018 to make them more liberal, in response to comments from neighbouring nations. In March 2019, the CERC published CBET regulations, with the CEA notifying the Procedure for Approval and Facilitating Import/Export (Cross Border) of Electricity by the Designated Authority in February 2021 to complete the process of facilitating cross-border trade in electricity.

A South Asian regional energy market can be the pillar of an energy-secure region

Although the vast number of bilateral contracts have helped South Asian countries establish significant trade, a day-ahead market (DAM) through the power exchange could lead to optimisation during the day. Day-ahead trading would enable countries to overcome any impact on the grid caused by unforeseen situations, such as tripping of generating units and unforeseen demand increases due to weather changes.

Power exchanges have offered a fair, transparent and neutral platform at the national level in India, which has resulted in efficient price discovery of electricity. With innovative regional market

products, such as the real-time market, a South Asia regional energy market can improve the overall viability of renewable energy investments in the region. Once South Asian countries form an interconnected system, an open marketplace would immensely benefit cross-border electricity trading to facilitate efficient, transparent and reliable prices. It would also boost investor confidence in developing generation and transmission projects.

The SARI/EI programme, with participants from Bangladesh, Bhutan, India and Nepal, carried out an exercise of a DAM through a mock South Asia regional power exchange model to explore the feasibility and desirability of a regional power exchange for those countries. This first-of-its-kind exercise extracted the actual aggregated bids from the IEX and realistic bids from Bangladesh, Bhutan and Nepal. Adding these three countries to the IEX generated a producer and consumer surplus total of Rs 323.63 billion (approximately $4,430 billion).

The mock exercise demonstrated that a regional power exchange based on DAM can capture the demand and supply complementarities of these countries to effectively utilise available power generation in countries where power is needed, and offer dynamic and transparent buy and sell prices. Thus, a CBET DAM would yield efficient price signals, transparency and major distributive benefits in terms of decreased overall costs.

Capacity building is fundamental to a robust regional power trade

Today's success has not come overnight. The path started with building trust and understanding between the countries and improving overall operations. The SARI/EI programme, which was launched in 1999 in Kathmandu by the United States Energy Association (USEA), focused not only on clean energy trade but also on energy efficiency, rural energy supply, energy regulation, energy statistics and private sector involvement. Two decades later, the region has made enormous progress in all of these areas, and is now reaching the ultimate goal of regional power trade and security. But we must not lose sight of the need for further support through capacity building. The USEA has been providing ongoing support to the key players from Bangladesh, Bhutan and Nepal to expose and train them on best practices in the areas of CBET and regional market development. Most recently, two training programmes were completed for Nepal on establishing a power trading entity. Thirty participants, primarily from the NEA, attended sessions on electric power production, transmission, distribution and utilisation; organisational operations, petroleum exploration, production and transportation; and natural gas exploration, production and transportation. Exposure to power market platforms and Indian power exchanges was fundamental to the training. Another round of almost identical training is scheduled for August 2021 – yet another step in building a robust network of professionals to take the region's energy sector forward. While the South Asia region still has miles to cover in creating a regional energy market, the recent developments have surely moved this dream closer to reality. ■

(SARI/EI is a long-standing programme of USAID, since 2000. IRADe and USEA are implementing the current and fourth phase of the programme 2012-2022.)