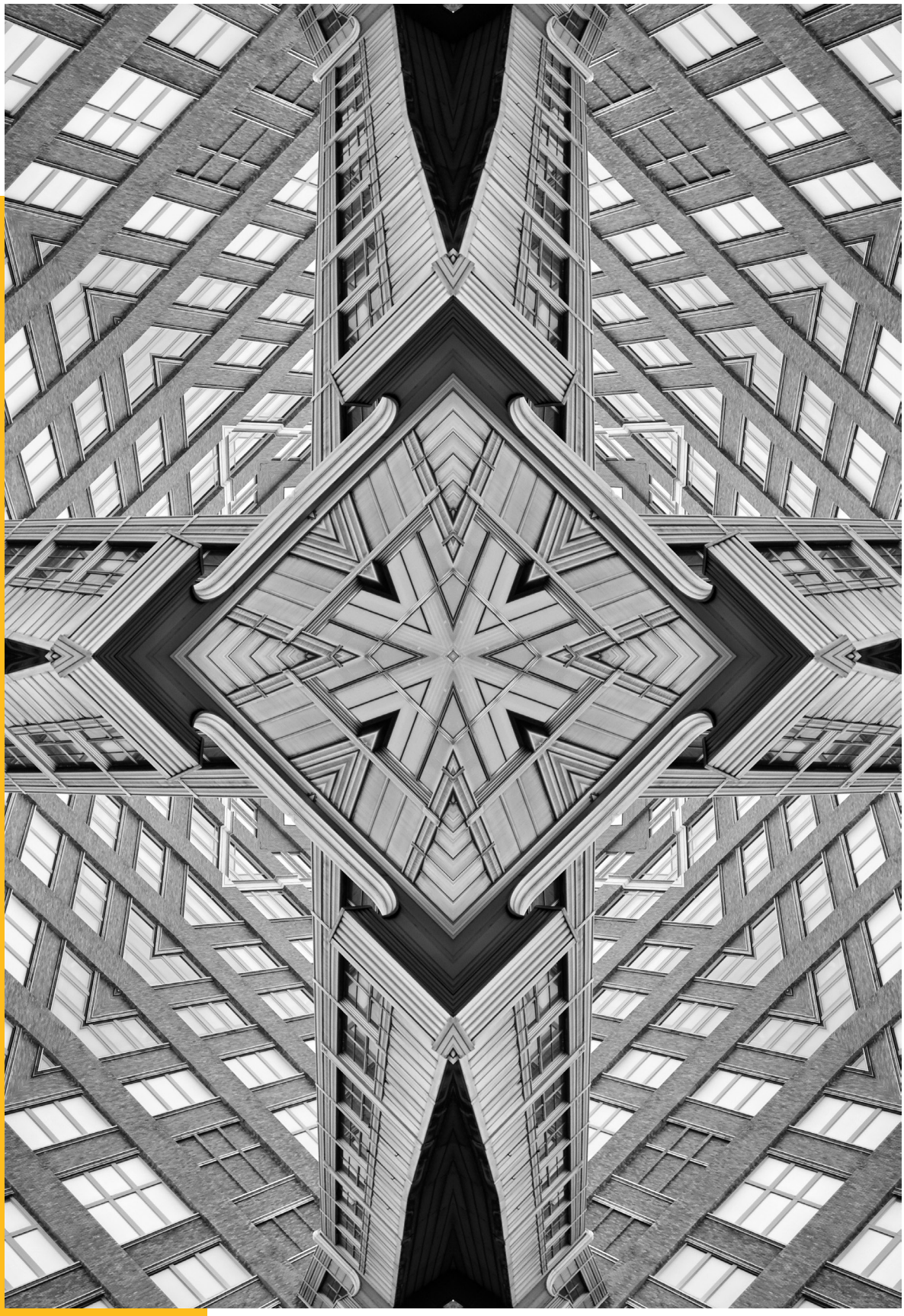
ORF OBSERVER RESEARCH FOUNDATION

Occasional Paper



ISSUE NO. 326 AUGUST 2021

Building a Regional Approach to Energy Security for BIMSTEC

Roshan Saha and Anasua Basu Ray Chaudhury

Abstract

The seventh of the Sustainable Development Goals (SDGs) aims "to ensure access to affordable, reliable, sustainable and modern energy for all" by 2030. Such quest for energy security is echoed in subregional strategies as well; in the BIMSTEC region, it is a key priority. As the gap in electricity supply and demand increases in the countries of BIMSTEC, trans-border cooperation can help diversify energy sources, reduce the average cost of supply, and meet peak demands. This paper examines the current state of cross-border energy cooperation in the region, identifies the challenges to electricity trade between the countries, and explores opportunities for mutually beneficial energy cooperation.

Attribution: Roshan Saha and Anasua Basu Ray Chaudhury, "Building a Regional Approach to Energy Security for BIMSTEC," *ORF Occasional Paper No. 326*, August 2021, Observer Research Foundation.

Introduction

Energy security is a key component of national security[a]—both politically and economically. It is defined by the United Nations (UN) as "the continuous availability of energy in varied forms, in sufficient quantities and at affordable prices."[1] The 2030 Agenda for the Sustainable Development Goals (SDGs) has a battle-cry: "Leave no one behind." This is true for energy security as well, which is listed as SDG 7: "to ensure access to affordable, reliable, sustainable and modern energy for all."[b] One key target of the SDG 7 is to enhance international cooperation in facilitating access to clean energy and promoting investment in energy infrastructure.[2] Globally, 22 percent of the population are without access to electricity—a significant share of whom are from the BIMSTEC nations, i.e. Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand. As of 2019, Bhutan (99.9 percent), Thailand (99.9 percent), Sri Lanka (99.9 percent) and India (97.8 percent) have achieved near-universal access to electricity. Meanwhile, Myanmar (68 percent), Nepal (89 percent), and Bangladesh (92 percent) are lagging.[3] Thus, energy security is a key priority for these countries, with a need for increased focus on trans-border energy cooperation, particularly, electricity sharing, which can play an important role in ensuring a steady supply of electricity in the region. This is especially important since the demand for electricity is likely to outpace supply by 2030.[4]

The BIMSTEC region is endowed with abundant coal, natural gas, biomass, hydropower and renewable energy potential, largely concentrated in the contiguous BBIN area (Bangladesh, Bhutan, East and Northeast of India, and Nepal). However, according to the global SDG index rankings, the BBIN countries are still facing "major challenges" or "significant challenges" for achieving the SDG 7,

a The notion of energy security can be defined in two ways: as a subset of national security, and also in terms of an economic concept. Energy becomes a national security and foreign policy issue when the increasing scarcity of natural resources for energy consumption affects a country's governing policies, which also are affected by how it uses and imports energy. On the other hand, the economic understanding of energy security tends to be more concerned with the price and supply measures of energy. These two concepts are intertwined.

b The SDG 7 focuses on achieving five major targets by 2030: ensure universal access to affordable, reliable and modern energy services (7.1); increase the share of renewable energy in the global energy mix (7.2); double the global rate of improvement in energy efficiency (7.3); enhance international cooperation to facilitate access to clean energy research and technology (7.a), and promote investment in energy infrastructure and clean energy technology (7.b). Several services rely greatly on access to energy including healthcare, education, water and sanitation (SDG2–4, 6–7, 9); improved household incomes (SDG8); and resilient rural and urban livelihoods (SDG1, 11).

thus leaving scope for improvement.[5] Most BIMSTEC countries are dependent on imports to meet their primary energy needs,[c] especially oil from the Middle East. Table 1 shows fuel imports as a percentage of merchandise imports for the BIMSTEC states.

Table 1: Fuel imports as a percentage of merchandise imports

Country	Percentage of merchandise imports
Bangladesh	10.9 percent (2015)
Bhutan	18.4 percent (2012)
India	35.3 percent (2018)
Myanmar	20.7 percent(2018)
Nepal	15.7 percent (2017)
Sri Lanka	15.6 percent (2017)
Thailand	17.8 percent (2018)

Source: World Bank, Energy Imports, Net (% energy use), World Development Indicators, https://data.worldbank.org/indicator/EG.IMP.CONS.ZS

While intra-regional trade increased from 5.50 percent in 2010 to 7.2 percent in 2019, the disruptions caused by the COVID-19 pandemic have led to a return to the declining trend.[6] The situation is exacerbated by tariff and non-tariff barriers to energy trade.[7] Cooperation in trade can overcome the mismatch between energy demand and energy resource endowments within the region.

This paper provides an overview of the present energy scenario in the BIMSTEC region; explores the scope of cross-border electricity trade (CBET) amongst the BIMSTEC countries;[d] analyses how the experience of regional energy cooperation initiatives such as the Nord Pool and the Southern African Power Pool (SAPP) can be used to build the BIMSTEC energy grid; and explores the political, economic, security, and environmental challenges in the region that have impeded subregional energy cooperation.

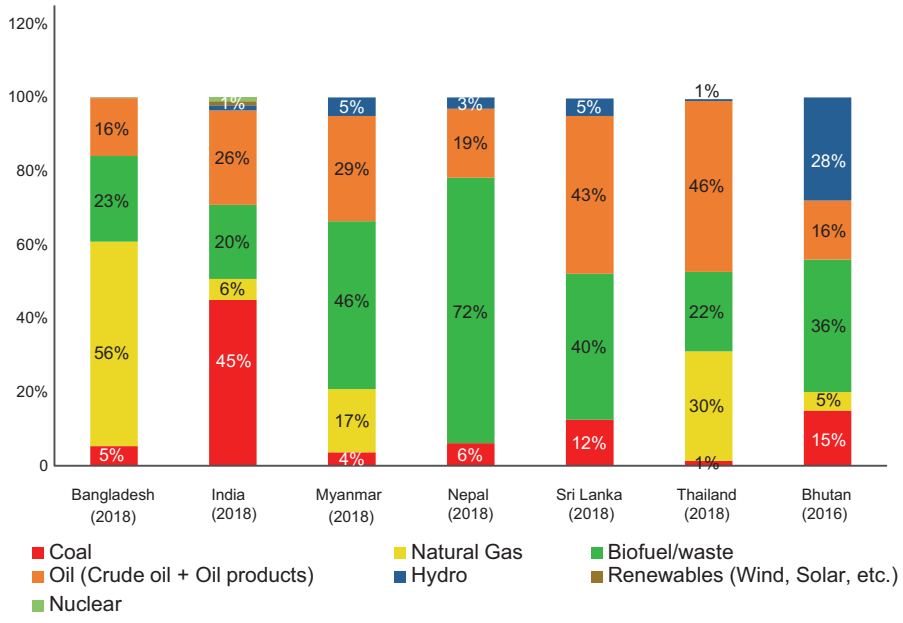
c Primary energy supply is defined as energy production, plus imports, minus energy exports, international bunkers and taking account of changes in stocks. These projections have been obtained from the BIMSTEC Energy Outlook 2030.

d Only in conventional energy sources, and not the renewables.

The State of Energy Security in BIMSTEC Countries

The Bay of Bengal (BoB) region is abundant in natural resources: coal at 324 billion tonnes, oil at 664 million tonnes, natural gas at 99 trillion cubic feet, biomass at 11 billion tonnes, hydropower (large) at 328 GW, and renewable energy potential of more than 1,000 GW.[8] Based on the estimates of total primary energy supply and consumption, the total primary energy supply in the BIMSTEC region in 2008 was 772 million tonnes of oil equivalent (Mtoe)[9] and is estimated to increase to 1,758 Mtoe in 2030. Over the same time period, total primary energy demand is expected to increase from 539 Mtoe in 2008 to 1210 Mtoe in 2030.[10] Figure 1 lists the primary energy consumption mix of the BIMSTEC member states.

Figure 1: BIMSTEC Energy Mix



Source: Authors' calculations, using data from IEA and IRENA.

The State of Energy Security in BIMSTEC Countries

While biomass comprises a significant share of the primary energy mix, the countries remain highly dependent on fossil fuels such as coal, oil, and/or natural gas.[11] There is variance, to be sure: in Bhutan (36 percent), Myanmar (46 percent) and Nepal (72 percent), the primary source of energy is biomass;[e] meanwhile, Thailand (natural gas and oil), India (coal and oil) and Bangladesh (natural gas) are largely dependent on fossil fuels. Renewables and hydropower are relatively limited in most BIMSTEC countries, but for Bhutan, the latter is important to the mix. Coal continues to remain the primary source of energy supply (36 percent in 2008; projected to be 39 percent in 2030) and oil/oil products account for the largest share of primary energy consumption in the region. However, the share of oil in total primary energy consumption is expected to decline from 33 percent in 2008 to 29 percent by 2030.[f]

Within this context, examining the supply-demand gap of the energy resources provides an understanding of the energy security scenario of the BIMSTEC region (see Figure 2). Increasing economic aspirations fuel the need to ensure a steady energy supply. As Figure 2 shows, the supply-demand gap for electricity in BIMSTEC as a region is expected to increase more than three times by 2030. At the same time, the supply-demand gap for oil resources is expected to improve in 2030, from a deficit in 2015 to a marginal surplus, aided by an increase in the share of fossil fuel imports.

The share of energy imports in the total energy supply indicates that most BIMSTEC nations rely on imports to meet their primary energy needs;[g] according to World Bank data, fossil fuel imports are crucial for the region in fulfilling energy and transportation needs.[12] Figure 3 shows that net imports of energy by the BIMSTEC region has increased by almost 2.5 times between 2005 and 2018 and self-sufficiency has declined from 80 percent in 2005 to 72 percent in 2018.[h] While the energy profile of the BIMSTEC region suggests

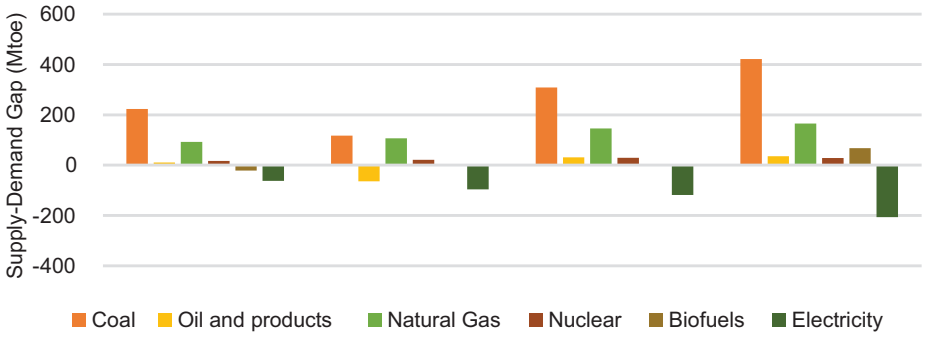
e For more details on the energy mix of the BIMTEC region and forecasts, see Appendix A1.

f Refer to Appendix A1.

g Except for Myanmar, all other BIMSTEC countries are net importers of energy. According to IEA estimates, Bangladesh (17 percent), India (34 percent), Nepal (17 percent), Sri Lanka (50 percent) and Thailand (42 percent) have a significant dependence on imports for their energy needs.

h Self-sufficiency is defined as the ratio of total energy production to total energy supply. The IEA's estimates have been used. These figures represent the average values for India, Bangladesh, Nepal, Myanmar, Thailand and Sri Lanka. Self-sufficiency estimate for Bhutan was not available.

Figure 2: BIMSTEC Primary Energy Supply-Demand Gap

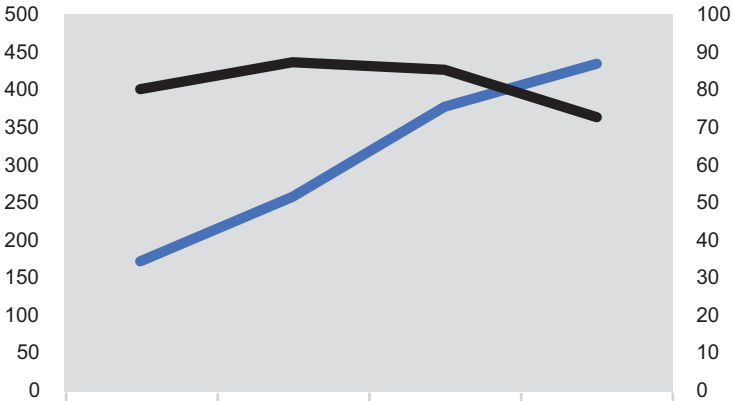


Year	2008	2015	2020	2030
Coal	223.29	117.76	308.72	421.7
Oil and products	10.47	-64.1	30.84	35.86
Natural Gas	92.64	107.02	146.02	165.76
Nuclear	17.12	21.4	29.26	28.54
Biofuels	-21.87	3.67	1.58	67.82
Electricity	-62.35	-96.25	-119	-206.84

Source: Authors' calculations, based on data from BIMSTEC Energy Outlook 2030.

that coal and natural gas will remain important sources of energy, the share of electricity in primary energy consumption is set to increase, even as supply remains inadequate. From 13 percent in 2008, the share of electricity in total primary energy consumption is expected to increase to 19.9 percent in 2030.[13] Increasing CBET will, therefore, be an integral component of cross-border energy cooperation initiatives and the overall energy security policy in the region.

Figure 3: BIMSTEC Energy Imports and Self-Sufficiency



	2005	2010	2015	2018
Net Imports of Energy (Mtoe)-left axis	171.5	257.4	377.4	434.7
Self Sufficiency (%)- right axis	80.2	87.3	85.3	72.7

Source: Authors' calculations, based on data from International Energy Agency.

> "Cross-border electricity trade will be an integral component of the overall energy security policy in the BIMSTEC region."

Energy Cooperation in BIMSTEC

Energy cooperation amongst the BIMSTEC countries has so far relied on bilateral arrangements, with India being the central figure due to its geographical location and high demand for energy. This dates to the 1950s, when the Kosi and Gandak projects began with Nepal and the Jaldhaka project with Bhutan in 1961. More recently, efforts have been made to initiate bilateral energy cooperation between India–Sri Lanka, India–Myanmar, and Nepal–Bangladesh. Most notable amongst these is the MoU between Bangladesh and Nepal on cooperation in the power sector.[14]

Trans-Border Pipeline Interconnections

Most energy cooperation initiatives are through trans-border electricity interconnections. While some oil and gas pipeline interconnections exist, they are at a nascent stage. In September 2019, the petroleum products pipeline constructed and funded by Indian Oil Corporation Ltd., connecting Motihari in India to Amlekhgunj in Nepal, was remotely inaugurated by the prime ministers of India and Nepal.[15,i] On 22 April 2015, an agreement was signed at Dhaka between the Numaligarh Refinery Ltd (NRL) and the Bangladesh Petroleum Corporation for the export of petroleum products to Bangladesh through the proposed 130-km-long Indo-Bangla Friendship Pipeline (IBFPL) from the Siliguri depot of the Numaligarh oil refinery in India to Parbitipur in Bangladesh. Upon completion, 10 million Mtoe will be transported annually through this pipeline.[16] Other pipelines include those that supply gas from the Yadana, Yetagun and Zawtika gas fields in Myanmar to Thailand.

i The pipeline has the capacity to carry two million tonnes of petroleum products annually and gives Nepal access to cost-effective modes of uninterrupted fuel supply. Along with the approval of INR 1,236.13 crore for the transmission component of the Arun-III project by the Indian government in March 2019 to evacuate power from Nepal to India, the operationalisation of the oil pipeline will provide a much-needed fillip to energy cooperation between the two countries.

Cross-Border Electricity Interconnections

Amongst the BBIN countries as well as Myanmar, electricity trade has been the dominant form of energy cooperation that can be exploited to achieve the larger objective of a regional grid. An incremental process can be adopted, whereby electricity grid interconnections are first developed and the positive results used to spur cooperation for developing oil and natural gas regional grids.

Most electricity interconnections are bilateral despite the immense potential of multilateral cooperation to generate larger benefits, e.g. lower power costs, demand diversity and complementarity, and reduced market concentration by a few distributors.[17] In 2018, Nepal and Bangladesh initiated talks on electricity trade, but since the process would require India's participation, there has been little progress.[18] The Dorjilung Hydropower Project (1125 MW)—jointly proposed in 2017 by the Bhutan Electricity Authority, Bangladesh Power Development Board (BPDB) and the Indian Ministry of Power—is another example of an agreement that requires India's participation to allow transmission of electricity from Bhutan to Bangladesh. Under the terms of the MoU signed as part of this agreement, Bhutan will export power produced from this project via India.[19]

Indeed, most of the successful initiatives in energy cooperation so far have been bilateral initiatives: the 1200 MW Puntsangchu-I, the 1020 MW Punatsanghcu II, and the 720 MW Mangdechhu Hydropower Projects between Bhutan and India;[20] and the India–Nepal cross-border transmission interconnection, called the Dhalkebar–Muzaffarpur Line, a 400kV line project (completed in 2016) through which Nepal imports 80 MW of power from India.[21] India–Bangladesh energy cooperation has also made progress in recent years. An MoU was signed between the two countries on the exchange of power through grid connectivity, joint venture investment in power generation, and capacity development of the BPDB.[22] Table 2 gives a list of the existing and proposed cross-border electricity interconnections between India and its neighbouring countries, highlighting how most interconnections are bilateral and focused on the BBIN.

Table 2: Cross-Border Electricity Interconnections with India's Neighbouring Countries

Interconnection Projects	Transmission line type and potential (KV)
India–Nepal (Existing)	
Dhalkebar (Nepal)–Muzaffarpur (Bihar, India): 200 MW	HVAC 400 KV
Kusaha/Duhabi (Nepal)–Kataiya (Bihar, India): 50 MW	HVAC 132 KV
Gandak/Surajpura (Nepal)–Ramnagar (Bihar, India): 50 MW	HVAC 132 KV
Mahendranagar (Nepal)–Tanakpur (Uttarakhand, India)	HVAC 132 KV
Birganj (Nepal)–Raxaul (Bihar, India)	HVAC 33 KV
Jaleshwar (Nepal)–Sitamarhi (Bihar, India)	
Siraha (Nepal)–Jainnagar (Bihar, India)	
Rajbiraj (Nepal)–Kataiya (Bihar, India)	
Biratnagar/Rupri (Nepal)–Kataiya (Bihar, India)	
Nepalganj (Nepal)–Nanpara (UP, India)	
Mahendranagar (Nepal)–Lohia (Uttarakhand, India)	HVAC 11 KV
Baitadi (Nepal)–Pithoragarh (Uttarakhand, India)	
Jaljibe (Nepal)–Dharchula (Uttarakhand, India)	
Pipli (Nepal)–Dharchula (Uttarakhand, India)	
India–Nepal (Ongoing)	
Raxaul–Parwanipur	HVAC 132 KV
Kataiya–Kushaha	HVAC 132 KV

Interconnection Projects	Transmission line type and potential (KV)
India–Bhutan (Existing)	
Chukha (Bhutan)–Birpara (India): 2,500 MW	HVAC 220 KV
Kuruchu: Geylegphug (Bhutan)–Salakati (NER–India): 2500 MW	HVAC 132 KV
Tala (Bhutan)–Siliguri (India): 2500 MW	HVDC 400 KV
India–Bhutan (Ongoing)	
Punatsangchu–Lhamoizingkha–Alipurduar	HVAC 400 KV
Jigmeling–Alipurduar	HVDC 400 KV
India–Bangladesh (Existing)	
Baharampur–Bheramara: 540 MW	HVDC 500 KV
Surjyamaninagar–North Comilla–South Comilla	HVAC 400 KV
India–Bangladesh (Ongoing)	
Katihar–Parbotipur/Barapukuria–Bornagar	765 KV
India–Bangladesh (Proposed)	
Rangia/Rowta–Bangladesh–Muzaffarnagar: 7,000 MW	800 KV
Bongaigaon (Assam)–Purnia (India) via Jamalpur or Barapukuria, dropping 500–1,000 MW Bongaigaon (Assam)–Purnia (India) via Jamalpur or Barapukuria, dropping 500–1,000 MW to Bangladesh	765 KV
India–Myanmar (Existing)	
Moreh (Manipur)–Tamu (Myanmar): 3 MW	HVAC 220 KV

Source: Batra et. al., 2020.

As seen in Table 2, most of the interconnections are bilateral and focused on the BBIN. In particular, the contiguous zone of India's East and Northeast, along with Bangladesh, Nepal and Bhutan,[j] are well poised to facilitate the establishment of a regional electricity market in the BoB region. By embracing multilateral approaches to

j These already have an established energy cooperative architecture.

energy cooperation and with the necessary institutional and physical infrastructure, many of these interconnections can be extended to include a third country. For example, interconnections between Nepal and India on the eastern side of the country can be extended to Bangladesh via Siliguri and other border areas. Similarly, India–Bhutan interconnections can be extended to Bangladesh through the Northeastern states, especially Assam.

BIMSTEC Grid Interconnection

In the context of energy cooperation within BIMSTEC, the 2018 MoU on BIMSTEC Grid Interconnection holds promise.[23] It is expected to facilitate: a) the optimisation of energy resource usage in BIMSTEC; b) the efficient, economic, and secure operation of the required power system, through the development of regional electricity networks; c) the optimisation of capital investment for generation capacity addition across the region; and d) power exchange through cross-border interconnections.[24] In the lead-up to the signing of the MoU, various events were key in establishing the framework for the BIMSTEC: the identification of "energy" as a key area of cooperation during the First BIMSTEC Summit Meeting in Bangkok in 2004;[25] the commencement of the BIMSTEC Grid Interconnection Master Plan Study (BGIMPS) after the BIMSTEC Energy Ministerial Meeting (BEMM) at Bangkok in 2010; and the adoption of the 2011 Memorandum of Association (MoA)[k] for the establishment of the BIMSTEC Energy Centre in Bengaluru, with financial support from India.[26]

The First Meeting of the BIMSTEC Grid Interconnection Coordination Committee (BGICC) was held virtually in Nay Pyi Taw, Myanmar, in June 2021. The meeting deliberated on the function of the members, the mandate mentioned in the MoU for the Establishment of the BIMSTEC Grid Interconnection and Terms

k MoAs are legally binding. While MoUs are agreements between two or more parties that provide details about terms, responsibilities, and requirements about said parties, they are not legally binding. However, MoAs are legally binding and delineate the rights, powers and privileges of the organisation, and also its relationship with its stakeholders. Any activity not mentioned in the MoA cannot be carried out, nor can the organisation exercise any power beyond those mentioned in the MoA.

Of Reference (TOR) of the BGICC, and on the execution of the BGIMPS. The members also discussed the importance of formulating BIMSTEC policies for the transmission of electricity as well as for trade, exchange of electricity and tariff mechanism in accordance with the TOR of the BGICC.[27] In this context, investments are crucial: while the bulk of the financing comes from national governments, financial institutions and multilateral development banks (e.g. World Bank, Asian Development Bank and New Development Bank) are willing to invest more, if the right policies, circumstances and incentives can be ensured.

While dealing with the BIMSTEC Grid Interconnection, India's national policy on CBET assumes importance due to the country's geographic centrality in the region. The first draft of the guidelines on CBET, issued by the Central Electricity Regulation Commission (CERC) in 2016, was opposed by Bhutan and Nepal.[28,l] However, the amended guidelines issued in 2018 have addressed the concerns of the neighbouring countries and allowed the import/export of electricity through a mutual agreement between the trading entities on both sides.

While India's CBET guidelines have to a certain degree incentivised electricity trade in the region, some key elements are yet to be developed. These include establishing a supranational authority to harmonise policies, regulations and legislations. Table 3 gives an overview of the current status of some of the key parameters of CBET.

l The initial guidelines stated that electricity could only be exported to India by companies that were owned by the respective governments of these countries or by those having at least 51-percent equity investment of Indian public or private companies after obtaining a one-time approval from the designated authority.

Table 3: Status of CBET Elements in BBIN Zone

Parameters	Status of BBIN
CBET Provision and Third-Party Transmission Access	Revised CBET guidelines by the CERC in 2018 has facilitated export/import within the BBIN countries and allowed third-party transmission access.
Power-Sector Reforms	
Regulatory Commissions Note: Without this, it is a challenge to establish a platform with power-sector regulators from the BBIN region or create regional guidelines for power trade.	While India, Bhutan and Bangladesh have institutionalised their central electricity commissions, Nepal is still in the process of creating a regulatory body.
Competitive Bidding in Hydropower	**Yes**
Restructuring Note: Helps create competitive wholesale and retail markets in electricity, which might ultimately pave the way towards a competitive regional market.	India has restructured the electricity boards across the states into separate units for generation, transmission and distribution; and Bangladesh and Bhutan have partial restructuring. But initiatives for a Nepal Electricity Board have only been proposed through a draft bill.
Power Trade Protocols	
Bilateral Power-Purchase Agreements (PPAs)	Exists
Competitive Power-Exchange Markets	The IEX, launched in 2008, has allowed Nepal to participate in the DAMs in 2021. This is the first of its kind in the subregion.

Parameters	Status of BBIN
Regional Institution	Yet to be created. This is important for the harmonisation of rules and for dispute settlement.
Cross-Border Transmission	
Interconnections	Bilateral connections already exist.
External Support for Infrastructure	While the governments have been responsible for infrastructure development, ADB and World Bank have also been involved in financing transmission interconnections in the region.

Source: Authors' own, based on Vaidya, Yadav, Rai, Neupane, & Mukherjee, 2019.[29]

In this context, some cases of regional energy pool initiatives are worth mentioning, from which BIMSTEC may draw lessons to strengthen cross-border energy cooperation, particularly in the domain of electricity interconnections. There are various bilateral and regional interconnections across the world, but the scope of this paper covers the regional energy pools such as the Nord Pool, the Southern African Power Pool (SAPP), and the ASEAN Power Grid.

> "In the context of the BIMSTEC Grid Interconnection, India's national policy on CBET assumes importance due to the country's geographic centrality in the region."

The Nordic Pool and the Southern Africa Power Pool

Competitive electricity markets unleash market forces that improve efficiency, stimulate technical innovation, and promote investments.[m] Chile was the first country to attempt to liberalise its electricity market in 1982, followed by England and Wales in 1990. However, the deregulation of the Norwegian power market between 1991 and 1995, which ultimately led to the creation of Nord Pool after Sweden joined in 1996, is perhaps the best example of the creation of a regional energy market, where the gains have largely outweighed the costs.[30] By 2013, the Nord Pool included Finland, Denmark, Estonia, Latvia, and Lithuania, and a few other interconnections with the Netherlands and Germany.[31] In 2014, the North-Western European power markets were integrated with the Nord Pool.[32] Since Norway and Sweden produce much of their electricity from hydropower, while Finland and Denmark rely on thermal power, the integration of the power markets through the Nord Pool resulted in increased economic efficiency, higher security of supply, and improved environmental performance. Market unification further helped optimise the use of Swedish and Norwegian hydropower, resulting in lower electricity prices (average prices) and reduced carbon emissions in the Nordic region and increased security of supply during the dry years through the integration of thermal capacity in Denmark and Finland.

In 1995, the Southern Africa Power Pool (SAPP) was constituted under the aegis of the Southern African Development Council (SADC). The primary objective of the SAPP was to promote energy cooperation between South Africa, Botswana, Mozambique, Zambia, Zimbabwe, Angola, Democratic Republic of Congo, Namibia, Tanzania, Lesotho, Eswatini and Malawi. Prior to this, the southern

m The approach to liberalising the energy markets in one region may not always yield the same results when applied to another region, since each geographic region is unique in terms of its regional political scenario. The purpose of this section is to only highlight how the two energy pools in the world have evolved, and not to prescribe a particular policy or modus operandi for the BIMSTEC Grid Interconnection. The BIMSTEC region has a unique political economy dynamic, elements of which have impeded multilateral energy cooperation as examined in this paper.

(thermal power-rich) and northern (hydropower-rich) networks were linked by weak 220 kV and 132 kV lines, which were integrated after the formation of the SAPP in 1995 by using a 440-kV line. This created a platform to optimise the use of regional energy resources and assist in price discovery. Since 2009, it has evolved from bilateral contracts to Day-Ahead Markets (DAMs).

Both the Nord Pool and SAPP show how an incremental approach can help in the development of regional energy markets. Having agreed to develop a grid interconnection in 2018, BIMSTEC nations can draw lessons from these two cases while extending existing bilateral interconnection infrastructures. This could be the first step towards the development of regional power exchange, similar to the one between Norway and Sweden.

ASEAN Energy Cooperation and Implications for BIMSTEC

The mutual understanding and political wisdom to pursue energy cooperation was the strength behind the ASEAN Energy Cooperation Agreement, signed by the ASEAN member states in Manila, Philippines in 1986.[33] In 1997, the ASEAN members sought to establish interconnecting arrangements for electricity, natural gas, and water within the region while adopting the comprehensive strategic plan of 'ASEAN Vision 2020'. ASEAN planned to promote cooperation in energy efficiency and conservation, as well as develop new and renewable energy resources by creating the ASEAN Power Grid (APG) and the Trans-ASEAN Gas Pipeline (TAPG). The Hanoi Plan of Action (1998) was drawn as an incremental strategy; later, the ASEAN Plan of Action for Energy Cooperation (APAEC)

> "The development of a multilateral electricity grid between Laos PDR, Malaysia, Thailand, and Singapore, was key to ASEAN energy cooperation."

series served as the blueprint for ASEAN's energy cooperation. The APG and the TAPG spearhead the programme and are an important component of energy cooperation with countries outside the ASEAN region as well. Moreover, the development of the APG is important for the BIMSTEC countries, since it will play a crucial role in the region's efforts to be a part of the larger Asia Super Grid, the International Solar Alliance (ISA), and several other multilateral energy cooperation frameworks.

A step towards multilateral energy cooperation in ASEAN has been the development of a multilateral electricity grid between Laos PDR, Malaysia, Thailand, and Singapore (LMTS).[34] This will be the pilot project for ASEAN and serve as a "pathfinder" for future multilateral electricity trading. Another key component of the APAEC is the Trans-ASEAN Gas Pipeline (TAGP) project. To be sure, there have been hurdles: the decline in regional gas production, failure to build pipelines connecting more than two countries, and the growth of the LNG market. However, as of 2017, the TAGP has already built 3,673 km of transboundary pipelines connecting the ASEAN member states and the six gas terminals in Thailand, Singapore, Malaysia and Indonesia. These links allow transmission of gas from Myanmar to Vietnam or Indonesia, and from Singapore's LNG terminal to Thailand.[35] Through Myanmar and Thailand, BIMSTEC countries can access the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline. Akin to how the European Union, for the Nord Pool and the SADC (for the SAPP), provides an institutional structure for cross-border energy trade, the interconnected regional frameworks between BIMSTEC and ASEAN can pave the way to promoting a pan-Asian energy grid.

Issues in Cross-Border Energy Cooperation in BIMSTEC

Multilateral energy projects in the BIMSTEC region have yet to grow. Securitisation and resource nationalism leads to the adoption of individualistic approaches to energy issues, by increasing the sovereignty costs of agreeing to multilateral energy cooperation frameworks.[36] The most fundamental factors that have hindered the progress of multilateral energy cooperation are discussed below.

Dominance of Bilateralism

South Asia relies heavily on bilateralism in many areas, including cross-border energy cooperation in the BoB region. While functional bilateralism may be regarded as an incremental step towards multilateralism, capable of facilitating mutual understanding to strengthen multilateral frameworks, such impact remains limited in South Asia, particularly within the BIMSTEC. Historical legacy has fostered mutual mistrust and suspicion in the region, such that policies of externalisation of bilateral disputes or encouraging external actors' mediation adopted by some South Asian states are often aimed at limiting India's sphere of influence in the subregion. This is in contrast to the phenomenon of "bandwagoning"[n] by forming an alliance with the regional hegemon, in this case, India. Except for Bhutan, no other contiguous BBIN nations (i.e. Nepal and Bangladesh) have followed the strategy of bandwagoning with respect to energy cooperation. Indeed, in recent times China has emerged as the largest investor in the Bangladeshi energy sector.[37,o] It is also making inroads into the energy sector in Nepal[p] through loans worth US$90 million for the development of the Upper Trishuli 1 hydropower project.[38]

n In international relations, bandwagoning refers to a situation in which a state aligns with a stronger regional power. It does so when it conceives that the costs of opposing a stronger regional power far exceeds the benefits (Mearsheimer 2001, p. 162-163).

o According to estimates by the Bangladesh Bank, the total Chinese FDI into Bangladesh in the fiscal year 2019 was US$1159.42 million (US$1.16 billion). Of this, the net inflow of FDI into the power sector was US$ 960.59 Million. In other words, Chinese investments into the Bangladeshi power sector accounts for 82.8 percent of total Chinese FDI into the country (Kibria, 2019).

p According to the Department of Industry, Government of Nepal, the total proposed amount of foreign investment as of fiscal year 2019-20 by China (Mainland) was INR 120,354.79 million (i.e. INR 120 billion). This involved a total of 1,668 projects. During the same period, total investment proposed by India was INR 98,538.31 million (INR 98 Billion) covering 802 projects (Government of Nepal, 2020). China accounts for a significant share of total FDI into Nepal. In recent times, Chinese FDI into Nepal is clustered in energy-based industries (Gautam, 2018).

To assert its regional power and also counter the growing influence of China, India continues to resort to bilateralism. Recent events, however, have shown that India is gradually acknowledging the importance of a regional approach towards energy cooperation. According to a March 2021 statement by Indian Foreign Secretary Harsh Vardhan Shringla, India is working "assiduously to promote the sub-region comprising Bhutan, Bangladesh, Nepal, Myanmar and India as an energy hub."[39, q]

Resource Nationalism

Resource politics hinders both BIMSTEC members and BBIN countries from realising the potential of energy cooperation. Political leaders in Bangladesh, Nepal and India, for example, have often used energy resources to further their electoral agenda, hampering the pace of cross-border energy cooperation. India's refusal to give land access to Bangladesh to import electricity from Nepal and Bhutan through its territory was a reason for the shelving of the Myanmar-Bangladesh-India (MBI) pipeline in 2005. The inherent link between energy and electoral politics in India, Bangladesh, Nepal and Bhutan has created a perception of energy as a political good instead of an economic good,[r] a narrative that overshadows the economic benefits of energy cooperation.[40]

q The Indian Public Sector Undertakings ONGC Videsh Limited and Oil India Limited have invested US$24.26 million in two shallow water blocks (SS04 & SS09) in Bangladesh. At US$1.2 million, India has invested the most in the energy sector in Myanmar as compared to India's investments in this sector in any other South East Asian country. Additionally, India has also offered a US$100-million line of credit for the development of solar power in Sri Lanka.

r Political good, according to Pennock (1966), refers to the attainment of political goals that satisfy human needs, whose fulfilment makes the policy valuable to humans. On the other hand, an economic good refers to a good or service that has a benefit of utility to society and is also scarce in nature, and thus has an opportunity cost. In the context of this paper, energy is perceived as a political good since, by ensuring energy security, the welfare of the people is enhanced and, certain political goals manifested by a favourable electoral outcome is achieved. However, the economic good of energy cooperation, which includes better utilisation of energy resource endowments in different countries and lower production costs, is often not accounted for.

In the context of the MBI, India refused to engage in any meaningful cooperation with the Khaleda Zia-led Bangladesh National Party (2001-06) on the grounds that they had provided shelter to Indian militants from the Northeastern region of India during that period.[41] When Sheikh Hasina became prime minister in 2006, India and Bangladesh entered a phase of cooperative diplomacy. The Bangladesh–India Framework Agreement, signed in 2011, seeks to foster deeper cooperation in trade, investment, water resources, electricity generation, transmission and distribution amongst several other developmental objectives. Overall, however, long-term energy projects between the two countries have made little progress.[42] Moreover, despite renewed attempts at cooperation following PM Sheikh Hasina's re-election, the trilateral MBI pipeline could not be retrieved as the China National Petroleum Corporation had already signed a 30-year hydrocarbons purchase and sale agreement with Myanmar.[43]

Resource nationalism in the region has led to a misinterpretation of the costs and benefits of resources by politicians. For example, when Indian companies signed production-sharing contracts with Dhaka to explore hydrocarbons in the BoB in 2014, the political rhetoric focused on the need to control these energy resources as strategic assets and not on the objective of cooperation and utilisation for ensuring broader objectives of energy security and human development in the region. Another instance is that of West Bengal Chief Minister Mamata Banerjee's opposition to the agreement between the Government of Bangladesh and the Government of India on Teesta river water sharing in 2011 and in 2017.[44]

Domestic Political Concerns

In the BIMSTEC countries in general and in Bangladesh, Nepal and India in particular, political leaders have used energy resources to further their electoral agenda. Political rivalry between the Awami League (AL) and the Bangladesh Nationalist Party (BNP), for instance, has often resulted in the misrepresentation of the country's interests. In the last two decades of AL rule, India–Bangladesh

relations reached new heights; however, the Citizenship Amendment Act (CAA) passed by India in December 2019 has caused tensions in bilateral relations.[45] While it has not strained the bilateral relationship beyond repair, given the complex nature of domestic politics, the opposition led by BNP is likely to use the issue of CAA as political leverage.[s]

Similarly, turbulent domestic politics in Nepal has undermined the prospects of regional energy cooperation. Rivalry and conflict between the biggest political parties—the Communist Party of Nepal-Maoists (CPN-M), the Unified Marxist Leninist (UML), and the Nepali Congress (NC)—had prevented the drafting of a Constitution until 2015. Under the guidelines laid out in the Constitution, Nepal's foreign policy envisions reviewing past treaties and bilateral agreements based on mutual trust and equality. In addition to border issues, a point of contention in India–Nepal relations has been the latter's insistence on amending the 1950 Peace and Friendship Treaty, a bedrock of their bilateral relations.[46] The border issue (on Kalapani) between Nepal and India, which has put a strain on bilateral relations, could be attributed to Nepal's growing internal crisis.[t] With anti-India sentiments running high in the country following the 2015 blockade, it is likely that future cooperation on energy and other matters will face challenges. Furthermore, it has paved the way for increased Chinese influence in Nepal's energy sector.[47] These internal and external factors could prevent domestic politicians in Nepal from engaging in energy cooperation with India.

s This is evident from the statements made by the Secretary-General of the BNP, Mirzha Fakhrul Islam Alamgir, that people in Bangladesh are worried about the CAA and National Register of Citizenship (NRC) exercise in neighbouring Assam. Alamgir criticised the AL-led government for keeping silent on the issue (The Daily Star, 2019). However, it is also true that of late, the two countries have been successful in making positive decisions in relation to the Land Border Agreement, Coastal Shipping Agreement, and various connectivity projects along with transborder electricity transmission projects.

t While India had been engaged in building infrastructure in the disputed region earlier, the timing of the 8 May 2020 announcement by India, of the 80-km long road connecting to the border with China at Lipulekh, may have triggered the issue, especially given the erstwhile Prime Minister K.P. Oli's domestic political situation (Xavier, 2020).

Issues in Cross-Border Energy Cooperation in BIMSTEC

Another factor that can hinder the pace of energy cooperation is the volatile situation between Bangladesh and Myanmar concerning the Rohingyas and the military rule imposed in Myanmar since February 2021. In 2017, a military campaign against Rohingya Muslims in Rakhine led to their mass exodus to Bangladesh, aggravating the already strained relations between the two nations.[48] For India, the Indo-Myanmar border is crucial for stability in the Northeast as it is home to insurgencies and the military takeover poses a risk to Indian interests on those borders. While relations between India and Myanmar are amicable—particularly between the Indian government and the Myanmar Army, Tatmadaw, as evident in the latter handing over to the Indian government 22 insurgents active in Assam in 2020. Thus, while a military junta is unlikely to significantly hurt India's interests, it has the potential to ignite tensions, especially in light of many ethnic armed organisations opposing the military coup[49] and considering the intricate ties between the communities on both sides of the border. For instance, New Delhi's silence on a burning issue in Myanmar will not be perceived favourably by the people of Nagaland, Manipur, Mizoram, and Arunachal Pradesh. These issues could endanger Indian investments worth US$780 million in infrastructure, including its US$6-billion investment in a petroleum refinery near Yangon.[50]

Similarly, Myanmar–Thailand electricity cooperation projects have also been stalled due to political reasons. A study of three power projects in Myanmar where Thai utilities have invested[u] found that political issues were considered the impediments to energy cooperation: study participants cited as a factor the political transition to a post-army regime and a lack of stability in the newly democratic policymaking process.[51] Furthermore, the MoU between the two countries has not been updated since it expired in 2013, preventing further developments in energy cooperation.

u These are the Dawei Coal-Thermal Power Project, the Hutgyi Hydropower Project and the Tasang Hydropower Project.

Environmental and Social Concerns

Subregional energy cooperation is often contingent upon environmental concerns in the areas through which transmission lines pass. Policymakers in India, Bangladesh and Nepal have varied views on the environmental impacts of the trilateral and bilateral projects in the pipeline. For example, while Bangladesh and India consider hydroelectric projects economically and environmentally desirable, Nepal, while acknowledging their economic benefits, highlights the possible negative impacts on the natural environment within their country. These differing perceptions of environmental security are impediments to sub-regional energy cooperation.[v]

If the social and environmental costs are not considered, long-term issues may outweigh the short-term cost competitiveness of hydropower.[52] Most multi-purpose projects lead to an alteration in flow regimes, affecting downstream ecosystem. Over time, the ecosystem structures and functions, and the ecosystem services are adversely affected. These ecosystem services are often not considered in the cost-benefit analyses of these projects.

Environmental security is a factor in India's bilateral engagement with Bhutan, a country with a relatively stable political relationship with India. However, Bhutan's objective and adherence to the concept of gross national happiness has exposed environmental concerns associated with energy cooperation, especially hydropower. The hydro potential of Bhutan seems dwarfed when one considers the feasibility of such projects on grounds of ecological and environmental issues. For instance, the blasting and tunnelling for the Punatsangchhu I and II projects—the two largest dams under construction in Bhutan, envisioned in collaboration with India—have caused widespread environmental disruption to forests and river systems, and have destroyed the habitats of the endangered white-bellied heron and golden mahseer, a rare species of Himalayan carp.[53]

v According to Dipak Gyawali, the former Minister of Water Resources of Nepal, India is interested in not only importing hydroelectricity from Nepal, but also regulating the rivers flowing into India from Nepal. Regulating the flow of rivers has significant benefits in terms of irrigation, flood control and navigation. However, New Delhi is yet to acknowledge these (Huda 2020, p. 173). India has been unwilling to account for external costs and benefits of the projects between the two countries. This has been an impediment to multi-lateral hydroelectric projects involving the two countries.

Similar events are unfolding in Myanmar over two hydropower projects with Thai investments—the Hutgyi and Tasang. Delays in the projects are attributed primarily to the long-term opposition by the Karen tribe, who have been affected by shifts in the political regime. A failure to update the MoU on energy cooperation between Myanmar and Thailand, which can provide the basis for a legal framework, has further exacerbated the situation.[54]

A bone of contention between India and Bangladesh has been the sharing of water from the Teesta. The construction of at least 25 dams in the upper course of the river in Sikkim and West Bengal has resulted in the river running almost dry, increasing the threat of transboundary water conflicts between the neighbouring nations.[55] Similarly, a coal-based power plant built at Rampal in Bangladesh, in collaboration with the National Thermal Power Corporation of India and Bangladesh Power Development Board, has put the ecologically sensitive Sundarbans region at risk.[56]

The social impacts of energy projects also play an important role in cooperation. An example is the discontent[w] over the Baharampur (West Bengal, India)–Bheramara (Bangladesh) electricity transmissions line, in light of shortfalls in the Indian domestic market. This opposition to exporting energy despite local populations suffering from "blackouts" is an obstacle to energy cooperation.[57] Social unrest have also erupted over the land acquisition, rehabilitation and resettlement issues associated with the construction of multipurpose dams in India's Northeastern states. A case is the construction of the Tipaimukh dam on the Barak river in Manipur, which is likely to displace several villages and communities. With different versions of Environmental Impact Assessments (EIAs) providing different estimates[58] and inadequate local representation in the decision-making process, the local communities have increasingly objected to these projects.[59]

w As reported in local newspapers.

Security Challenges in Changing Regional Milieu

Given that most of India's and Bangladesh's oil imports take the maritime route, they are exposed to vulnerabilities in the "choke points," such as the Strait of Hormuz and the Malacca Strait. The blockade of the Suez Canal caused by the vessel MV Ever Given running aground in March 2021 cost the global economy US$6–10 billion per week.[60] Moreover, with a million barrels of oil and about eight percent of the world's Liquefied Natural Gas (LNG) passing through the Suez Canal each day,[61] such a blockade has the potential to expose energy-import dependent countries (most BIMSTEC members) to supply-chain shocks and compromise their energy security.[62]

India receives over 70 percent of its oil supplies via the sea routes of the Indian Ocean,[63] while China also receives 80 percent of its oil imports through the Malacca Strait, the busiest chokepoint in the Indian Ocean; the Arabian Sea; and the BoB.[64] In this context, Bangladesh—dependent upon oil imports from Kuwait, Malaysia, UAE, Thailand, Indonesia, China, India and Saudi Arabia[65]—likely receives most of the imports through maritime routes as well, since over 90 percent of Bangladeshi trade is seaborne.[66] Consequently, any conflict in the Indian Ocean Region increases the vulnerability of the energy security objectives of these countries.

This has been one of the key drivers of Chinese investments, through the Belt and Road Initiative (BRI) projects, in Sri Lanka, Bangladesh and Myanmar. There is a prevailing apprehension that these investments act as security buffers in addition to securing energy access. Additionally, China's loans to various countries for infrastructure projects often lead recipients into a "debt trap,"[67] e.g. the China-backed expansion of the Myanmar Port of Kyaukpyu in the BoB, which is linked to its Yunnan province by pipelines across Myanmar. China has also emerged as a big investor in the energy sectors of Nepal and Bangladesh.[68] In this context, the India–China rivalry in the immediate neighbourhood is an area of concern, especially given the misgivings regarding Chinese investments.

Enhancing Trust and Confidence

It is critical to foster dialogue amongst the stakeholders in the domain of cross-border energy development. It is also imperative to take a consensus-building approach for projects and initiatives to meet the interest of all parties and maximise gains. The failure to establish a successful multilateral energy agreement in the BBIN and BIMSTEC can be attributed to political and economic issues, environmental concerns, and security challenges in the region. The colonial past and the post-colonial nation-building process in South Asia have contributed to many national and regional problems, with historical grievances often defining and driving the interactions between the nations. Moreover, the partitions (1947 and 1971) of the subcontinent have created a fractured psyche in the region. Thus, the notion of "nationalism" in South Asia is reflexive,[69] i.e. the nationalism of one country is articulated against that of another. Long-standing mistrust and animosity have become an integral aspect of the region, and political issues emerge as one of the biggest challenges to cross-border cooperation. India's relationship with the smaller countries in the region and New Delhi's reluctance to engage in multilateral cooperation further exacerbates the situation.

Harmonising Rules and Principles

For the energy sector to attract private investment, harmonisation is critical, i.e. creating certainty regarding transmission line access, revenue flows, and regulatory predictability. This can only be achieved by a regional institute that oversees grid interconnections and an efficient domestic power sector characterised by the unbundling of the electricity boards in the constituent countries. Further, to develop an integrated regional grid, the domestic power markets must be at a similar stage of development.

At present, all BBIN countries are characterised by a single-buyer model, except India, which has multiple buyers and a competitive trading platform. The BPDB is the sole buyer of electricity in Bangladesh. In Bhutan, the government entity is the only designated

buyer of electricity for all power projects. India can share its expertise in this regard and help the neighbouring countries develop their domestic power markets.[70] In a multilateral energy cooperation framework with third-party involvement, it is necessary to follow specific pricing rules and trading requirements. These protocols must be clearly defined to ensure consistency and safeguard the interests of all members of the multilateral framework over narrow national interests.[71,x]

Establishing a Supranational Body for CBET Governance

One of the key requirements for successful CBET is the presence of a supranational authority to harmonise policies, regulations and legislations. This body should work freely through political regime changes in the member countries, and ensure open and non-discriminatory access to the transmission grid to create a competitive electricity market.[72] At present, industry experts in Nepal have argued that India's CBET guidelines, despite amendments, gives India an upper hand in any power trade with Nepal.[73] In April 2021, the NTPC Vidyut Vyapar Nigam (NVVN), the nodal energy for CBET, secured Nepal's participation in the Day-Ahead Markets of the Indian Energy Exchange (IEX).[74]

However, there is no clear indication regarding how this will lead to the creation of a regional grid, since CBET with neighbouring countries remains restricted to medium- and long-term bilateral contracts. Unless such bilateralism creates spillovers that lead to multilateral cooperation, energy cooperation in the region will remain limited.

x For example, in the SIEPAC (Central American Electrical Interconnection System) cross-border exchanges take place through day-ahead financial contracts and real-time market transactions, with prices set at physical trading points.

Linking BIMSTEC with ASEAN Grid Interconnections

The interconnections between the ASEAN member states have important implications for energy cooperation in the overall Asia-Pacific region, including the BoB. First, through Myanmar and Thailand, BIMSTEC countries can access the APG and the TAPG, as well as the grid interconnections amongst the Greater Mekong Subregion (GMS) countries. The 2018 China–Myanmar–Bangladesh Agreement on Trilateral Power Trading is an indication of possible future interconnections between the two subregional groupings.[75] Second, there are prospects for India–ASEAN Energy Cooperation, well documented in the plan of action to implement the ASEAN–India Partnership for Peace, Progress and Shared Prosperity (2016–20).[76] Of the seven priority areas, "energy" is only second to "political and security cooperation." While the discussions so far have focused on renewable energy, there is scope for broader energy market integration if electricity exchange is expanded between India and the ASEAN through the BIMSTEC. Already, Thailand has electricity interconnections with Laos, Cambodia and Malaysia; it has also proposed interconnections with Myanmar.[77,y]

Nurturing India's Northeast as a Link between South and Southeast Asia

India's Northeast is poised to be a regional energy hub and a link between South Asia and Southeast Asia through Myanmar. Various opportunities lie in hydropower cooperation and gas pipelines (both virtual[z] and physical) and the interconnection of existing grids.

y To further strengthen ties between India and ASEAN, the former has revealed its proposal to invest US$6 billion to build a petroleum refinery in Myanmar's Thanlyn region near Yangon in 2021.

z A virtual pipeline is a substitute for a physical pipeline, whereby gas that would typically be conveyed through a conventional gas pipeline is instead transported as LNG to the point of use by sea, road, rail or a via a combination of one or more of these transport modes. The LNG is loaded into cryogenic containers for transportation from its source, which can be an import terminal, distribution hub or liquefaction plant, to the point of use. At the point of use, a regasification station, also referred to as an LNG satellite station—a multi-purpose facility incorporating LNG storage, vaporisation, pressure regulation and control systems—delivers natural gas exactly as if it were from a physical pipeline.

BIMSTEC's Options

Experts argue that most of the participating states from India's Northeast and neighbouring countries stand to gain from CBET, despite the high costs of investment in energy cooperation in the region.[78] The Hydrocarbon Vision 2030 Report for the Northeast projects a natural-gas deficit in the region, and this could be procured from the newly developing energy blocks in Myanmar.[79] Further, India–Myanmar cooperation can buoy ASEAN–India energy cooperation as well as counter China's growing influence in Myanmar and other ASEAN countries through its BRI.

Thus, the BBIN subregion is not only poised to be a hub within BIMSTEC, but it also paves the way for a BIMSTEC–ASEAN energy corridor through the development of an energy hub in India's Northeast, which connects the adjoining regions. To this end, transborder energy cooperation must be adequately emphasised in BIMSTEC and ASEAN nations through their respective grid interconnection and energy cooperation initiatives.

> "The BBIN subregion is poised to become a hub within BIMSTEC; it also paves the way for a BIMSTEC-ASEAN energy corridor through India's Northeast."

Conclusion

Roshan Saha *is Junior Fellow, and* **Anasua Basu Ray Chaudhury** *is Senior Fellow at ORF-Kolkata.*

Access to energy is an imperative for socio-economic development and a key to the UN's 2030 Agenda. With India yet to achieve universal access to affordable, reliable, and sustainable energy, CBET can play an important role, particularly in the states that border the BBIN countries, where households can be connected to the integrated energy grid. Moreover, considering the growing economic aspirations in the BIMSTEC region, electricity supply is projected to fall short of the burgeoning demand. Meeting this gap requires greater coordination amongst the neighbouring nations, which are endowed with diverse energy resources. CBET can also help curb greenhouse gas emissions by facilitating the diversification of the energy mix of these countries.

The BIMSTEC Grid Interconnection has been conceptualised with these objectives in mind. However, since energy is viewed as an integral element of national and economic security, multilateral cooperation so far has been fraught with challenges. To make BIMSTEC a viable institution for transborder multilateral cooperation, it is important to foster not only trust amongst the members but also the political will to facilitate cross-border energy cooperation.

Endnotes

1 World Coal Institute, *Coal: Secure Energy* (United Kingdom: World Coal Institute, 2005), pp.6.

2 Sustainable Development Goal 7," Sustainable Development Knowledge Platform, https://sdgs.un.org/goals/goal7

3 World Bank, Access to electricity (% of population), World Development Indicators, https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=IN-BT-TH-LK-BD

4 Integrated Research and Action for Development, *BIMSTEC Energy Outlook 2030,* December, 2017, https://irade.org/SARI-EI-Report-on-BIMSTEC-Energy-Outlook-2030.pdf

5 Sachs et. al. *The Sustainable Development Goals and Covid-19. Sustainable Development Report 2020* (Cambridge: Cambridge University Press 2020), pp. 40.

6 Prabir De, "Regional integration in Bay of Bengal region in post-covid-19 period," *ARTNeT Working Paper Series*, 204, January 2021.

7 Kabir M.H., Maknun S.S., Jakariya M. (2017) Energy Interdependency in South Asia. In: Bandyopadhyay S., Torre A., Casaca P., Dentinho T. (eds) *Regional Cooperation in South Asia*. Contemporary South Asian Studies (Cham: Springer), https://doi.org/10.1007/978-3-319-56747-1_14

8 Batra *et. al.*, *Prospects of Regional Energy Cooperation and Cross Border Energy Trade in the BIMSTEC Region*, Integrated Research and Action for Development and South Asia Regional Initiative for Energy Integration, February, 2020, pp. 3, https://sari-energy.org/wp-content/uploads/2020/02/BIMSTEC-Background-Paper_February-2020.pdf

9 Integrated Research and Action for Development, *BIMSTEC Energy Outlook 2030,* December, 2017, pp. 54, https://irade.org/SARI-EI-Report-on-BIMSTEC-Energy-Outlook-2030.pdf

10 *BIMSTEC Energy Outlook 2030,* December, pp.93-99

11 Batra *et. al.*, *Prospects of Regional Energy Cooperation and Cross Border Energy Trade in the BIMSTEC Region*,

12 World Bank, "Fuel Imports (% of merchandise exports)", World Development Indicators, https://data.worldbank.org/indicator/TM.VAL.FUEL.ZS.UN?locations=BD-BT-IN-NP-MM-LK-TH

13 *BIMSTEC Energy Outlook 2030,* pp.99,

14 Adopted from the presentation by Rajiv Ratna Panda, Technical Head. SARI/EI, IRADE, at the second meeting of the SAFIR working group meeting on "Regulatory Cooperation to Facilitate Knowledge sharing, addressing Cross cutting Energy/Electricity Regulatory Issues and Capacity Building in South Asia," Dhaka Bangladesh, 2019.

Endnotes

15 Rajeev Kumar, "India-Nepal fuelling their partnership with first cross-border oil pipeline," *The Diplomatist*, January 3, 2020, https://diplomatist.com/2020/01/03/india-nepal-fuellingtheir-partnership-with-1st-cross-border-oil-pipeline/

16 Sahidul Hasan Khokon, "PM Modi, Sheikh Hasina inaugurate India-Bangladesh oil pipeline construction," *India Today*, September 19, 2018, https://www.indiatoday.in/india/story/pm-modi-sheikh-hasina-inaugurate-india-bangladesh-oil-pipeline-construction-1343280-2018-09-19

17 Rajesh K. Mediratta, "Energy Integration: Creating a South Asian regional electricity marketplace," *Power Line*, March 2016, https://www.iexindia.com/Uploads/Articles/05_04_2016Energy%20Integration_Power%20Line%20-%20March%20Issue'16.pdf

18 "Nepal, Bangladesh sign power cooperation deal," *The Kathmandu Post*, August 11, 2018, https://kathmandupost.com/money/2018/08/11/nepal-bangladesh-sign-power-cooperation-deal

19 "Bhutan to supply hydropower to Bangladesh via India," *Outlook India*, July 2, 2017, https://www.outlookindia.com/newsscroll/bhutan-to-supply-hydropower-to-bangladesh-via-india/1090541

20 Amit Ranjan, "India-Bhutan Hydropower Project: Cooperation and Concerns," *ISAS Working Paper* 301, October 17, 2018, https://www.isas.nus.edu.sg/wp-content/uploads/2018/10/Working-Paper-No.-309-India-Bhutan-Hydropower-Projects-2.pdf

21 Reya Ramdev, "Strengthening ties," *PowerLine,* January, 2019, https://powerline.net.in/2019/01/20/strengthening-ties/

22 Rakahari Chatterjee, Anasua Basu Ray Chaudhury and Pratnashree Basu, *India-Bangladesh Connectivity: Possibilities and Challenges,* Observer Research Foundation Special Report, June 2015, pp. 47, https://www.orfonline.org/wp-content/uploads/2015/06/IndiaBangladesh.pdf

23 "Memorandum of Understanding for Establishment of the BIMSTEC Grid Interconnection," Basic Documents, BIMSTEC, https://bimstec.org/?page_id=223

24 "Memorandum of Understanding for establishment of the BIMSTEC Grid Interconnection", Ministry of Power, Government of India,https://powermin.gov.in/en/content/memorandum-understanding-establishment-bimstec-grid-interconnection.

25 "Document: BIMSTEC Summit Declaration, Bangkok, 31 July 2004" *South Asia Economic Journal*, *6* (2005), https://doi.org/10.1177/139156140500600110

26 "Energy Sector," https://bimstec.org/?page_id=268

Endnotes

27 "First Meeting of the BIMSTEC Grid Interconnection Coordination Committee", BIMSTEC Secretariat, https://bimstec.org/?event=first-meeting-of-the-bimstec-grid-interconnection-coordination-committee

28 TsheringDorji, "India amends regulations on cross-border electricity trade," *Kuensel*, December 25, 2018, https://kuenselonline.com/india-amends-regulations-on-cross-border-electricity-trade/

29 R. A. Vaidya *et. al.*, "Electricity trade and cooperation in the BBIN region: lessons from global experience," *International Journal of Water Resources Development,* 2019, pp. 15.

30 Adopted from presentation by Musara Beta titled "Overview of the SAPP' during the MSC Exchange Visit to the USA in February-March 2013, https://usea.org/sites/default/files/event-/SAPP%20Overview.pdf

31 Based on presentation by Hans-ArildBredesen and Wilhelm Soderstrom titled, "Powering ASEAN: Can the Nordic Model Work?" at Jakarta, May 24-26, 2016, http://www.asean-aemi.org/wp-content/uploads/2016/05/AEMI-Forum-PoweringASEAN-May2016-Hans-Wilhelm.pdf

32 Hans-ArildBredesen and Wilhelm Soderstrom titled, "Powering ASEAN: Can the Nordic Model Work?"

33 "Agreement on ASEAN Energy Cooperation," ASEAN Legal Instruments, Accessed at: http://agreement.asean.org/search.html?q=energy

34 YuthanaPraiwan, "Egat eyes power deal with Singapore to offset glut," *Bangkok Post*, November 13, 2020, https://www.bangkokpost.com/business/2018791/egat-eyes-power-deal-with-singapore-to-offset-glut

35 Shi et. al., "Trans-ASEAN gas pipeline and ASEAN gas market integration: Insights from a scenario analysis," *Energy Policy* 132, 2019, 84, https://www.sciencedirect.com/science/article/abs/pii/S0301421519303295

36 Mirza Sadaqat Huda, *Energy Cooperation in South Asia: Utilising Natural Resources for Peace and Sustainable Development*, New York: Routledge, 2020, 20-23..

37 Abu Siddique, "Infrastructure and energy bind Bangladesh to China," *The Third Pole*, May 13, 2019, https://www.thethirdpole.net/2019/05/13/infrastructure-and-energy-bind-bangladesh-to-china/

38 "AIIB approves first investment in Nepal," Asian Infrastructure Investment Bank, June 10, 2019, https://www.aiib.org/en/news-events/news/2019/AIIB-Approves-First-Investment-in-Nepal.html

39 PTI, "India taking lead to promote regional approach to energy needs: Foreign Secretary Shringla," *The Economic Times*, March 10, 2021, https://economictimes.indiatimes.com/news/politics-and-nation/india-taking-lead-to-promote-regional-approach-to-energy-needs-foreign-secretary-shringla/articleshow/81434318.cms?from=mdr

Endnotes

40 Mirza Sadaqat Huda, *Energy Cooperation in South Asia: Utilising Natural Resources for Peace and Sustainable Development*, New York: Routledge, 2020,pp. 73.

41 Mahendra P. Lama, "How India lost a gas pipeline to China," *The Kathmandu Post*, July 14, 2020, https://kathmandupost.com/columns/2020/07/14/how-india-lost-a-gas-pipeline-to-china

42 "Framework Agreement on Cooperation for Development between India and Bangladesh," Ministry of External Affairs, Government of India, September 6, 2011. Accessed at: https://mea.gov.in/bilateral-documents.htm?dtl/5218/Framework+Agreement+on+Cooperation+for+Development+between+India+and+Bangladesh

43 Mahendra P. Lama, "How India lost a gas pipeline to China" https://kathmandupost.com/columns/2020/07/14/how-india-lost-a-gas-pipeline-to-china

44 A.D. Majumdar, "Why Mamata Banerjee is opposed to sharing Teesta water," *Livemint*, April 11. 2017.

45 Pinak Ranjan Chakravarty, "Does India stand to lose Bangladesh's friendship over CAA and NRC?" *The Quint*, December 20, 2019, https://www.thequint.com/voices/opinion/bangladesh-india-relations-nrc-citizenship-amendment-act-fears-illegal-migrants

46 Kamal Dev Bhattarai, "Amid Rising Big Power Tensions, Nepal Seeks a New Foreign Policy," *The Diplomat*, October 19, 2020, https://thediplomat.com/2020/10/amid-rising-big-power-tensions-nepal-seeks-a-new-foreign-policy/

47 Biswal Baral, " India's 'Blockade' has opened the door for China in Nepal," *The Wire*, March 2, 2016, https://thewire.in/diplomacy/indias-blockade-has-opened-the-door-for-china-in-nepal

48 Sreeparna Banerjee, "The Rohingya Crisis and its Impact on Bangladesh-Myanmar Relations," *ORF Issue Brief No. 396*, August 2020, Observer Research Foundations.

49 Mira Patel," A complex history and layered present: What determines India's response to military rule in Myanmar," *The Indian Express*, May 20, 2021, https://indianexpress.com/article/research/a-complex-history-and-layered-present-what-determines-indias-response-to-military-rule-in-myanmar-7321626/

50 Mira Patel," A complex history and layered present: What determines India's response to military rule in Myanmar"

51 Yamaguchi *et. al.,* Cross-border power trade with Myanmar: barriers and their removal from the Thai's perspective," *Int. J. Public Policy*, Vol. 14, Nos. 1/2, 2018.

Endnotes

52 Vaidya et. al., "The role of hydropower in South Asia's energy future," *International Journal of Water Resources Development* 37, 2021, https://www.tandfonline.com/doi/full/10.1080/07900627.2021.1875809.

53 Beth Walker, "Will mega dams turn Bhutan's happiness sour?" *The Guardian*, May 20, 2015, https://www.theguardian.com/sustainable-business/2015/may/20/will-mega-dams-turn-bhutans-happiness-sour

54 Yamaguchi *et. al.,* Cross-border power trade with Myanmar: barriers and their removal from the Thai's perspective"

55 Nilanjan Ghosh, "Hydropower in the Himalayas: the economics that are often ignored," *Observer Research Foundation*, March 29, 2018, https://www.orfonline.org/research/hydropower-in-the-himalayas-the-economics-that-are-often-ignored/

56 Sahana Ghosh, "A cross border coal plant could put Sundarbans at risk," *Mongabay,* August 3, 2018, https://india.mongabay.com/2018/08/a-cross-border-coal-plant-could-put-sundarbans-at-risk/

57 Mirza Sadaqat Huda, "Can robust bilateral cooperation on common rivers between Bangladesh and India enhance multilateral cooperation on water security in South Asia?" *Strategic Analysis* 37, May 9, 2013, https://www.tandfonline.com/doi/abs/10.1080/09700161.2013.782641?journalCode=rsan20

58 Jaya Thakur, "Exploring the Hydropower Potential in India's Northeast," *ORF Issue Brief No. 341*, March 2020, Observer Research Foundation, https://www.orfonline.org/research/exploring-the-hydropower-potential-in-indias-northeast-61853/

59 Pallavi Hazarika, "Dams Do Not Mean Development: The Case of Hydroelectric Projects in North East India," *EPW Engage* 55, February 1, 2020, https://www.epw.in/engage/article/dams-do-not-mean-development-case-hydraulic

60 Mary-Ann Russon, "The Cost of the Suez Blockade," *BBC News*, March 29, 2021, https://www.bbc.com/news/business-56559073

61 Mary-Ann Russon, "The Cost of the Suez Blockade"

62 Anasua Basu Ray Chaudhury and Pratnashree Basu, "Meeting with China in the Bay of Bengal Sea", JOURNAL OF THE INDIAN OCEAN REGION, 2016 http://dx.doi.org/10.1080/19480881.2016.1226751

63 G Parthasarathy, "Ties across the Indian Ocean," *The Tribune*, June 27, 2019, https://www.tribuneindia.com/news/archive/comment/ties-across-the-indian-ocean-793566

Endnotes

64 Julian Weber, "China's expansion in the Indian Ocean calls for European engagement," *MERICS*, October 11, 2019, https://merics.org/en/analysis/chinas-expansion-indian-ocean-calls-european-engagement

65 Ruma Paul, "Unipec, Vitol win tender to supply Bangladesh with fuels in H1 2020," *Reuters*, February 10, 2020, https://www.reuters.com/article/bangladesh-oil-products-imports-idUSL4N2AA35Y

66 "Blue Economy: Development of Sea Resources for Bangladesh," Ministry of Foreign Affairs, Government of Bangladesh, October 31, 2019, https://mofa.gov.bd/site/page/8c5b2a3f-9873-4f27-8761-2737db83c2ec

67 G Parthasarathy, "Ties across the Indian Ocean"

68 Asjadul Kibria, "China top source of FDI in Bangladesh," *The Financial Express*, November 3, 2019, https://thefinancialexpress.com.bd/economy/china-top-source-of-fdi-in-bd-1572769449; Department of Industry, *Industrial Statistics Fiscal Year 2076/77 (2019/20)*, Ministry of Industry, Commerce and Supplies, Government of Nepal, 2020, https://www.doind.gov.np/index.php/publications/industry-statistics

69 Anasua Basu Ray Chaudhury, *SAARC at crossroads: The fate of regional cooperation in South Asia*, New Delhi: Samskriti, 2006, 127.

70 SARI/EI, *Linking South Asia with Burma & Southeast Asia to Advance Cross Border Electricity Trade: A Political Economy Study- Final Report*, July 2018, https://usea.org/publication/linking-south-asia-burma-southeast-asia-advance-cross-border-electricity-trade-political

71 Castalia, *International Experience with Cross-Border Power Trading. Report to the Regional Electricity Regulators' Association (RERA) and the World Bank*, 2009,*https://documents1.worldbank.org/curated/en/843261468006254751/pdf/703710WP0P11140Border0Power0Trading.pdf*

72 R. A. Vaidya *et. al.*, "Electricity trade and cooperation in the BBIN region: lessons from global experience," *International Journal of Water Resources Development*, 2019, https://www.tandfonline.com/doi/full/10.1080/07900627.2019.1566056

73 Deepak Adhikari, "Nepal power export plans in doubt as India reviews options," *Nikkei Asia*, September 20, 2019, https://asia.nikkei.com/Politics/International-relations/Nepal-power-export-plans-in-doubt-as-India-reviews-options

74 Manish Pant, "India moves towards creation of a regional power grid with CBET," *East Mojo*, April 20, 2021, https://www.eastmojo.com/national/2021/04/20/india-moves-towards-creation-of-a-regional-power-grid-with-cbet

Endnotes

75 "Myanmar, China, Bangladesh agree on electric power trading," *Xinhua Net News*, March 9, 2018, http://www.xinhuanet.com/english/2018-03/09/c_137027904.htm

76 "Plan of Action to Implement the ASEAN-India Partnership for Peace, Progress and Shared Prosperity (2016-20)" Ministry of External Affairs, Government of India, https://aistic.gov.in/ASEAN/aistdfAppendix#

77 Jay Cheema, Akshat Razdan and Avinash Das, "Bolstering India-Myanmar energy partnership - a step towards developing Act East Policy," *Economic Times ET World*, March 8, 2021, https://energy.economictimes.indiatimes.com/news/oil-and-gas/bolstering-india-myanmar-energy-partnership-a-step-towards-developing-act-east-policy/81388126

78 Anbhumozhi Venkatachalam, I. Kutani and M.P. Lama, "Energising Connectivity between Northeast India and its Neighbours," Economic and Research Institute for ASEAN and East Asia (ERIA), Jakarta, 2019, https://www.eria.org/publications/energising-connectivity-between-northeast-india-and-its-neighbours/

79 Sanket Sudhir Kulkarni and AmeyaPimpalkhare, "Exploring cooperation between India's Northeaster gas grid and Myanmar," *Observer Research Foundation*, June 7, 2019, https://www.orfonline.org/expert-speak/exploring-cooperation-between-indias-northeastern-gas-grid-and-myanmar-51759/

Images used in this paper are from Getty Images/Busà Photography (cover and page 2) and Getty Images/Otto Stadler (back page).

ORF OBSERVER RESEARCH FOUNDATION

Ideas . Forums . Leadership . Impact

20, Rouse Avenue Institutional Area,
New Delhi - 110 002, INDIA
Ph. : +91-11-35332000. Fax : +91-11-35332005
E-mail: contactus@orfonline.org
Website: www.orfonline.org