

ENERGY & POWER



BIMSTEC Energy Cooperation in Sight

- Looking Deep into Tariff Adjustment
- Chevron's Asset-Cut Plan Bad Signal for Bangladesh
- Energy Tariff Hikes Become Inevitable Due to Flawed Policy Decisions

SPECIAL ISSUE



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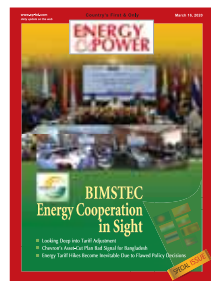
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Asia: US\$ 9, Europe: US\$ 11, North
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There is no technical issue about mining coal from Phulbari, but there are socio-economic issues that would trigger political problems. On the other hand, failure of the government in exploring petroleum resources has made the government to increasingly leaning towards import of Liquefied Natural Gas (LNG). And again, this flawed strategy will let the government continue increasing the fuel price and power tariff. I do not think this...

Individual's opinion does not necessarily reflect editorial policy of Energy & Power



Fortnightly Magazine, Vol 17, Issue 19, March 16-31



E D I T O R I A L

Energy cooperation among the countries in South Asia and the Southeast is pivotal for economic development of the entire region. This is to ensure environmentally friendly and sustainable supply of energy through utilizing the region natural resources. It is not limited only to supplying electricity, but other forms of energy, including gas. The principal idea is that the countries would produce energy from what resources they have and share it with each other. Experts say it would help the countries get energy at an affordable price and benefit their respective economies. The development partners, representatives from member and non-member states are promoting the idea. Experts believe financing is the biggest challenge in materializing the idea. Besides, political unrest of this region and non-cooperation attitude of the member states of BIMSTEC countries have failed to make a common platform to enhance cooperation among the member states of South and Southeast Asian region. They urged the member countries of BIMSTEC to work together to achieve sustainable growth through sharing available energy resources in the South and Southeast Asian region. They said that the countries could solve their energy problem through using the hydro potential of the member countries. Moreover, they emphasized on to sort out the real problems, including the political problems, to achieve desired economic goal.

h i g h l i g h t s



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Bangladesh Energy Regulatory Commission (BERC) announced yet another increase of power tariff on February 27, 2020. This was an outcome of the public hearing conducted by BERC in December 2019 based on the proposals submitted by Bangladesh Power Development Board (BPDB) and its utilities. On a weighted average, the tariff is increased by 5.3 percent at retail level and 4 percent at wholesale level. The tariff increase comes into effect from...

C O V E R



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Experts are now holding talks about extending the energy cooperation beyond the South Asian region (SAARC or BBIN) to Southeast (BIMSTEC member countries) to ensure environmentally friendly and sustainable supply of energy through utilizing the region natural resources. It is not limited only to supplying electricity, but other forms of energy, including gas. The principal idea is that the countries would produce energy from what resources they have and share it with each other. Expectedly, it would help the countries get energy at an affordable price and benefit their respective economies.

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Greenpage

Encouraged by the readers and patrons, the EP would continue bringing out Green Pages to contribute to the country's efforts in its journey towards environment-friendly energy.

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Santos, INPEX Sanction Further Drilling at Van Gogh Offshore Australia

Santos has taken a final investment decision on the Van Gogh Infill Development Phase two project

in the Exmouth basin offshore Western Australia.

The project designed to maximize field production, access additional reserves and reduce production costs, will involve drilling and completing of three new horizontal, dual-lateral production wells and a subsea tieback to existing infrastructure.

Santos expects to produce first oil in late 2021, and has already ordered long lead items such as subsea xmas trees and wellhead systems to ensure an early start-up.

The semisubmersible Valaris MS1 will drill the wells, likely starting the campaign in early 2021.

Santos managing director and CEO Kevin Gallagher pointed out that the commitment comes just over a year since the start-up of Phase one, the value of which was said to have been enhanced by a strong premium to Brent realized for the crude.

The Van Gogh field in the WA-35-L permit is one of three sub-sea oil field developments tied into the FPSO Ningaloo Vision.



Production from the field started in 2010, with Coniston and Novara tied back to the FPSO in 2015 and 2016, respectively.

North Field Expansion Quarters Platform Installed Offshore Qatar

Heerema's heavy-lift vessel Aegir has installed the living

quarters platform offshore Qatar for Qatargas' North Field Bravo expansion project. This was the first major offshore living quarters structure constructed entirely in Qatar.

The Aegir mobilized to Qatar's Ras Laffan Port where the jacket and topsides were constructed by Rosetti Marino at the N-KOM yard.

On Feb. 14, the Aegir picked up the jacket horizontally from the quay side. The 1,000-metric ton structure was then sailed to the offshore site, upended, and positioned in a process that was first tested in Heerema's simulation center.

In the subsequent days the main piles were installed and driven to target penetration. On Feb. 22, the Aegir returned to the N-KOM yard to pick up 3,000-metric ton topsides. The next day, the vessel installed the topsides.

Both mobilizations were completed within 18 hours, according to Heerema.

Gazprom & OMV Continue Negotiations for Siberian Gas Asset

Gazprom and OMV agreed to extend until June 2022 negotiations

related to a 2018 deal regarding assets in Siberia.

On Oct. 3, 2018, Gazprom and OMV signed an agreement whereby OMV would obtain a 24.98% stake in a project to develop Blocks 4A and 5A in the Achimov formations of Urengoykoye field.

As a result, Gazprom's stake would decrease to 50.01%, while Wintershall Dea GmbH would retain its 25.01% share.

Details about the finer points to be negotiated were not disclosed. The deal was originally set to close by the end of 2019.

OMV AG is Gazprom's main partner in Austria. The companies cooperate in gas production, transportation and supplies.



In 2019, Gazprom supplied 14.1 bcm of gas to Austria, it said.

Chevron Partners With UK Decommissioning Center

The National Decommissioning Centre (NDC) and

Chevron Corp. (CVX) have signed an agreement that will support research through to 2023.

The anchor partnership will fund research projects that will aim to better quantify the environmental impacts of decommissioning and provide guidance on best options from an environmental perspective.

The projects will focus on techniques for monitoring fish stocks around installations and pipelines as man-made marine habitats, the bioavailability of potential decommissioning-related substances, and modeling the longevity and eventual fate of offshore infrastructure left in situation.

The projects will be delivered by three PhD students and a post-doctoral researcher under the supervision of biological sciences and engineering academics from the University of Aberdeen.

This is the first anchor partnership between the NDC and an energy major.

An anchor partnership requires a financial investment and a three- to five-year commitment which secures a seat on the NDC Steering Group, on-site office facilities and direct access to the research team and NDC facilities. It provides direct oversight of the research program and the ability to drive the focus of the R&D program. It also offers an additional network opportunity across the OGTC Solution Centre activities to provide oversight on new technology developments, according to the NDC.

Summit Awards Lubricant Oil Supply Contract to Navana

A lube oil supply agreement

ment was signed between Summit Power Limited and Navana Petroleum Limited (An authorized distributor of Chevron Lubricants in Bangladesh) recently. Under this agreement, Navana Petroleum Limited will supply lubricants to 5 power plants (total 630 MW) of Summit Power Limited.

On behalf of the Summit Power Limited Lt Gen (Retd) Engr Abdul Wadud - Managing Director of Summit Power Limited, Engr Md Mozammel Hossain - Managing Director of Summit Gazipur II Power Limited and on behalf of Navana Petroleum Limited Shahedul Islam - Director, Navana Group; Kazi Amirul Hoque Shiblee - Country Director, Navana Petroleum Limited and Maruful Islam Raihan - General Manager, Technology with other high officials were present at the event at Summit Center, Dhaka.



Rooppur NPP: First Set of Steam Generator Vessels to be Ready Shortly

A set of four steam Generator Vessels for unit-1 of Rooppur Nuclear Power

Project is being manufactured at Volgodonsk Branch of AEM-Technology in Russia. The first steam generator will be ready soon for installation of primary circuit header. The other three vessels are on different stages of production- machining, inspection performance.

Steam Generator is a heat exchanger and an integral part of a reactor plant. The 340-ton Steam Generator is about 15 meters in length and more than 4 meters in diameter. One nuclear power unit includes four Steam Generators.

Previously, each vessel was assembled from four shells and welded together. In the welding process, more than 2,000 kg of flux and more than 12,000 meters of wire were used.



AEM- technology is within the structure of Atomenergomash of Russia's state atomic energy corporation- Rosatom.

Nasrul for United Efforts to Take Bangladesh Ahead

State Minister for Power, Energy and

Mineral Resources Nasrul Hamid recently underscored the need for making united efforts by all to take Bangladesh ahead.

"We will take Bangladesh forward with coordinated efforts as journalists support the government for completing development projects quickly," he told the members of Forum for Energy Reporters' of Bangladesh (FERB) when they called on him at his ministry office.

The state minister said scope for organizing trainings and international seminars should be facilitated for energy sector journalists' alongside the government officers, adding, "Investigative reports in the power and mineral resources sector would hasten the process of advancing this vital sector."

Chairman of FERB Arun Karmakar led the 11-member committee, including Vice Chairman Muzerhirul Haque Rumel, Executive Director Shamim Jahangir, Director (Development and Finance) Lutfar Rahman Kakon, Director (Research and Training) Mahfuz Mishu, Director (Data Bank) Shahed Siddiqui, Director (Entertainment and Welfare) Serajul Islam Seraj and executive members Mollah Amzad Hossain, Sadrul Hasan, Shahnaz Begum and Mamun-ur-Rashid.



New Gas Field Discovered in Cumilla

Bangladesh Petroleum Exploration and Production

Company Limited (Bapex) announced discovery of a new gas field in Srikail of Cumilla's Muradnagar upazila recently.

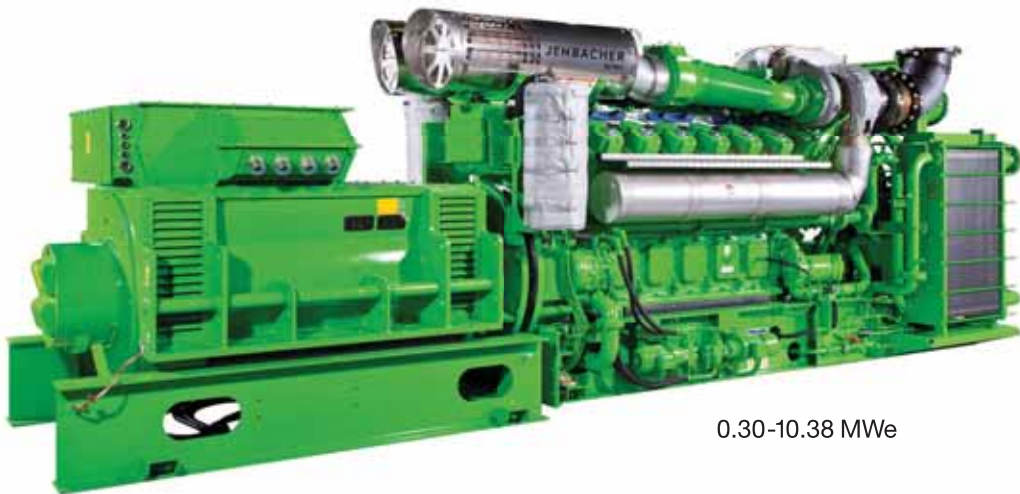
The digging began on October 28 last year at Srikail East-1 gas field, the country's 28th gas field. "After four months, Bapex found a gas layer last night (8pm)," said Mohsinur Rahman, in-charge of the gas field.

Bapex, the state owned gas and oil exploration entity, says it expects to produce 20 million cubic feet per day from the gas field located 3,065 meters below the surface.

Analysis is being done to estimate the gas reserve, water and gas pressure to make the gas field ready for production. The production work will start after a five-day experiment.

There is a process plant near the gas field. A 10km pipeline will be constructed, he said, adding that Bapex is considering the discovery as a light of hope amid news that the country's gas reserve will be exhausted soon.

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Chevron Bangladesh Recognized for Excellence in Stall Design

on February 27–29, jointly organized and sponsored by the American Chamber of Commerce (AmCham), Bangladesh and the United States Embassy Dhaka.

This year, Chevron Bangladesh was one of 48 American companies that showcased their products and services in 80 stalls.

Chevron Bangladesh was proud to sponsor the event banner at the inauguration ceremony, at which Nurul Majid Mahmud Humayun, Industries Minister; JoAnne Wagner, Deputy Chief of Mission of the US Embassy; Md Sirazul Islam, Executive Chairman of Bangladesh Investment Development Authority (BIDA); Syed Ershad Ahmed and Syed Mohammad Kamal, President and Vice-President of AmCham respectively were speakers.

Neil Menzies, Chevron Bangladesh President and Ismail Chowdhury, and Corporate Affairs Director were also in attendance at the opening ceremony, along with key stakeholders from private and public sectors.

Chevron Bangladesh was recognized for “Excellence in Stall Design” at the trade Show.



5,000 Meter Illegal Gas Lines Cut Off In Gazipur

imited, Gazipur regional office disconnected more than 5,000 meter of illegal gas lines from 1,000 residential houses in Kewa area of Gazipur district recently.



Titas gas authority with the help of Gazipur district administration disconnected those lines after conducting a raid led by executive magistrate Harun Or Rashid at the area.

Manager of Titas Gazipur regional office Engineer Ershad Mahmud said a number of people connected gas lines in their residence without any permission of the Titas authority.

Titas Gas Transmission and Distribution Company Limited

Petrobangla Employees Union Executives

was held recently at Petro Centre in the city, says a press release.

Candidates of the Bangladesh Toil, Gas-o-Khanij Sangstha Sramik Karmachari League Federation secured all 30 organisational posts of the executive committee unopposed.

Sheikh Md Saheb Ali and Md Kazim Uddin have been elected president and secretary-general respectively.

The other office bearers are: vice-presidents Md Abdur Rahman, Md Lal Mia, Saiful Islam, Md Abul Khair Sarkar, Md Shah Alam and AKM Kamal Uddin, joint secretaries general Syed Ayez Uddin Ahmed, Murali Singh, Prodip Kumar Sharma, Md Humayun Kabir Swapan, Md Aslam, Murshedul Alam, Md Jakir Hossain and Faruk Ahmed and Md Manjurul Haque organising secretary.



Sheikh Md Saheb Ali



Md. Kazim Uddin

Five Die in Car Cylinder Blast in Gopalganj

Five people have died in a car cylinder explosion after the vehicle crashed into a roadside tree in Gopalganj's Maksudpur Upazila.

The incident took place on the Dhaka-Barishal Highway in Upazila's Dignagar area recently. The crash victims could not be identified immediately.

"A car from Kuakata was heading to Dhaka when the driver lost control and crashed into a tree. The gas cylinder in the car exploded igniting a fire," said Md Ataur Rahman, chief of Bhanga Highway Police Station.





BIMSTEC Energy Cooperation in Sight

Jannatul Ferdushy Sova

Experts are now holding talks about extending the energy cooperation beyond the South Asian region (SAARC or BBIN) to Southeast (BIMSTEC member countries) to ensure environmentally friendly and sustainable supply of energy through utilizing the region natural resources. It is not limited only to supplying electricity, but other forms of energy, including gas. The principal idea is that the countries would produce energy from what resources they have and share it with each other. Expectedly, it would help the countries get energy at



দেশের উন্নয়ন অগ্রযাত্রার গর্বিত অংশীদার-

নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিমিটেড (এনডব্লিউপিজিসিএল)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের মাননীয় প্রধানমন্ত্রী শেখ হাসিনার দূরদর্শী পদক্ষেপে সরকারের বিদ্যুৎ উৎপাদন লক্ষ্যমাত্রা পূরণে এনডব্লিউপিজিসিএল-এর প্রধান নির্বাহী কর্মকর্তা প্রকৌঃ এ. এম. খোরশেদুল আলম-এর সুযোগ্য ও গতিশীল নেতৃত্বে বিদ্যুৎ কেন্দ্র নির্মাণ প্রকল্প গ্রহণ ও বাস্তবায়নে এবং বিদ্যুৎ কেন্দ্র পরিচালন ও সংরক্ষণে অত্র কোম্পানি অনবদ্য ভূমিকা পালন করে আসছে। ফলশ্রুতিতে, 'বিদ্যুৎ ও জ্বালানি সপ্তাহ ২০১৮'-এর উদ্বোধনী অনুষ্ঠানে দ্রুত বিদ্যুৎ উৎপাদন বৃদ্ধির স্বীকৃতি স্বরূপ মাননীয় প্রধানমন্ত্রী এনডব্লিউপিজিসিএল-কে পুরস্কৃত করেন।

নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিঃ দ্রুততম সময়ে শক্তিশালী ব্রান্ড ইমেজসহ দেশের নেতৃত্বশীল বিদ্যুৎ উৎপাদনকারী সংস্থা হিসেবে ইতোমধ্যে পরিচিতি লাভ করেছে।



দ্রুত বিদ্যুৎ উৎপাদন বৃদ্ধির স্বীকৃতি স্বরূপ মাননীয় প্রধানমন্ত্রী শেখ হাসিনার হাত থেকে পুরস্কার গ্রহণ করছেন কোম্পানির প্রধান নির্বাহী কর্মকর্তা

এক নজরে নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিমিটেড

কোম্পানি গঠন : আগস্ট ২৮, ২০০৭

বিদ্যুৎ উৎপাদন শুরু : নভেম্বর ০৩, ২০১২

চলমান বিদ্যুৎ কেন্দ্র সমূহঃ

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- খুলনা ২২৫ মেঃওঃ কন্সট্রাক্ট সাইকেল পাওয়ার প্লান্ট
- ভেড়ামারা ৪১০ মেঃওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র
- সিরাজগঞ্জ ২২৫ মেঃওঃ কন্সট্রাক্ট সাইকেল পাওয়ার প্লান্ট (২য় ইউনিট)
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- সিরাজগঞ্জ ৪১৪ মেঃওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র (৪র্থ ইউনিট) (যৌথ মালিকানা)
- মধুমতি ১০০ মেঃওঃ এইচএফও চালিত বিদ্যুৎ কেন্দ্র

মোট বিদ্যুৎ উৎপাদন ক্ষমতাঃ ১৮১৩ মেঃওঃ

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- রূপসা ৮০০ মেঃওঃ কন্সট্রাক্ট সাইকেল বিদ্যুৎ কেন্দ্র নির্মাণ প্রকল্প
- সিরাজগঞ্জ ৭.৬ মেঃওঃ গ্রিড কানেক্টেড ফটোভোলটায়িক সোলার বিদ্যুৎ কেন্দ্র প্রকল্প
- পায়রা ১৩২০ (২ X ৬৬০) মেঃওঃ তাপ বিদ্যুৎ কেন্দ্র (২য় পর্যায়) (যৌথ মালিকানা)
- পাবনা ৬০ মেঃওঃ গ্রিড কানেক্টেড ফটোভোলটায়িক সোলার বিদ্যুৎ কেন্দ্র প্রকল্প
- পায়রা ৩৬০০ মেঃওঃ এলএনজি টু পাওয়ার প্রকল্প (যৌথ মালিকানা)

চলমান উন্নয়ন প্রকল্পের মোট সক্ষমতাঃ ৭১৮৭.৬ মেঃওঃ

ভবিষ্যৎ প্রকল্পসমূহঃ

- সিরাজগঞ্জ ১০০ মেঃওঃ গ্রিড কানেক্টেড ফটোভোলটায়িক সোলার বিদ্যুৎ কেন্দ্র প্রকল্প (যৌথ মালিকানা)
- পায়রা ৫০ মেঃওঃ বায়ু বিদ্যুৎ কেন্দ্র প্রকল্প (যৌথ মালিকানা)
- দীঘিপারা ১০০০ মেঃওঃ আল্ট্রা সুপার ক্রিটিকাল তাপ বিদ্যুৎকেন্দ্র প্রকল্প (যৌথ মালিকানা)

ভবিষ্যৎ প্রকল্পের মোট সক্ষমতাঃ ১১৫০ মেঃওঃ

এনডব্লিউপিজিসিএল-এর যৌথমালিকানাধীন কোম্পানিসমূহঃ

ক্র. নং	যৌথ মালিকানাধীন কোম্পানির নাম	অংশীদারী প্রতিষ্ঠান	এনডব্লিউপিজিসিএল-এর মালিকানা/শেয়ার
১.	বাংলাদেশ-চায়না পাওয়ার কোম্পানি লিঃ	চায়না ন্যাশনাল মেশিনারি ইমপোর্ট এন্ড এক্সপোর্ট কর্পোরেশন (সিএমসি), চায়না	৫০%
২.	সেয়কর্প নর্থ-ওয়েস্ট পাওয়ার কোম্পানি লিঃ	সেয়কর্প ইউটিলিটিজ (গ্রাঃ) লিঃ, সিঙ্গাপুর	২৯%

২০২৫ সাল নাগাদ এনডব্লিউপিজিসিএল-এর
বিদ্যুৎ উৎপাদন লক্ষ্যমাত্রাঃ ১০,০০০ মেঃওঃ প্রায়



নর্থ-ওয়েস্ট পাওয়ার জেনারেশন কোম্পানি লিঃ

আইএসও ৯০০১:২০১৫, আইএসও ১৪০০১:২০১৫ আইএসও ৪৫০০১:২০১৮ সনদপ্রাপ্ত

(বাংলাদেশ বিদ্যুৎ উন্নয়ন বোর্ডের একটি প্রতিষ্ঠান)

an affordable price and benefit their respective economies. The development partners, representatives from member and non-member states are promoting the idea.

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) secretariat and the United States Agency for International Development (USAID) organized a two-day conference titled "Enhancing Energy Cooperation in the BIMSTEC Region" in Dhaka on February 25-26 to discuss the issue with the energy experts and stakeholders concerned, reaching broadly on a consensus to promote the idea to ensure energy security in the region. BIMSTEC launched the conference seeking effective ways for integrated power management among regional nations through enhanced cooperation. Government officials, diplomats, energy experts from BIMSTEC member States attended the conference and discussed the potentials of their respective sides.

The experts agreed that there would be no technical and financial problems, but they were concerned about the lack

of political will among the leaders. The conference was told that the energy demand of the whole region up to 2040 could be met from within only from renewables or low carbon options if there is a necessary political will. It also pointed out that the political unrest often and again hindered the progress towards that goal. Representatives from India, Nepal, Bhutan, Myanmar, Sri Lanka, Bangladesh and the USAID participated in the conference.

The inaugural ceremony was told that a regional electricity grid will benefit the BIMSTEC member countries financially as well as through narrowing energy access gap and facilitating access to electricity for the marginal communities of the region. The single grid among the nations will also ensure affordability and efficient transmission of electricity. The speakers of the conferences emphasized the need to harmonize the operational, legal and regulatory frameworks of the BIMSTEC countries for implementing an interconnected regional electricity and gas grid.

Addressing the inaugural ceremony as

chief guest, Prime Ministers Energy Affairs Adviser Dr. Tawfiq-e-Elahi Chowdhury pointed out that financing would be the main challenge for establishing the regional electricity grid. "Big investment is needed for transmission. The initiative will be stuck at discussions if we do not get the required investment."

Derrick S. Brown, USAID's mission director to Bangladesh, said the conference will help accelerate the regional energy cooperation and improve the cross-border energy trade in the Bimstec region. "We believe that strengthening energy cooperation among countries can result in increased investment, a robust electricity sector, better financing capability, and significantly improved power sector efficiency."

In his welcome address, BIMSTEC Secretary-General M Shahidul Islam highlighted the 2018 contract among the BIMSTEC member countries for establishment of the BIMSTEC grid interconnection to facilitate electricity trade among the member states by putting in place a region-wide grid and said an expert committee was formed to



Prime Ministers Energy Affairs Adviser Dr. Tawfiq-e-Elahi Chowdhury inaugurates the conference as a chief guest

implement the strategies and steps of the agreement. "The committee will find ways to import and export electricity across BIMSTEC countries rather than doing it bilaterally. They will also work on outlining the gridline and the required laws and regulations," he added.

He said the region is one of the fastest growing economies in the world and it is heavily dependent on energy imports. He added that BIMSTEC wants to promote energy security in the region by promoting power trade and development of clean energy resources such as hydropower and renewable energy.

A working session of the conference focused on the energy demand and supply scenario, and cross-border energy trade in the region – each of the member states is either suffering from surplus electricity or lack of it. It was told that a regional grid would help solve the problem by connecting the countries.

Taking part in the discussion, Dr Tawfiq said the BIMSTEC is working on connecting around 3,000 kilometer-long power grid from Myanmar-Thailand - India. "The proposed grid connectivity among the (BIMSTEC) nations could ensure capacity or load factor utilization through complementing each other on the basis of the member countries' energy demand and supply status," he said. The connectivity will also enhance the efficiency of the energy by reducing the electricity cost for the consumers and ensure uninterrupted quality electricity supply for industrial and commercial sectors maintaining stability in the power sector, he added.

Talking to newsmen on the sidelines, the energy adviser said two of the BIMSTEC members Nepal and Bhutan – have high hydropower potentials, but the countries face with power deficiency during the lean seasons. He said Bangladesh could supply power to the two countries during the time of their need and in exchange import their hydropower during the monsoon. He, however, said fluctuation of Bangladesh's existing power transmission and distribution network currently appeared to be barrier for electricity swapping with other countries but "we

are trying to improve the transmission and distribution network".

BIMSTEC Energy Outlook

Making a power point presentation at the working session on BIMSTEC Energy Outlook for Energy Integration: Overview, Energy Capacity, and Policy Frameworks, Pankaj Batra, project director of South Asia Regional Initiative for Energy Integration, focused on the present situation and potentials of each country. Director (Development Division) of BIMSTEC Secretariat Han Thein Kyaw briefly introduced the present situation of BIMSTEC Energy Cooperating, saying the energy sector was identified as one of the initial areas of cooperation in the region.

Professor of International Relations at Jahangirnagar University and Research Director of Bangladesh Enterprise Institute Shahab Enam Khan said internal market, producers and consumers are now increasingly focusing on research and development in renewables than what we have seen earlier. As a result, we are seeing new cars, electrifying cars, new green industries which play role in shifting consumers behavior strongly. He said that when we look into BIMSTEC and the neighboring region, we see the political uncertainty in terms of policy. The political economy remains as a major challenge. Even if you look at the transmission and distribution to a great extent in five years back it was highly politicized in India, Bangladesh and even in Pakistan, he added.

Mr. Khan said that if we see the power sector master plan of Bangladesh or India, there is a considerable focus investing on renewable energy, but the problem remains on the capacity of those countries. However, the capacity that we had earlier and what we have now has substantially improved. But the particular technological growth or the capacity growth has to be harmonized as the country requirements and the requirements of the consumers.

Energy Capacity

Referring to Pankaj Batra presentation, Director General of Power Cell Mohammad Hossain said the power generation potential of the region would be 1,117

gigawatt (GW), including solar power potential of around 392 GW and hydro power potential of almost 400 GW. On the other hand, the total demand of the region is around 904 GW. However, we can meet our demand if we only harness our renewable resources. So, this is what BIMSTEC can do for all of us, he added.

He said that the region has tremendous seasonal and fuel diversity almost every country has some surplus electricity during their off peak time. For example, in Bangladesh, the peak demand starts in the summer and in winter the demand falls down. On the other hand, in Nepal, India or the other parts of the Himalayan region, they need extra load for heating in winter. "So, if we are able to use this diversity and maximize the potentials, we can ensure energy security, environment safety through regional cooperation. However, BIMSTEC can be the platform in the near future that we are looking for," he added.

Joint Secretary of the Indian Ministry of Power Tanmay Kumar presented some brief statistics about per capita energy consumption of the region and focused on initiatives could be taken to raise the consumption. He said that per capita energy consumption is the pre-requisite of development.

Director of Oil and Gas Planning Department under Ministry of Electricity and Energy (Myanmar) Tin ZawMyint said almost 87 percent of our total consumed energy is used for electricity generation. He, However, informed that their electricity generation is mainly dependent on hydropower. As per the data of 2019, almost 52 percent generation comes from hydro, 47 percent from thermal and rest of the generation comes from other sources.

Senior Divisional Engineer of Ministry of Energy (Nepal) Babu Raj Adhikari described the present status of Nepal energy situation. He said they have huge potential of hydropower, which is around 83,000 megawatt (MW). He informed that harnessing hydropower from the resources is technically and financially viable in Nepal. We have also potentials of solar and wind energy



A side view of the conference

which is around 5,000 MW as a whole. With 7.2 percent GDP growth, the country would require 11,000 MW by 2030 and 29,000 MW by 2040. So, in this context, we had to prepare ourselves in policy aspects, institutional and infrastructure development aspects for further regional connectivity and trading.

Policy Frameworks

Additional Secretary (Technical) of Ministry of Power and Energy (Sri Lanka) Merrille Goonetilleke said Sri Lanka is a small country and has a very short separation from the big India. So, any kind of regional cooperation gate opens only through India. "It is necessary for us to be in line with SDG7 and to produce our required energy in a sustainable way. We also believe policymaking is mediatory in regional integration not only for electricity but also for energy."

Merrille Goonetilleke said we also see that the steppingstone would be bilateral and subsequently moving to trilateral and multilateral. Linking two countries through grids was unimaginable but in last 20 years, it has become

the reality. He added that Sri Lanka will also be benefited through connectivity with other countries and our renewable resources also can be utilized.

BIMSTEC Grid Interconnection & Regional Energy Trade

Moderated by Former Foreign Secretary of Bangladesh Ambassador Farooq Sobhan, Technical Director of SARI/El Vinod Kumar Agarwal made a presentation on 'BIMSTEC Grid Interconnection and Regional Energy Trade' and showed the existing cross-border transmission networks among the countries. He said that within the BIMSTEC, power grid interconnections are currently operational between India-Nepal, India-Bangladesh, India-Bhutan and Myanmar-Thailand. On the other hand, the region needs to focus more on developing trilateral and multilateral grid connectivity. "We have to strengthen the physical infrastructure as well as identify other challenges for pulling up the resources."

Director (Development Department) of BIMSTEC Secretariat Han Thein Kyaw talked about the role of BIMSTEC Grid Interconnection Coordination Commit-

tee (BGICC). The committee was formed to coordinate for the successful implementation of grid interconnections and trade in electricity. At the first meeting of the BIMSTEC Expert Group on Energy, held in Myanmar on 28-29 March 2019 the draft Terms of Reference (TOR) of the BGICC was finalized. Though Han Thein Kyaw informed that some of the countries yet to nominate their representative for the BGICC, he hoped that this year all the countries would arrange a forum of discussion and coordination on activities related to regional energy cooperation within BIMSTEC.

Challenges & Opportunities

Speaking at the session, Chief Engineer of Central Electricity Authority (India) Shri Pardeep Jindal emphasized on measuring the required capacity, which needs to be developed for an effective regional connectivity. "We have to measure what would be our capacity after a certain period of time. On the other hand, how much capacity we should trade from the region also needs to be measured. If we can calculate those issues systematically there is a possibility to have a strong

interconnection.” He informed that the existing interconnection with India is around 6,000 megawatt and it can be easily doubled within next four to five years if all the ongoing planes are implemented.

Deputy Director General of Department of Electric Power Planning in Ministry of Electricity and Energy (Myanmar) said that there is a time deference advantage. Our morning peak time is 5-10 am and evening peak time is 5-9 pm. So, in the off peak time, “we only generate half of our maximum demand.” There are some challenges like technical and financial as well as the framework will be needed if we want to share electricity within the region, he added.

The Role of External Partners in BIMSTEC Energy Cooperation & Way Forward

Moderating the session on ‘The Role of External Partners in BIMSTEC Energy Cooperation and Way Forward’, Regional Program Director (Clean Energy and Environment office) of USAID, India, Michael Satin said BIMSTEC region brings together over 1.6 billion people and a combined GDP of US\$ 3.75 trillion. At least five of the countries in the region have faster rate of growth in the global economy. The present energy trade in this region is mostly on bilateral basis. He, however, said that there is an immense opportunity for that trade to expand and become trilateral, multilateral and regional in true sense.

Initiatives Towards Regional Energy Sustainability

Japanese Ambassador in Dhaka Naoki Ito described the Japanese cooperation in BIMSTEC member countries through JICA. He said Japan is partially working in connectivity. Mostly we are working through bilateral basis. We invested in transportation sector, Infrastructure sector and also in connectivity. JICA is working in Matarbari coal project, which will be an energy hub. It is also developing a deepsea port in Bangladesh. In addition, JICA is working in another regional group among four countries (Bangladesh, Bhutan, India and Nepal) called BBIN, which will

focus on energy connectivity. So, JICA is internally discussing the possibility of energy connectivity and doing some study on it. He said that after completing the study, JICA might be able to suggest technical, financial issues as well as some project findings. He, however, said, they are very much committed to regional infrastructure through the expansion of energy area particularly in regional cooperation.

Role of Technical Assistance & Support Country Director of ADB Bangladesh Manmohan Parkash said ADB is as institution that has been working for many years with the regional cooperation and integration. The big opportunity here is to see how we can use the resources, which are within the region, which we can use it for common purpose and for the shared prosperity. In that case, the role of external partner is very crucial, he said. The external partners can actually bring lot of value addition – they can bring the international best practices and play the role of facilitator. He informed that ADB supported the power trade between Bangladesh and India. There are two projects between India-Bangladesh and both of the projects got ADB’s support.

Conclusion

However, speakers at the concluding session said the political unrest of this region and non-cooperation attitude of the member states of BIMSTEC countries have failed to make a common platform to enhance cooperation among the member states of South and Southeast Asian region. They urged the member countries of BIMSTEC to work together to achieve sustainable growth through sharing available energy resources in the South and Southeast Asian region. They said that the countries could solve their energy problem through using the hydro potential of the member countries. Moreover, they emphasized on to sort out the real problems, including the political problems, to achieve desired economic goal.

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মানসম্পন্ন বিদ্যুৎ নিরবচ্ছিন্নভাবে দেশের সকল মানুষের নিকট পৌঁছে দেয়াই আমাদের অঙ্গীকার

- * গ্রীড উপকেন্দ্র, গ্রীড লাইন ও টাওয়ার জাতীয় সম্পদ, তা রক্ষা করা সকলের দায়িত্ব।
- * গ্রীড উপকেন্দ্র, সঞ্চালন লাইন ও বৈদ্যুতিক টাওয়ারের গুরুত্বপূর্ণ যন্ত্রাংশ চুরি প্রতিরোধে সহায়তা করুন, বিদ্যুৎ বিপর্যয় থেকে দেশকে বাঁচান।
- * উচ্চ ভোল্টেজের বৈদ্যুতিক টাওয়ার ও লাইন হতে নিরাপদ দূরত্ব বজায় রাখুন।
- * বিদ্যুতের গ্রীড লাইন ও টাওয়ার হতে নিরাপদ দূরত্বে স্থাপনা নির্মাণ করুন।
- * বৃক্ষ রোপনে গ্রীড লাইন ও টাওয়ার হতে নিরাপদ দূরত্বে স্থান নির্বাচন করুন।
- * বিদ্যুৎ ব্যবহারে সাশ্রয়ী হোন। আপনি বিদ্যুৎ সাশ্রয় করলে তা অন্য একজন ব্যবহার করতে পারে। এমনকি সাশ্রয়কৃত বিদ্যুৎ গুরুতর অসুস্থ কারও জীবন বাঁচানোর কাজে লাগতে পারে।
- * বিদ্যুৎ অপচয় রোধে সচেতনভাবে ফ্যান, বাতি ও অন্যান্য বৈদ্যুতিক যন্ত্রপাতি ব্যবহার করুন।
- * বিদ্যুৎ সাশ্রয়ী (LED/CFL/T5) বাল্ব ব্যবহার করুন।
- * যথাসম্ভব দিনের আলো ব্যবহার করুন।
- * বিকাল ৫:০০ টা হতে রাত ১১:০০ টা পর্যন্ত সময়ে বিদ্যুতের চাহিদা বেশী থাকে। এ সময় দোকান, শপিংমল, বাসা-বাড়ীতে আলোকসজ্জা হতে বিরত থাকুন।



Regional Energy Cooperation for Accelerating Cross Border Electricity/Energy Trade & Mobilizing Investment in BIMSTEC Region

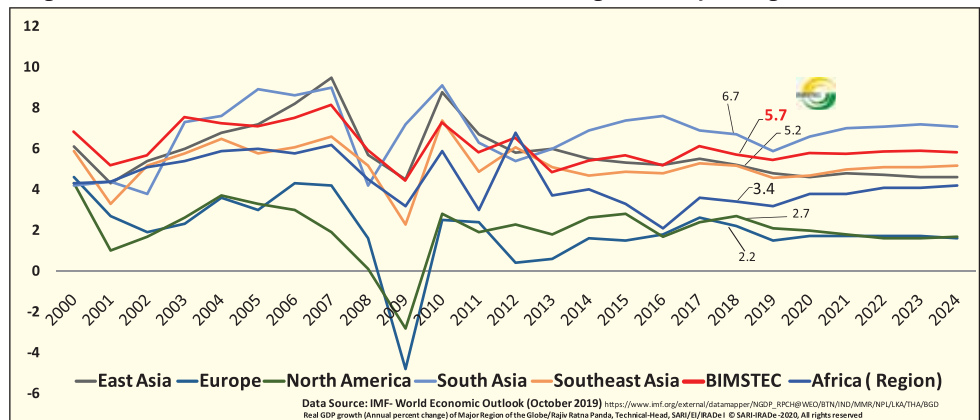
Rajiv Ratna Panda & Maitreyi Karthik

BIMSTEC: The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising seven member states (Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand). The regional group constitutes a bridge between South and South East Asia and represents a reinforcement of relations among these countries.

Economy & Investment

BIMSTEC region is one of the fastest growing with a combined GDP of US\$ 3.75 trillion (2018) and is home to 1.65 billion populations. BIMSTEC region has recorded a robust economic growth over the past twenty years (figure 1) and expected to remain robust in coming years. In 2018, global economy grew at an average of 3.6%. Except Sri Lanka, all other BIMSTEC countries grew faster than the world average. Bangladesh,

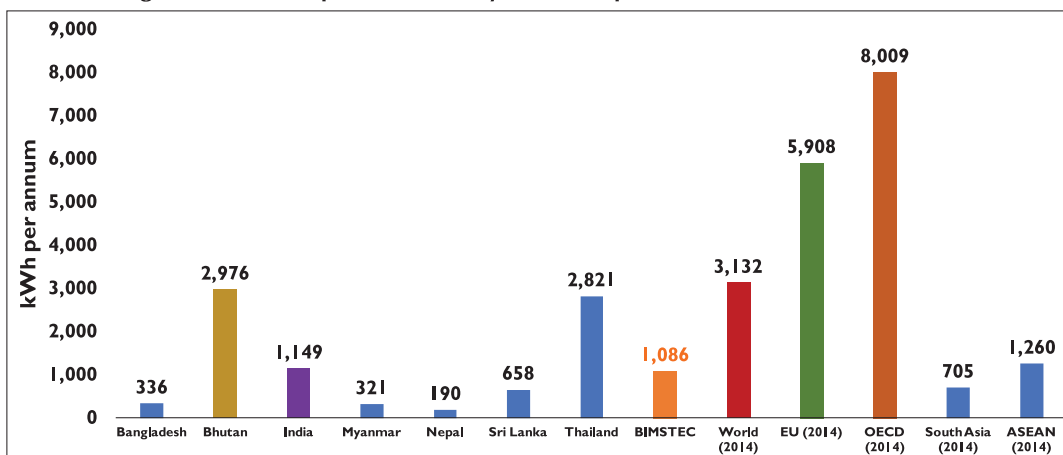
Figure 1: Real GDP Growth (Annual Percent Change) of Major Region of the Globe



Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand reported GDP growth rate of 7.9%, 4.6%, 6.8%, 6.8%, 6.7%, 3.2 and 4.1% respectively as per the world Economic outlook¹. The inflow of investments is considered as a key driver for accelerating the economic growth through employment generation, global capital, global technology transfer, product markets and distribution network. Foreign Direct Investment

(FDI), an important catalyst for economic growth in the developing countries, for the year 2018, region received 61.7 billion USD (only 4.8% of the world FDI). The other regions such as ASEAN, BRICS, SAARC, ECOWAS, EAC, Euro Area received 148.6 billion USD (11% of the world FDI), 261.2 billion USD (20% of the world FDI), 50.7 billion USD (3.9% of the world FDI), 9.4 billion USD (1% of the world FDI), 4.7 billion USD (8% of the world FDI), 163.8 billion USD (13% of the world FDI)².

Figure 2: Per-Capita Electricity Consumption of BIMSTEC Countries



Data Source: Compiled from various sources, World Bank development Indicators database, BIMSTEC countries power/energy ministries/power utilities/regulatory commissions publicly available data sources etc. Countries data is for the year 2018. Per-Capita Electricity Consumption of BIMSTEC Countries/Rajiv Ratna Panda, Technical-Head, SARI/EI/IRADE I © SARI-IRADE-2020, All rights reserved

Energy & Power Sector Scenario

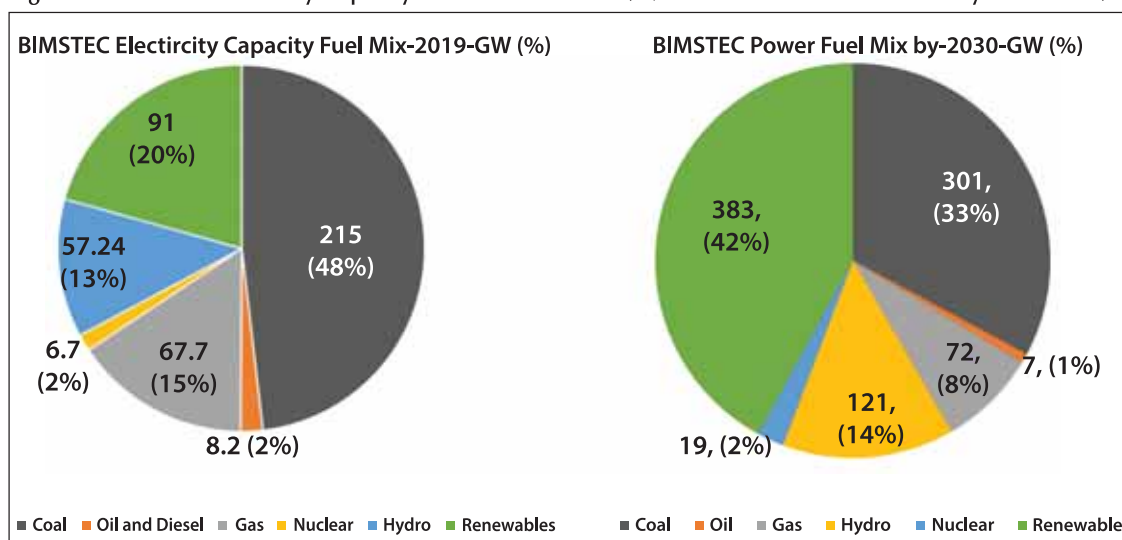
To sustain this high economic growth, the BIMSTEC economies required affordable and competitive supply of energy/electricity on long term basis. Adequate, affordable, clean and sustainable supply of energy is a fundamental pre-requisite for all the development pursuits and endeavors;

from economic development to scientific research, knowledge creation, education, affordable healthcare, quality of life, prosperity, well-being and happiness for the people of BIMSTEC region.

Yet despite this impressive macro-economic growth, the energy sector in the BIMSTEC region has not been able to keep pace, BIMSTEC per capita electric-

ity consumption continues to be low in many BIMSTEC countries and there is a wide variation among BIMSTEC countries (figure 2). BIMSTEC countries' per capita consumption ranges from 190 kwh per person for Nepal to 2,821 kwh per person for Thailand, 2,976 for Bhutan and the region on an average, it is only around 1,086 kwh per person, which is much lower than the world average of 3,132 kWh per person. This demonstrates limited energy supplies even though electricity installed capacity of the region have more than doubled since 2010, grown from 176 GW in 2010 to 447 GW by 2019.

Figure 3: BIMSTEC Electricity Capacity Fuel Mix-2019-GW (%) & BIMSTEC Power Fuel Mix by 2030-GW (%)



Data Source: BIMSTEC Energy Outlook, Electricity Capacity Mix-2019 -GW (%) Compiled from various sources, BIMSTEC countries power/energy ministries/power utilities/ regulatory commissions publicly available data sources etc. Countries data is for the year 2018. BIMSTEC Electricity Capacity Fuel Mix-2019-GW (%) & BIMSTEC Power Fuel Mix by 2030-GW(%) /Rajiv Ratna Panda, Technical-Head, SARI/EI/IRADe I © SARI-IRADe -2020, All rights reserved

Despite the recent focus on renewable energy by BIMSTEC country governments, electricity sector (figure 3) continues to be dominated by fossil fuels. As of 2019, coal constitutes around 48% of the energy mix, renewable energy constitutes around 20%, gas constitutes of 14%, oil & diesel takes up 8.2%. Most of the large BIMSTEC countries imports large amount of its energy needs from outside of the region and are vulnerable to the disruption in global energy supplies. As per, the world energy trilemma index³, (based on Energy Security, Energy Equity, and Environmental Sustainability of Energy Systems), BIMSTEC countries have poor ranks (best rank is 68).

India, Myanmar, Nepal, Sri Lanka and Thailand rank 114, 67, 42, 126, 63 and 76 respectively among 128 countries. As per NITI Aayog report⁵, India's overall energy import dependency is projected to increase to 61% by the year 2047 from 31% in the year 2012 in business as usual scenario.

Energy Resource Potential of BIMSTEC

Fortunately, the region is endowed with abundant natural resources comprising of 323 billion tonnes of coal, 664 million tonnes of oil, 144 trillion cubic feet (TCF) of natural gas, 11,346 million tonnes of biomass and 328 GW of large hydropower and renewable energy of 1,117 GW potential (Table-2). There is huge amount of resource diversity among the countries. The coal resource is mainly concerted in India (319 billion tonnes) followed by Bangladesh (3.3 billion tonnes) and Thailand (1 billion tonnes). Whereas India, Myanmar, Bhutan, Nepal possess 145 GW, 100 GW, 42 GW and 23.8 GW of hydro power potential respectively. Renewable energy potential is dominated by India (1000 GW) followed by Myanmar (60GW) and Thailand (23 GW).

Regional Energy Cooperation (REC) & Cross Border Energy Trade (CBET)

Governments of the BIMSTEC countries have recognized issues and challenges

Table 1: Energy Trilemma Ranks of BIMSTEC Countries

Country	Trilemma Rank (Overall Rank)	Energy security rank	Energy equity rank	Environmental Sustainability rank
Bangladesh	114	114	108	102
Bhutan	NA	NA	NA	NA
India	109	67	104	115
Myanmar	104	42	111	62
Nepal	117	126	107	101
Sri Lanka	85	63	101	44
Thailand	68	76	71	79

Note: Total Number of Countries 128. 1 is the Best Performer & 128 is worst performer.

Source: <https://trilemma.worldenergy.org/>
<https://trilemma.worldenergy.org/reports/main/2019/2019%20Energy%20Trilemma%20Index.pdf>

Bangladesh, India, Myanmar, Nepal, Sri Lanka and Thailand rank⁴ (overall trilemma ranks) 114, 109, 104, 117, 85 and 68 respectively among 128 countries (Table-1). On energy security indicators, Bangladesh,

being faced by the energy/electricity sector and the need to cooperate in energy sector. It is arguable that in the BIMSTEC region, probably energy/electricity cooperation has been most successful among other forms of regional cooperation. It is certainly the case in BIMSTEC region in particular in the BBIN region. CBET has been increasing in a rapid pace in the region. CBET has increased from ~1350 MW in the year 2012 to almost ~ 3563 MW by 2020. Currently CBET between Bhutan- India is ~1800-1900 MW; India – Bangladesh is ~1160 MW, India-Nepal is ~550 MW and India-Myanmar is ~3-5 MW. Despite progress in REC & CBET, the potential remains large. There is approximately 328 GW of hydro power potential existing in the region, which can be only exploited through accelerating cross border electricity trade. The domestic demand of large hydro resource rich countries such as Bhutan (23.8 GW), Nepal (42 GW) and Myanmar (100 GW) are limited, development of these hydro resources will require a regional approach and robust regional energy/power market. Due to lack of a robust regional outlook/approach and limited cooperation, only a small portion of these resources have been utilized. Against the total hydro potential of 328 GW, the BIMSTEC's total installed capacity of hydropower is only 57 GW i.e. only 17% has been exploited so far (figure 4).

The BIMSTEC countries complement

Table 2: BIMSTEC Energy Resource Potential

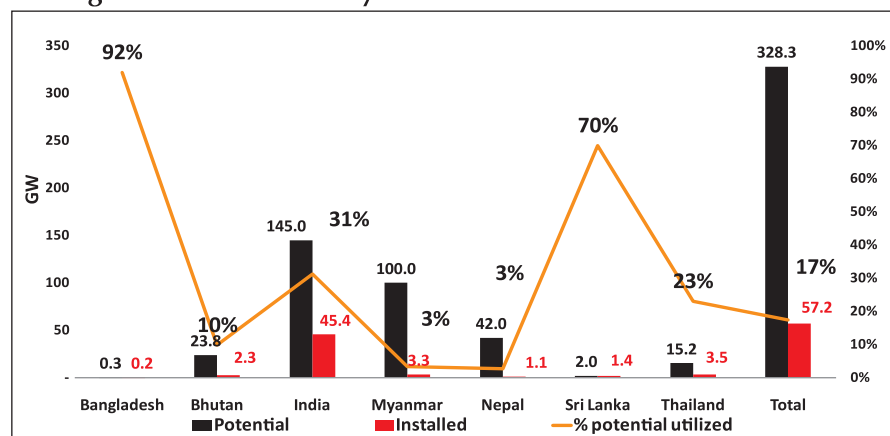
Resources	Coal (Million Tonnes)	Oil (Million Tonnes)	Gas (Trillion Cubic Feet)	Bio-mass [#] (MT)	Hydro (GW)	Renewable *(GW)
Country						
Bangladesh	3,300	-	5.7	218	-	3.67
Bhutan	1	-	-	625	23.8	12.76
India	3,19,020	600	45.5	4,150	145	1000
Myanmar	120	64.3	41.3	3,303	100	60.7
Nepal	<1	-	-	1,056	42	4.829
Sri Lanka	-	-	-	155.5	2	11.6
Thailand	1,063	-	6.6	1,838	15.2	23.0
BIMSTEC Total	3,23,504	664	99	11,346	328	1,117

Data Source: Compiled from various Sources: BP Statistical Review 2019, Sectoral and National Plans of individual countries, IRENA, UN, ADB, Government Statistic Report, Government Portals, European Journal of Sustainable Development Research, Prospects of Regional Energy Cooperation and Cross border Energy Trade in the BIMSTEC region. * Either resource is nil or value less than 0.1; [#] Solar, Wind & Small Hydropower & Forest & Other Wooded Land

each other in the areas of energy resources, load curve, demand and supply scenario. For example, India is abundant in coal reserves (319 MT) whereas countries such as Bhutan (23.8 GW), Myanmar (100 GW) are rich in hydro resource. Myanmar and Bhutan can supplement their additional power requirements through cross border trade links with India and other BIMSTEC countries. The demand-supply seasonal variations exist throughout the day, weekends, weekdays among BIMSTEC countries, demand can be met through energy trade links with countries that are surplus in other alternative resources. Due to the high variation of seasonal demand across the countries, provides opportunities for optimal utilization of resources. Seasonal differences during the monsoon provides sufficient to excess hydro power output,

whereas in lean periods (dry winter season), more thermal power support can be provided. This optimization of energy resources will also lead to affordability of energy/electricity among the citizen of BIMSTEC countries. There is also a difference in time zone (Thailand is 1 hour and 30 minutes ahead of India) between the countries of the region, leads to diversity in the exact time of peak demand among the BIMSTEC member states. This offers the possibility of meeting peak demand with less peak generation capacity coupled with CBET, instead of each country trying to meet peak demand entirely on its own. The difference in the daily load curve provides opportunities for optimizing the load-generation balance across the region. BIMSTEC nations should capitalize on the complementary nature of their resource base and their differential power demand to satisfy their energy needs. With focus on shifting towards renewable energy in most BIMSTEC countries, deepening regional grid integration can help balancing the grid by managing the intermittency of renewable energy. The current power generation mix varies widely among BIMSTEC countries. The hydro rich (Nepal, Bhutan and Myanmar) and gas power rich countries (Bangladesh and Myanmar) can provide balancing power to the BIMSTEC regional grid. Apart from electricity cooperation, there exists a huge potential for other forms of cooperation in oil and gas sector. The governments have already taken steps in

Figure 4: BIMSTEC – Hydro Resource Potential & Utilization



Data Source: Compiled from various Sources; Prospects of Regional Energy Cooperation and Cross border Energy Trade in the BIMSTEC . BIMSTEC –Hydro Resource Potential and utilization /Rajiv Ratna Panda, Technical-Head, SARI/EI/IRADE I © SARI-IRADE -2020, All rights reserved

this direction, various cross border oil and gas pipeline between BIMSTEC countries has been established and are in the process of planning.

Multidimensional benefits of BIMSTEC Regional Power/Electricity Grid

The diversity of endowments in BIMSTEC region as a whole is a great motivator for driving the countries in this region towards cross border energy interconnection. Electricity grid integration and CBET entails multidimensional benefits which have been summarized below and in the figure 5.

A) Economic & Financial benefits– This type of benefit allows for availability of power at competitive price, access to cheaper alternative sources of energy, utilization of surplus power generation of one country in another and accelerated economic growth and development of the region. The cheaper cost of electricity acts as a driver in case of import of power by Nepal from India. In Bangladesh, the cost of power generation in FY19 was 7.00 US cents per kWh. It purchases power from India at cheaper rates; from WBPDC at 3.57 US cents per kWh; from NVVN at 6.08 US cents per kWh and from PTC at 5.62 US cents per kWh. In 2019 Nepal recorded its import power cost from India at 6.08 US cents per kWh which was lower than their overall average power purchase cost of 6.52 US cents per kWh. Hydropower export contributes over 27% of government revenue⁶ & 14% of Bhutan's GDP.

B) Technical & Operational benefits– This includes improved energy security and reliability of respective power systems. Increased power availability, optimized transmission network development, facilitating renewable energy grid integration, improved regional grid balancing and management of peak deficit are some of its other features. For example, Bangladesh imports coal, oil and LNG in order to meet its own energy demand. In FY 2019, the country imported 9.62% of its annual electricity requirement from India.

C) Environmental benefits & addressing climate change–BIMSTEC regional power grid would allow for energy and

Figure 5: Multidimensional Benefits of BIMSTEC Regional Power/Electricity Grid -Potential Benefits

Technical and Operational Benefits	Economic and Financial Benefits:	Environmental Benefits and addressing Climate Change	Energy/Power Market Development
• Optimal Use of Regional Resources and System • Access to wider range of generation resources • Economies of scale in the development of regional resources. • Improved energy security & reliability of respective power systems. • Increased Power Availability • Optimized transmission Network development. • Facilitating Renewable energy grid integration-Sharing of variable generation source • Improved Regional Grid balancing • Reduction in spinning reserves • Management of peak deficit • System reliability, Economic extension of grid.	• Power availability at competitive price • Access to cheaper power sources • High export income (electricity export revenues) • Utilization of surplus generation of one country in another • Cost effective and optimal power system • Better return to investors in generation assets • Improvement in industrial productivity and competitiveness • Less exposure to volatile international energy prices • Accelerating Economic Growth and development • Economic development and prosperity,	• Energy and Climate Security • Reduce environmental Impact • Reduce fossil fuel Imports • Reduce Adverse Impact of Indoor Air Pollution • Improvement in Social Indicators • Achieving Sustainable Development Goals. • Sustainable Development of Energy Resources. • Renewable Energy Development • Mitigation the adverse impacts of Climate change. • Affordable, Reliable, Sustainable and Modern Energy System-Less Carbon Footprint	• Bringing Resource to the market • Commercial and market form of trade. • Development of Domestic and Regional Competitive power market. • Efficient, transparent and competitive price discovery.

Multidimensional Benefits of BIMSTEC Regional Power/Electricity Grid -Potential Benefits /Rajiv Ratna Panda, Technical-Head, SARI/El/IRADe 1 © SARI-IRADe-2020, All rights reserved

climate security, reduce fossil fuel imports, achievement of sustainable development goals, sustainable development of energy resources, mitigating the adverse impacts of climate change amongst others. For instance, “Bangladesh plans to buy 2000 MW solar power from India” as quoted by Dhaka Tribune (18 April 2018). India's import of clean and green hydropower helps in decarbonising the power sector and to reduce emission of India.

D) Energy/power market development– The benefits include in bringing untapped energy resource to the market which otherwise will remain untapped, commercial and market form of trade, development of domestic and regional competitive power market. Bangladesh buys around ~750 MW on commercial/market basis from India.

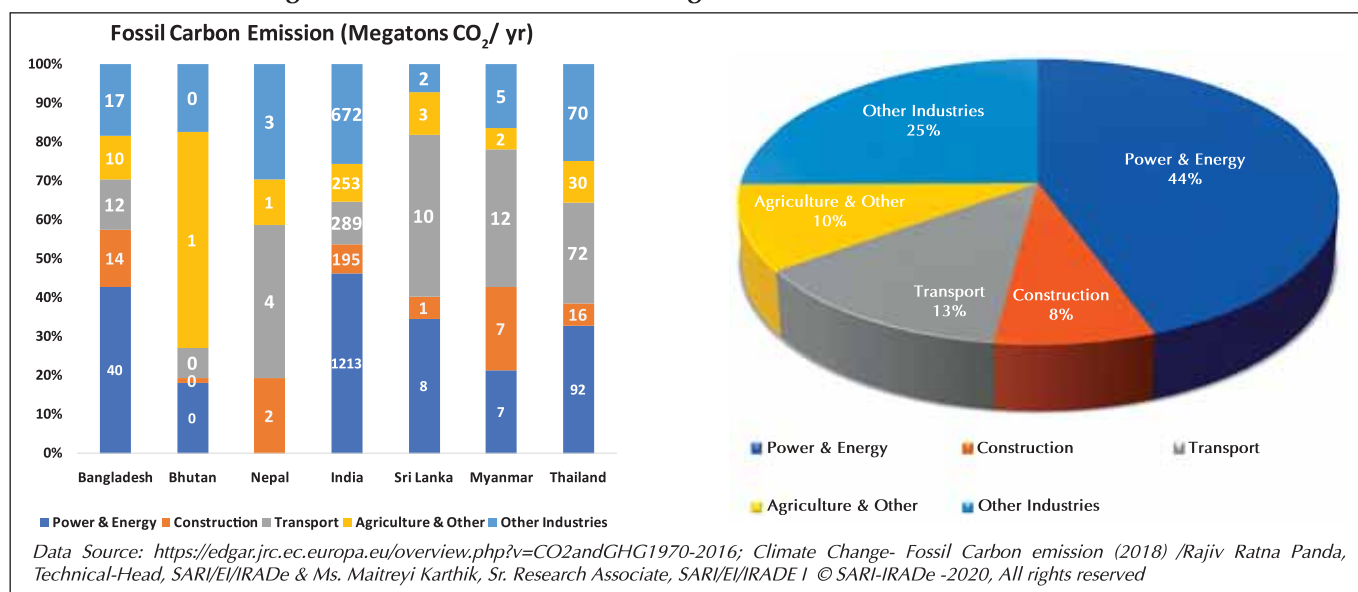
Concurrently, since climate change has emerged as a key global development challenge of the 21st century, policies and programs facilitating regional energy trade and the large-scale adoption and deployment of clean and renewable energy will need to play a central role in BIMSTEC region in meeting climate challenges and, at the same time, fulfilling energy requirements. Dealing with climate change is also important to meet the sustainable development goals. Currently (2018) the CO₂ emission of BIMSTEC countries is about 3064 Megatons of CO₂ per year. Power/energy sector (1360 Megatons

CO₂ per year) and transport sector (398.9 MTCO₂ per year) collectively contributes 57% of total CO₂ emission amongst the BIMSTEC countries (figure 6). Power and energy sector alone contribute to 44% of total CO₂ emission amongst the BIMSTEC countries. Thus, there is a need to focus on decarbonizing the power and transportation sector.

Energy & Power Outlook

As per the BIMSTEC Energy outlook⁷ published by SARI/El/IRADe, the total primary energy supply in the BIMSTEC region is projected to grow at an annualised rate of 3.36 per cent during the period 2015-30, to increase from 1,070 Mtoe to 1,758 Mtoe. The peak electricity demand in the BIMSTEC region grows at an annualised rate of 6.5 per cent during the outlook period, an increase from 175 GW in 2014 to 482 GW in 2030. Almost three-fourths of this demand will come from India and the remaining from the other countries in the region. BIMSTEC's generation capacity is projected to increase threefold, from 293 GW in 2014 to almost 904 GW in 2030. The generation mix in the region would see a shift from predominantly thermal-based capacity to cleaner sources as more renewables get added in the system. Renewable-based capacity addition is expected to grow at an annualized rate of 16.6 per cent, the highest recorded rate during the outlook period, expanding from 38 GW in 2015 to 383 GW in 2030. The share of renewables in the electricity mix will be

Figure 6: BIMSTEC: Climate Change- Fossil Carbon Emission (2018)



the highest, at 42 per cent, up from 12 per cent in 2015. This share is also expected to increase significantly with Government of India and Government of Thailand having revised their renewable energy targets. India has made a sharp upward revision of renewable energy targets, 450 GW⁸ of renewable energy by 2030 (earlier target was 175 GW). The current installed renewables capacity (excluding large hydro) in India is 86 GW (as on Feb, 2020). The Thai government has decided to raise the non-hydro renewable target from 20 percent to 30 percent by 2036⁹(As of April 2018, renewable energy supplied was about 15 % of total power consumption in Thailand.)

On cross border front, many cross-border interconnections are being planned and proposed. In the western side, the import of electricity from Bhutan and Nepal to India and to Bangladesh will be the key drivers for developing the transmission infrastructure. It is projected to have 30 GW of cross border transmission interconnection capacity by 2030-2035 (figure 7).

Power Sector Investment Requirements

BIMSTEC as a region offers significant business opportunities in the electricity sector. The region will require US\$ 1,056 billion investments in the generation sector till 2030 in order to achieve the projected electricity capacity re-

quirement. Renewables, coal and hydropower will attract approximately 93 per cent of the overall investment potential. The investments in renewables will be the highest at US\$ 724 billion, which is approximately 68.6 per cent of the overall investment requirement, followed by coal that will require US\$ 168 billion or 16% of the investment potential. Hydropower will require US\$ 93.3 billion or 9% of the overall investments in the region.

Opportunity for Comprehensive Energy Cooperation in BIMSTEC Region

Globally energy and power system are under rapid transformation with technology improving swiftly. In addition to CBET, BIMSTEC countries should cooperate and focus on other areas of energy sector such as energy efficiency measures, industrial efficiency improvement, LED replacement, promotion of smart grid initiatives, integration of distributed generation, clean coal technologies, energy storage, electric vehicles and large-scale integration of renewable energy to the grid, hydrogen energy, fuel cell, clean coal, energy storage and electric vehicles. Countries like India (in particular) and Thailand are taking significant steps in this direction. Energy cooperation including transfer of new energy technologies among the BIMSTEC countries will help in social and economic development of their people.

While the MoU on BIMSTEC grid interconnection¹⁰ will promote electricity grid integration in the region, there is a need to develop a BIMSTEC-Comprehensive Plan for Energy Cooperation (BIMSTEC-CPEC) to augment all perspective area of energy cooperation (including oil and gas sector) for greater energy interconnectivity and promote regional energy trade.

Issues & Challenges for Accelerating Cross Border Energy Trade

Lack of common set of policy, legal, and regulatory frameworks, political commitments, inadequate transmission system interconnections and lack of regional electricity market creates various risks and challenges (figure 8) for accelerating CBET in BIMSTEC Region. There are various policies, regulatory, financial and commercial risks associated with the cross-border electricity projects. Cross-border project risks in general tend to be high without a comprehensive policy, regulatory framework in place for large scale CBET project development. Cross-border element greatly amplifies the risks due to geopolitical, economic and trade related factors. It is often seen that, even projects that appear to be feasible, rationale, economical in practice struggle to get it financed and built.

For example, **a)** what happens if the domestic policy, regulatory framework

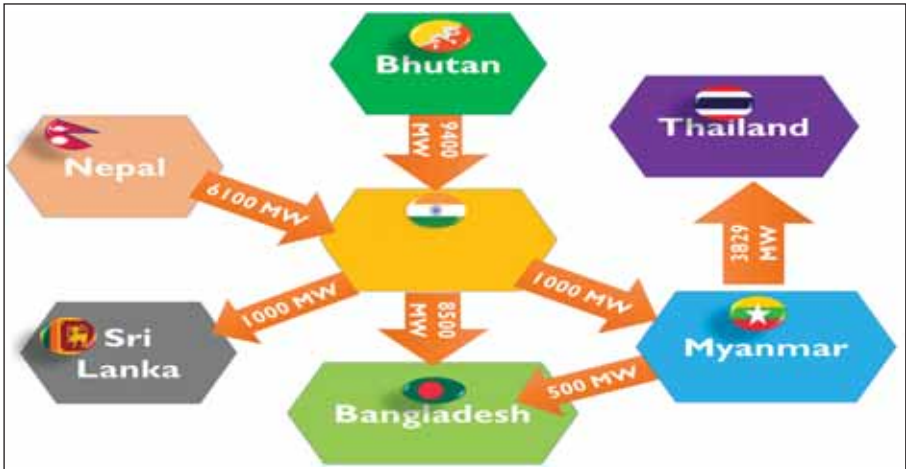
changes which impacts CBET project/Investment? What is the protection available to buyers/sellers/investors? **b)** What happens if the economic assumptions on the project changes? What is the protection available to buyers and sellers? **c)** What happens if the infrastructure to transfer the energy is not built or not in time or is not available when needed? Hence, risk identification and balanced mitigation is important for promoting investment and CBET in the region.

BIMSTEC member states are substantially different in levels of market evolution, varying policy and regulatory frameworks for regulation & institutional framework (figure 9). Most of the countries except India have single buyer model and limited power sector reforms. Except Myanmar, all other countries have electricity regulators in place. Thus, harmonization of grid requires deeper level of coordination and harmonization, institutional mechanism at various levels. While it may be a challenge, it is also an opportunity too to leapfrog, through learning and sharing from each other. Central Electricity Regulatory Commission (CERC), India has issued, Cross Border Trade of Electricity Regulations, 2019, a first of its kind dedicated regulations on CBET in the region. It comprehensively addresses various aspects of CBET and provides clarity, transparency, consistency and predictability in regulatory mechanism. This can be a learning process & starting point of reference towards development of Regional Regulatory Framework for CBET in the BIMSTEC Region. There is also a need to further improve ease of doing business in the BIMSTEC region (regional average rank is 99), 5th among 11 regions.

Emerging Trends (ETs) in Cross Border Energy Trade in the BIMSTEC Region

There are three key emerging trends in the region which are impacting or will impact CBET significantly. ETs-1: Currently most of the CBET are bilateral in nature. India's Guidelines for Import/Export (Cross Border) of Electricity-2018¹¹ opens up the trilateral trade. Bangladesh plans to import power from Bhutan and Nepal through India (from Bhutan, 500

Figure 7: BIMSTEC -Cross Border Electricity Interconnection Capacities (2030-35)



Data Source: Compiled from various Sources: i) Bhutan, Nepal based on 2027 projections in India's National Electricity Plan, Bangladesh-India/Bhutan/Nepal as per PSMP 2016, ii) Sri Lanka based on estimates of Central Electricity Authority, for 2034, Myanmar - Bangladesh as per Bangladesh Revisiting PSMP 2016, Myanmar-Thailand based on estimates of EGAT, India-Myanmar-Author's estimation. BIMSTEC -Cross Border Electricity Interconnection capacities (2030-35)/Rajiv Ratna Panda, Technical-Head, SARI/ET/IRADE 1 © SARI-IRADE - 2020, All rights reserved

MW by 2032, 500 MW by 2034 (Bongaigaon/Rangia -Jampur); (from Nepal, 500 MW by 2031, 500 MW by 2035 and 500 MW by 2038). Recently Bangladesh finalized the deal with Upper Karnali project (being developed by GMR) in Nepal to import 500 MW of electricity from Nepal @ 7.72 cents per unit for a period of 25 years¹². The modalities of transmission and wheeling of power through Indian transmission network is under discussion and finalization. ETs-2: As mentioned earlier, region is facing significant climate change challenges and countries are stepping up their renewable energy targets. In this context, the role of cross-border hydro in renewable energy grid Integration and regional grid balancing becomes extremely important. The five-year vision document for power sector of India¹³ recommends introducing products in balancing market for trading of balancing services from fast response plants such as Hydro to enhance cross border trade through market products. It also recommends, introducing financial products (futures and derivatives) to enhance CBET. Therefore, the role of cross-border trade in regional grid balancing is going to increase in the near future. There are already established global models in similar regional grid balancing for RE integration, such as in the case of Denmark and Norway, where Norway's hydro power plants are utilized to balance Denmark's wind power capacity. Similar models in BIM-

STEC are expected to become a key driver of regional energy cooperation. ETs-3: CBET has increased in BIMSTEC region from ~1350 MW in the year 2012 to almost ~ 3563 MW by 2020. The major share of CBET has only been enabled between the four countries i.e. Bangladesh, Bhutan, India and Nepal (BBIN) and has been initiated primarily through Power Purchase Agreements (PPAs) signed as part of special MOUs (Memorandum of Understanding) between the various governments. More interestingly it is now moving towards commercial from of trade and hopefully soon will see trade through power exchanges. Out of 3500 MW of CBET, ~1100 MW is being traded on commercial and market basis. India's Guidelines for Import/Export (Cross Border) of Electricity-2018¹⁴ allows, cross-border power trade through Indian power exchanges. Going in future more and more CBET is expected to happen through commercial and market basis and through power exchanges platform of India.

Way forward & Recommendations for Accelerating Cross Border Electricity Trade and Mobilizing Investment in Energy Infrastructure Projects in BIMSTEC Region

We suggest a following 10-point concrete formula:

1. Harmonised Policy, Legal, & Regulatory Framework

The development of cross-border

physical transmission infrastructure and its complementary regulatory, policy, pricing, and market mechanisms are yet to evolve fully in the BIMSTEC regional context. It is desirable that each participating country needs to adopt complementary relevant policies, with interconnection being an integral element. Without a consistent and coherent regional regulatory framework in place, investment opportunities and consequently large-scale CBET that could benefit both importing and exporting in nations may not happen. In the BIMSTEC countries' regional context, the risks associated with forging an intra-regional, CBET project would be greatly minimised if each participating country adopts complementary regulatory frameworks to facilitate cross-border interconnection and electricity trade. Therefore, there is a need to develop harmonised Policy, Legal, and Regulatory Framework, which will create the enabling systemic conditions for a sustainable market for investment for CBET by minimising the risks associated. While the, BIMSTEC MoU for establishment of the BIMSTEC grid interconnection has been signed, it is important to provide actionability to the various articles of MoU.

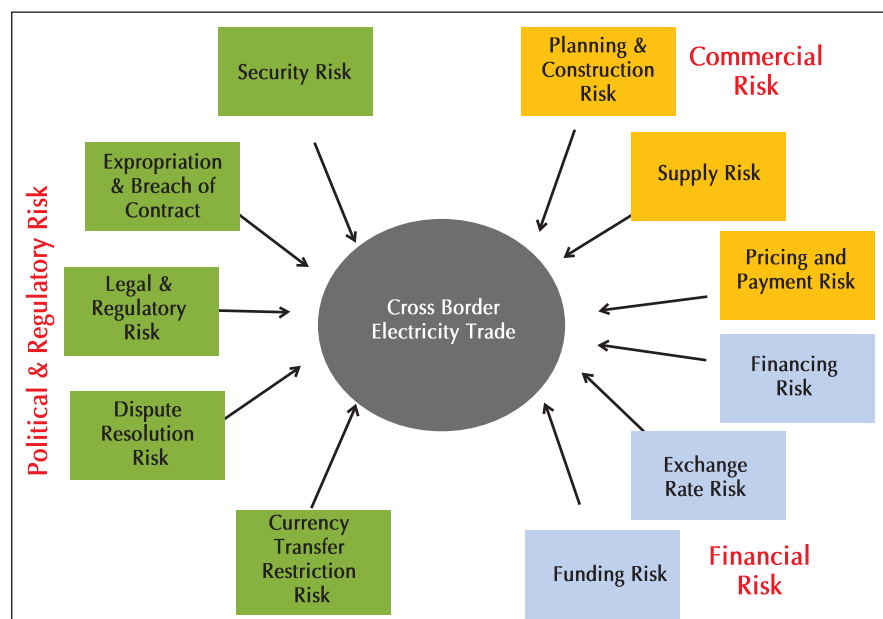
2. Regulatory Instrument for Fair, Transparent & Sustainable CBET

It is important that BIMSTEC member countries put in place various regulatory requirement for fair, transparent and sustainable CBET such as licensing provision for CBET; Open Access (OA) to transmission system; transmission pricing mechanism for cross border trade; regional transmission planning; imbalance settlement, scheduling & dispatch, congestion management framework; energy accounting and settlement procedures; harmonization of grid codes, dispute resolution: (transparent and fair legal framework).

3. Development of a Robust BIMSTEC Regional Power Grid (BRPG)

A strong, physically interconnected grid of BIMSTEC countries (both through HVDC and HVAC) will establish the BIMSTEC power grid, which is essential to reap the potential benefits of regional energy cooperation and CBET in the Re-

Figure 8: Typical Risks in Cross-Border Energy Infrastructure Projects in the BIMSTEC Region



Data Source: Compiled from SARI-EI-Task Force-1 Study on "Study 1: Review and analysis of electricity laws, Regulations, Policies and Legal Structure": Typical Risks in Cross-Border Energy Infrastructure Projects in the BIMSTEC Region/Rajiv Ratna Panda, Technical-Head, SARI/EI/IRADE I © SARI-IRADE-2020, All rights reserved

gion. A BIMSTEC Transmission Interconnection Master plan (BGIMP) will be of immense help towards the creation of BRPG. While countries will benefit from such grid, it is important to develop mechanisms/principles to fully recover the costs and share benefits equitably, resulting from the reductions in investments on generation, transmission systems and fuel cost. Such sharing of benefits builds trusts and confidence among parties in the BIMSTEC regional power generation & transmission interconnections projects. BRPG will be immense social value to the region. Cross-border interconnection of regional/national electricity systems through BRPG will allow the BIMSTEC countries to enhance its security of supply and to integrate more renewables into energy markets.

4. Moving from Bilateral to Trilateral and Multilateral Power Trade (TMPT) in BIMSTEC Region

BIMSTEC countries have been successful in regional energy cooperation and cross border power trade through bilateral forms of cooperation between any two countries. Due to the immense diversity that exist among BIMSTEC nations, trilateral and multilateral power trade have the potential to accrue more

benefits in terms of higher trade volumes, lower installed capacity and optimisation of investment cost, lesser reserve capacity due to sharing of reserve, reduced CO₂ emission and overall regional cost optimisation & economies of scale. There is a need to put in place concrete measures and a detailed roadmap for transition to TMPT.

5. Regional Energy Market Development- BIMSTEC Regional Market for Electricity (BRME)

While recognising the fact that, most of BIMSTEC countries are at early stage of market reform, it is important to have a concrete vision of regional power/energy market. For long-term sustainability, there is need for a transparent and reliable regional competitive power market, as well as preferably domestic markets in each BIMSTEC country. A vibrant regional competitive BRME will make the BIMSTEC power sector competitive, increase cross border trade and streamline investments, making it lucrative for investors who seek fair, steady, and risk-mitigated short- and long-term returns on their capital. Currently (2018) only 13 billion units of electricity is traded in the BIMSTEC region. In 2018, Europe, the traded volume of electricity in the market exceeded 12000 billion units.

6. Institutionalizing the Process of CBET in BIMSTEC Region

International experiences have shown that regional governing as well as enabling institutions play a strong role in enabling energy integration. For example, in South Africa Power Pool (SAPP), the Regional Electricity Regulators Association of Southern Africa (RERA) facilitate synchronization of regulatory policies, legislation, standards and practices and is the platform for effective co-operation among energy regulators within the region. Similarly, in European power market, there is European network of transmission system operators for electricity (ENTSO-E) to develop rules and coordinate grid operations and Agency for Cooperation of Energy Regulators (ACER) for coordination in regulations and legislations. While BGICC will be responsible for development of BIMSTEC transmission master plan, there is a need to create forums for discussion and deliberation at various levels to help/facilitate in coordination of regulations; transmission planning; system operations and market operations etc. Such forums could be developed in BIMSTEC region such as a) BIMSTEC Energy/Electricity Regulators Forum (BERF) b) BIMSTEC Power System Operators Forum (BPSOF) & C) BIMSTEC Energy Markets Forum (BEMF).

7. Innovative Financing Mechanisms & Public Private Partnership

Power and energy projects being capital intensive, arranging cheaper source of funding, innovative financing and financial closure of the projects are always a challenge. Often such investments are Long term, irreversible in nature. Looking at the scale of investment (1,056 billion investments in the generation sector only by 2030) it is important to focus on innovative financing instruments/mechanism and public private partnership in CBET projects. BIMSTEC Countries can promote and facilitate for a) accessing Green funding options (e.g. green bonds, Green Climate Fund, clean energy tech funds) b) blend financing to improve project financial viability c) develop comprehensive financing ecosystem (exchange, platform, broker, market-makers, advisor, equity research etc.) d) work towards integration of capital market of BIMSTEC countries and e) prioritizing of cross border power projects (especially clean energy project) and economic incentives for investment in these. A BIMSTEC Energy Integration Fund (BEIF) may be created to finance regional energy integration projects in the Region. This can be created with the help and support of MDBs such as World bank, ADB and other DFI such as U.S. International Development

Finance Corporation (DFC) and private sector. Regional energy projects will benefit from access to low cost finance from such fund and other development partners.

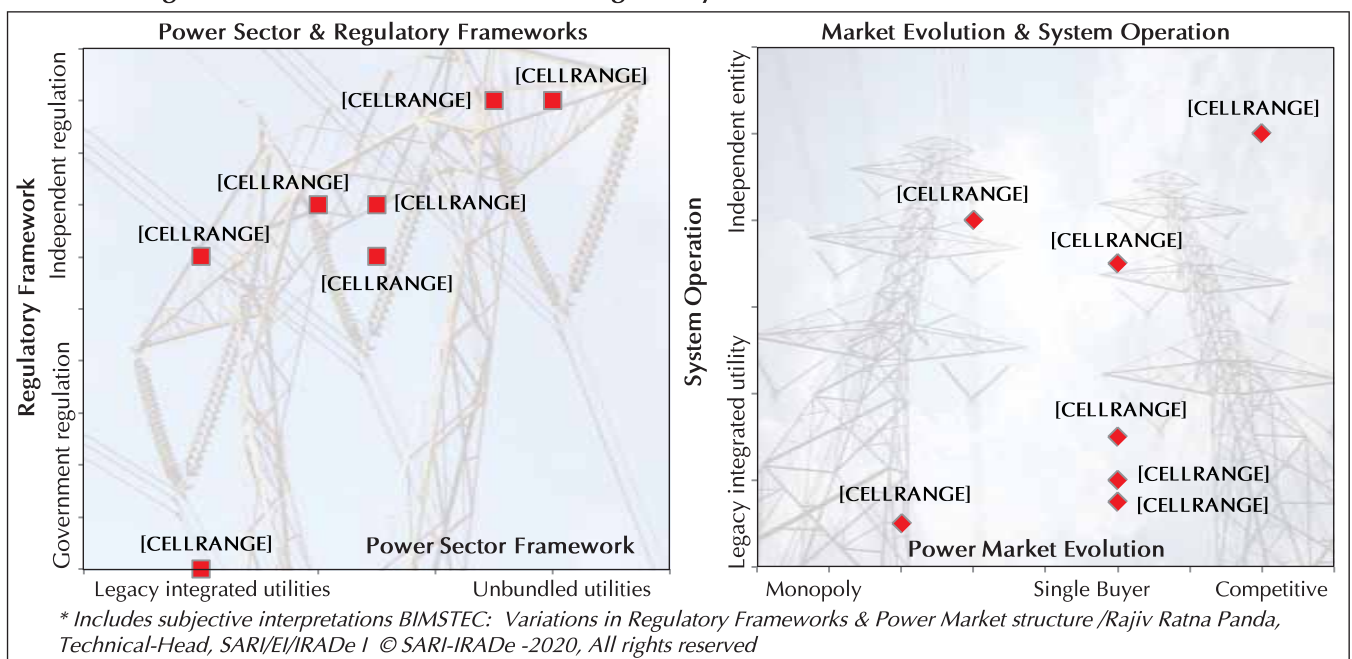
8. BIMSTEC Energy Investment Facilitation Forum (BEIFF)

For mobilising investment and addressing various issues & overcoming challenges, technical assistance and support and dedicated facilitation is required for development of regional energy projects, not just for financing, but also for risk mitigation. The BEIFF will act as a platform for promoting investments in cross-border energy infrastructure and addressing cross-cutting investment and financing issues among financial and investment community and other stakeholders. It will also suggest innovative policy, fiscal and market instruments required/needed to mobilize investments including specific financial/fiscal instruments for BIMSTEC energy sector. The forums should also help in capacity building and sharing success stories and international best practices.

9. BIMSTEC-Comprehensive Plan for Energy Cooperation (BIMSTEC-CPEC)

Energy sector in modern days are far more integrated than it is used to be in future. Integrated approach will help in deriving the best optimal outcome of the

Figure 9: BIMSTEC: Variations* in Regulatory Frameworks & Power Market Structure



REC in BIMSTEC countries. Therefore, there is a need to develop a BIMSTEC-Comprehensive Plan for Energy Cooperation (BIMSTEC-CPEC) to augment all perspective area of energy cooperation (including oil and gas sector) for greater energy interconnectivity, integration and promoting long term regional energy trade. The same is also echoed by the leaders of BIMSTEC countries during the 4th BIMSTEC Summit. BIMSTEC-CPEC should also provide a long-term road map and concrete action plan for implementation.

10. Sustainability of Energy Infrastructure Project Development

While there is large potential of energy resources in the region, it is important to develop these resources in a sustainable and environment friendly manner with limited environment degradation. People's participation in the energy infrastructure development and sharing benefits with all project stakeholders and affected parties are important. This will not only help in development of energy Infrastructure robust but also will help in meeting sustainable development goals and benefits to the citizens of BIMSTEC countries.

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Report

Mega Offshore Projects Needed to Safeguard Indonesian LNG Supply

Gas production from fields in Indonesia supplying LNG plants looks set to decline through 2030, according to analyst GlobalData.

However, gas supply may also pick up from 2026 if two planned mega-natural gas and LNG projects – Gendalo-Gehem and Abadi – go forward.

According to Cao Chai, oil and gas analyst at GlobalData, construction is progressing on the BP-operated offshore Tangguh expansion program, which will add a liquefaction unit of 3.8 MM metric ton/yr (4.19 MM t/yr) production capacity to the existing Tangguh LNG plant, lifting total capacity up by 50% to 11.4 MM metric tons/yr (12.57 MMt/yr).

“For Badak LNG, a pickup of the feed gas supply will be observed in 2021

after the Merakes field comes onstream,” Chai said, adding that Gendalo-Gehem, the second phase of the Chevron-operated Indonesia deepwater development, could also add significant new supply to the plant.

But it looks like that project will not come onstream until 2025 at the earliest; due in part to continued discussions regarding the share of production between Chevron and SKK Migas.

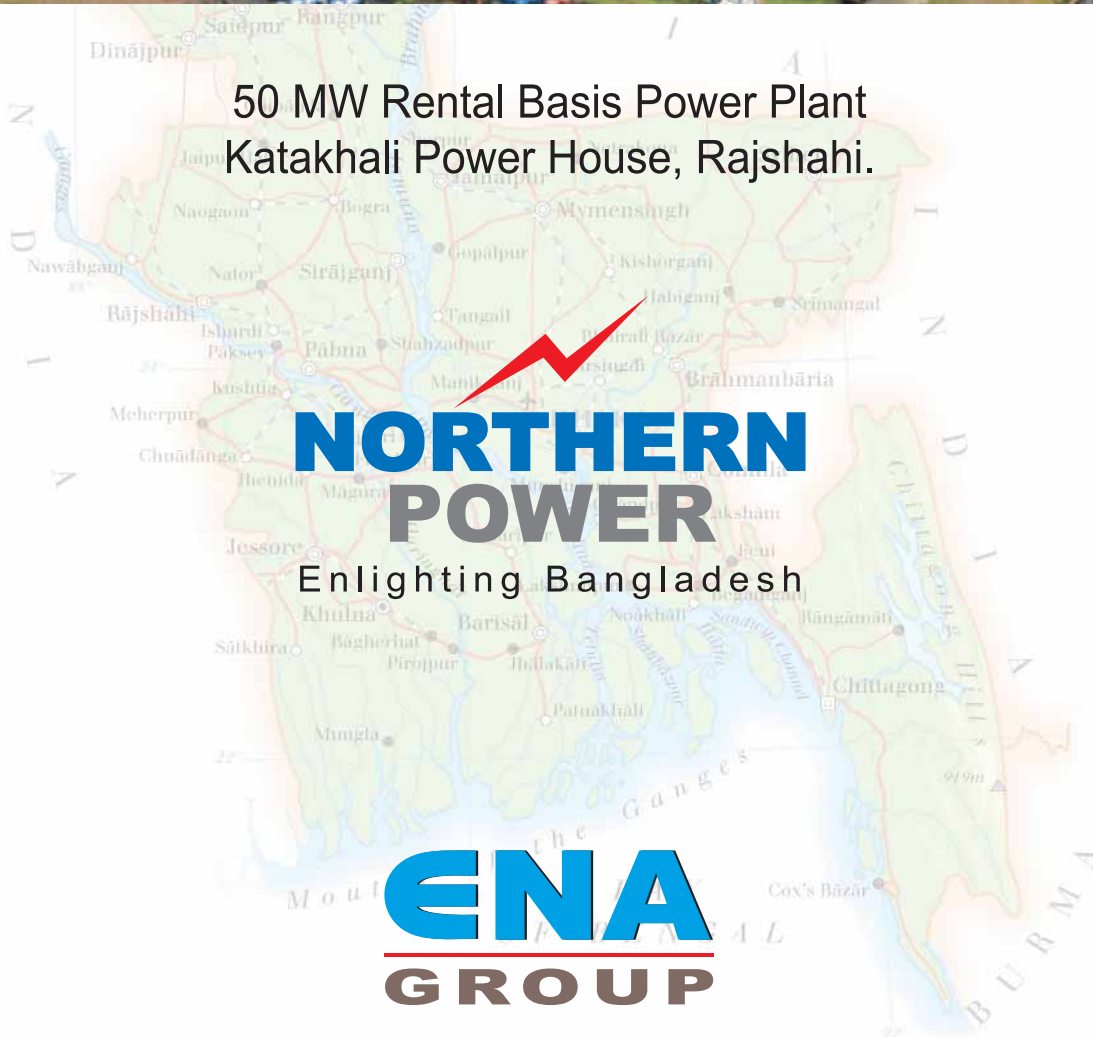
The new development plan for the offshore Abadi gas field was finally approved in 2019, but operator INPEX and partner Shell still face challenges due to the remoteness of the planned onshore Abadi LNG facility and the layout of the infrastructure.



Tangguh LNG plant



**50 MW Rental Basis Power Plant
Katakali Power House, Rajshahi.**



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Bangladesh: Potential Energy Hub of South–South East Asia

Khandkar Abdus Saleque

Surrounded by India and not very far from China, Bangladesh is in a strategic geographical location to be developed as a vibrant energy hub and linkage between energy-hungry South and South Asia. The South Asian Association for Regional Cooperation (SAARC) as a regional forum of eight countries (Afghanistan, Pakistan, India, Sri Lanka, Bangladesh, Bhutan, Nepal and Maldives) achieved very little in energy trading for regional and global geopolitics. The prolonged political rivalry between India and Pakistan, and situation in Afghanistan acted as a major impediment for sharing resources of Iran and Turkmenistan in the SAARC region. The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) and Bangladesh, Bhutan, India and Nepal (BBIN) are two other forums which now have potential for social and economic integration for exploring and sharing huge untapped energy resources of the Bay of Bengal. Hope Rohingya issue would be resolved amicably through active initiatives of BIMSTEC countries for sustainable benefits of all countries. This write up will focus on potential for collaboration in energy and power sector in the region. Particular emphasis would also be given on how Bangladesh can grow as a regional energy hub.

Located in the proximity of two of the fastest growing economies of the world – China and India – Bangladesh cannot only achieve sustainable energy security of its own but can also act as a conduit of energy and power trading in the region if the existing and emerging opportunities are effectively harnessed and exploited. For that to happen, Bangladesh needs to organize a very dynamic taskforce of qualified and committed team of Bangladeshi experts (resident and non-resident

Bangladeshis) and adopt a very comprehensive program based on extensive research. We are concerned that business as usual bureaucrat-dependent efforts may not bring that much dividends. The tri-nation Myanmar-Bangladesh-India gas pipeline, if implemented as agreed in the draft MOU initialed at Yangon in February 2005, could change the energy portfolio of this region. But for lack of political far sight and failure of Indian and Bangladeshi bureaucrats, the opportunity was lost. The very much feasible SAARC power grid even in BBIN region did not proceed at an expected pace. The huge untapped petroleum resources in the Bay of Bengal almost remained unexplored even after amicable settlement of maritime boundary disputes among Bangladesh, India and Myanmar. We are not bringing into reference Turkmenistan – Afghanistan – Pakistan – India (TAPI) pipeline with probable extension to Bangladesh here. When two countries – Pakistan and India – do not even play cricket in each others' land, how can they share energy and let one country's energy transit. In such a situation, it is highly unlikely that major energy cooperation would happen soon under SAARC or SARR/IE initiatives.

There are some concerns about major energy collaboration happening soon in the BIMSTEC region (Bangladesh, India, Myanmar, Sri Lanka, Nepal, Thailand and Bhutan). Member countries must be very proactive about resolution of Rohingya Crisis in Rakhaine area. It has soured the relation between Bangladesh and Myanmar and may dampen the efforts for meaningful win-win collaborations. China is a very important actor in the region. BIMSTEC without China being involved in some way or other may not proceed appreciably.

Bangladesh, Bhutan, India and Nepal (BBIN) appear to us a more possible initiative having huge potentials. These countries are close in proximity and already have connectivity and energy trading. Bhutan is already an electricity surplus country. This tiny land locked country can contribute significantly in supplying its present excess hydropower and potential generation capacity to BBIN power grid. Nepal at present does not have surplus. But it has huge potential for hydropower which, if jointly developed, can be a huge source of supply in the region for achieving sustainable energy security. There have been lots of talks but not much achievement so far. However, BIMSTEC initiative, if successful, can have joint venture successful initiatives in exploiting maritime resources in territorial waters and Exclusive Economic Zones can have significant collaboration in developing human resources.

SAARC Energy Ring & Energy Collaboration Under SAARC

There has been many meetings, workshops, bilateral and multilateral dialogues about setting up of SAARC power and energy grids for energy and power trading among SAARC countries. Donor agencies, development partners and even research institutions carried out extensive research on the problems and prospects of energy collaborations and win-win multilateral energy trading for benefits of all countries of the region. Launched with five countries which were once part of British India (India, Pakistan, Bangladesh, Sri Lanka, Bhutan, Nepal and Bhutan) later included Afghanistan as its eighth members. A SAARC Energy Secretariat was set up in Afghanistan. Various US government initiatives worked extensively on politician, professionals collaborations for setting up SAARC power and energy grid. There were meeting of minds among different stakeholders. Head of the Government of the countries signed various MOUs and protocols. But apart from some bilateral energy exchange, the SAARC grid remained a distant dream. India, Pakistan and Bangladesh in cases of area and

population are three larger SAARC countries. India has significant coal resource, limited hydrocarbon resources. But it is the most technology advanced nation of the region and is a rapidly developing economy. To meet its energy demand, India imports huge coal, LNG and liquid fuel from different countries. India has many large and medium power plants using different primary fuel (coal, gas, nuclear, hydropower and renewable resources). India has surplus power in many states, but there are power deficits in other states. It imports power from Bhutan and Nepal. It also exports power to Bangladesh. India has several large and medium petroleum refineries for which it imports crude petroleum from different countries. Some of its refineries have additional built-in capacities which if used to capacity can meet the entire demand of smaller SAARC nations. India has some nuclear power plants and building some more now.

Pakistan has gas, coal and hydropower. Most of its major gas fields have depleted now. But there was a time Pakistan set up too many IPPs which created a situation of surplus power generation. Unfortunately, power export from Pakistan did not happen. Subsequently for rapid depletion of Sui

Northern and Sui Southern gas fields, Pakistan suffered from huge shortage of primary fuel supply causing massive power load shedding. Pakistan started importing LNG. But Pakistan for poor economic situation could not pay the LNG suppliers on time till present Prime Minister Imran Khan took over and under some special assistance from Saudi Arabia cleared most of the outstanding payment. Still power supply situation is not that great. For meeting huge gas demand, initiatives like TAPI have been under discussion for a long time. Another pipeline IPI proceeded to a great extent. But for prolonged political crisis between India and Pakistan, TAPI and IPI may not happen in near future. Any significant multilateral energy collaboration is subject to India, Pakistan settling their political disputes or agreeing to keep energy clean of politics like Israel and some Arab neighbors.

Bangladesh is another country of large population living in a relatively small area. It has significant gas resource which they effectively utilized for power generation and industrial development. It has substantial discovered coal reserve most of which remains unexploited for dilemma of the government. Bangladesh economy grew

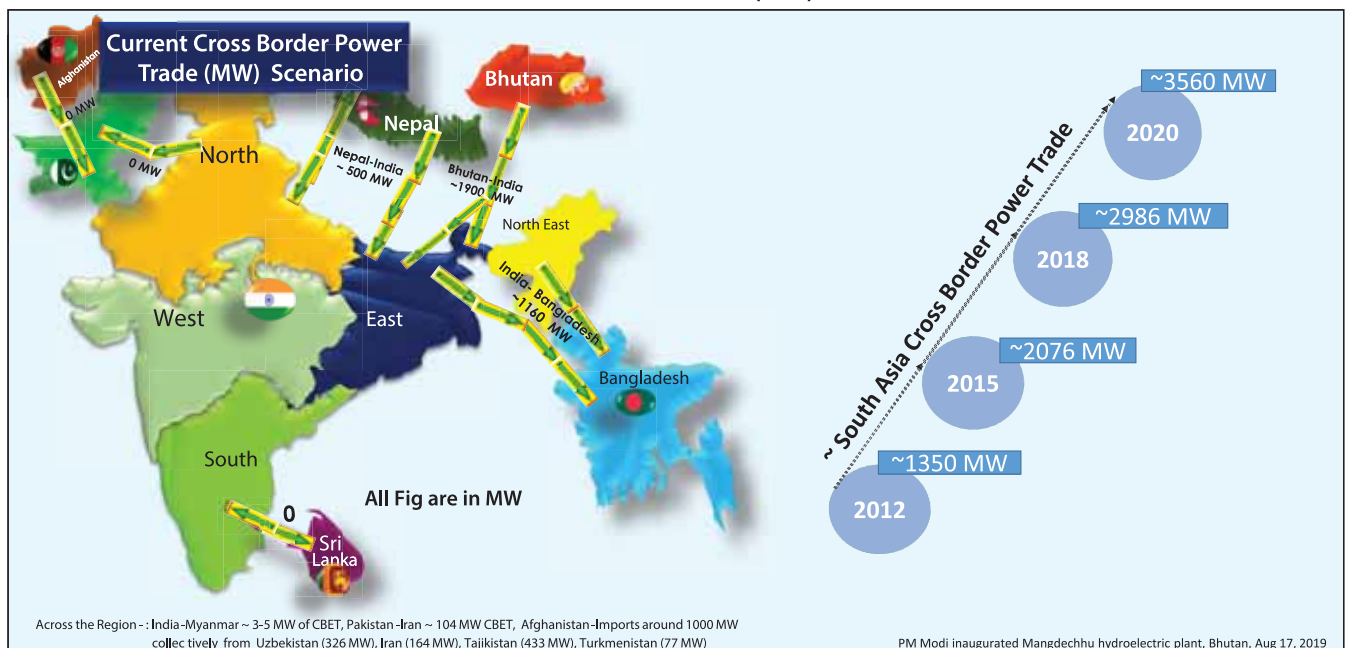
appreciably over the last decade or so for its apparently smooth primary fuel supply. But for depleting proven gas resource and hesitation for exploiting coal resource, Bangladesh has started importing liquid fuel, LPG and LNG. It has just started importing coal also. But there is a general notion that Bangladesh economy may not sustain the financial and economic challenges of imported fuel dependency over a long term. It is setting up several imported coal fired power plants and setting up coal port and terminals. It has also started importing LNG. Bangladesh has a small refinery and it imports crude and refined oil. Recently, it has started doubling the capacity of the refinery. Bangladesh is importing about 1,160 MW of power from India through two power grid connectivity.

Maldives and Sri Lanka are two island states which mostly use imported liquid fuel to generate power. Sri Lanka was in an advanced stage for setting up a large imported coal-based power plant but it was stalled for political reason. It imports most of its liquid fuel.

Bhutan: Lone Power Surplus Country of the Region

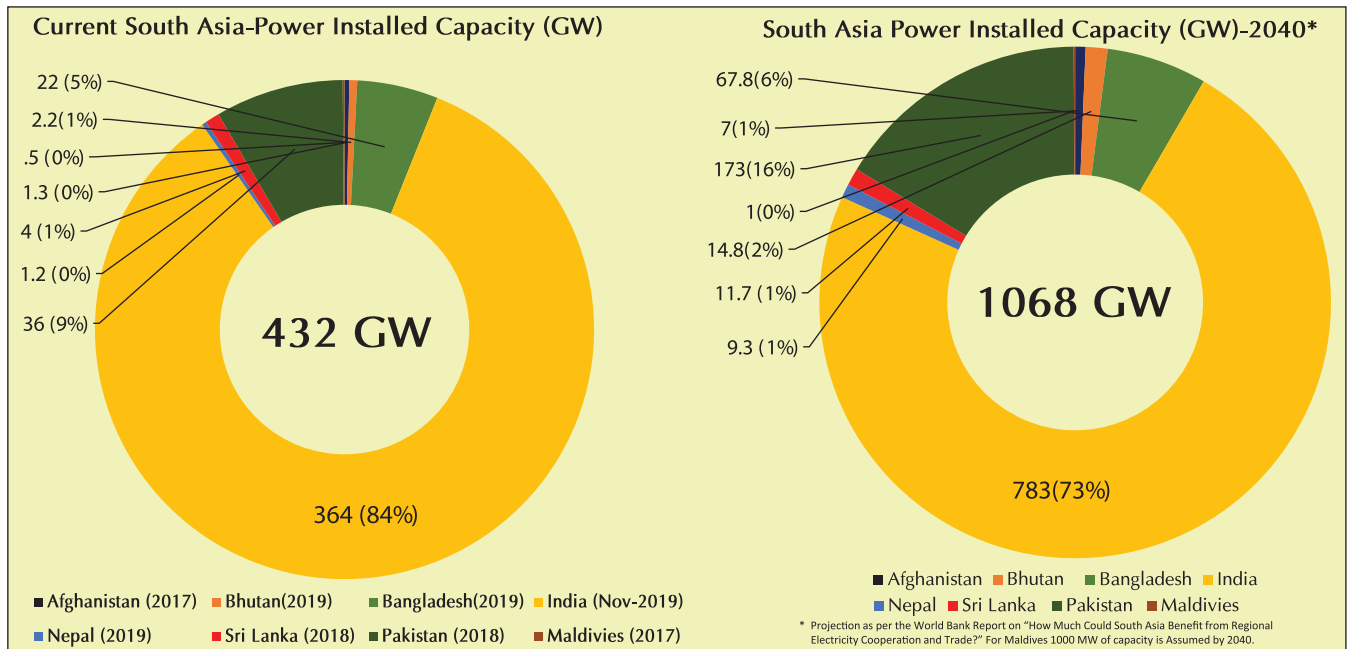
Landlocked Bhutan is the only energy surplus country of the region.

South Asia-Current Cross Border Power Trade (MW) Scenario and It's Evolution



Source: SARI/EI

South Asia Power Sector: 1068 GW by 2040



Source: SARI/EI

Energy in Bhutan has been a primary focus of development in the kingdom. In cooperation with India, Bhutan has undertaken several hydroelectric projects whose output is traded between the countries. Though Bhutan's many hydroelectric plants provide energy far in excess of its needs in the summer, dry winters and increased fuel demand makes the kingdom a marginally net importer of energy from India. Bhutan's advantage critically hinges on the excess supply of electrical energy which earns large revenue catering to the current account deficits, consequently balancing trade. Even the industrial development has mainly relied on the availability of relatively cheaper hydroelectricity. Currently, hydropower is the main resource for electricity generation whereas biomass (in the form of fuel wood) is the main resource for meeting residential energy needs, such as cooking and space heating. Imported fossil fuels include mainly petroleum products and coal. Among these, petrol and diesel are used for transport while kerosene and LPG (liquefied petroleum gas) are mainly used in the building sector.

Nepal Has Huge Potential

Over 90% of Nepal's total electricity

generation capacity is hydropower based. Hydropower plays a particularly important role in Nepal's economic future because of the scale of its potential. Nepal has the economically viable potential for over 40,000 megawatts (MW) of hydro generation capacity. If such potential is realized, it could easily meet Nepal's suppressed demand and create a surplus that could be exported to neighboring countries in South Asia under SARRC or BBIN initiatives. But the present reality is that Nepal has under contractual obligation with India for exporting most of its generated power to India as most of it has been developed under funding of India by Indian companies. Nepal also imports power from India for meeting up to 27% of its power demand.

Under BBIN initiative, Nepal can be the major source country for generating substantial hydropower by joint initiatives and sharing in the grid.

Bangladesh Can Grow As Major Energy Transit Country

Bangladesh is sitting at the center of South and South East Asia. Meaningful development of SAARC, BBIN and BIMSTEC power and energy grid and sharing of power and energy would turn Bangladesh as a conduit of collab-

oration and transit country for energy trading. Countries like India, Nepal, Bhutan and even China may use port facilities of Bangladesh for importing crude oil, LNG and LPG, and may even use these ports for export. Bangladesh, India, China and BIMSTEC countries may even work under a protocol for jointly importing coal, LNG and crude and swap coal ships and LNG vessels. This will arm them with required negotiating capability for getting better price of imported fuel. For example, some large Indian refineries in proximity to Bangladesh have to import crude using Indian ports far away and supply refined products using long aggressive hilly terrain. If these refineries can use Bangladesh port facilities for importing crude petroleum and supply refined products, the cost of production can be effectively lowered and can be supplied at much cheaper price. The refineries if operated to capacity can also meet the demand of Nepal, Bhutan, Sri Lanka and if required Bangladesh.

Additionally, Bangladesh can also be benefited from transit tariff and toll if cross-border power and gas transmission lines transits across Bangladesh.

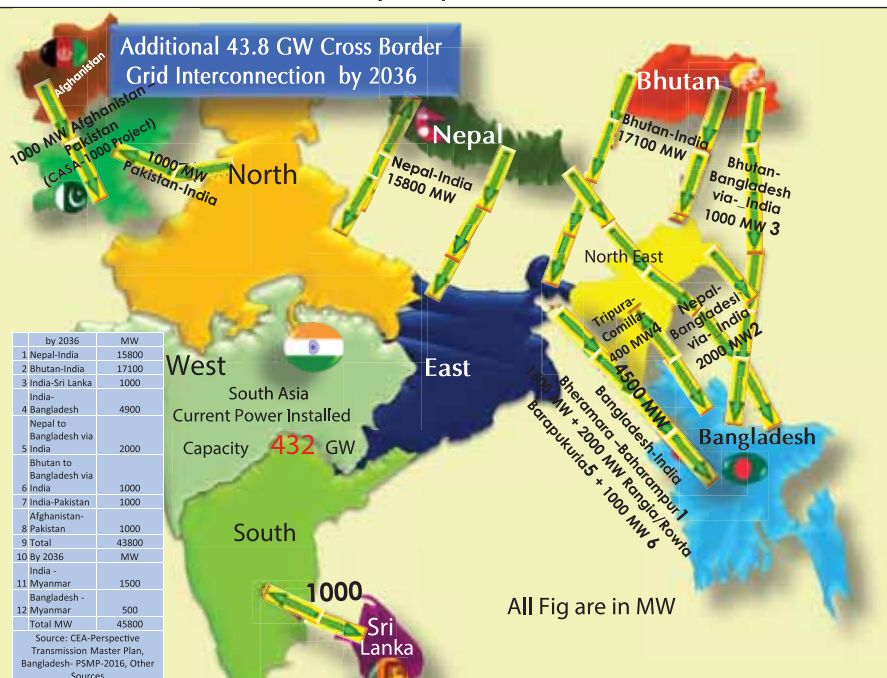
Conclusion & Recommendation

There is no denial about huge

South Asia Power Grid: Transmission Capacity-2036/2040

● Rapid Expansion is envisaged.

● 43.8 GW of cross border Grid Interconnection by 2036.



Compiled from: CEA-Perspective Transmission Master Plan, Bangladesh-PSMP-2016, Other Sources 1 Bangladesh-India Bheramara-Baharampur-Existing 500 MW 2 From Nepal 1,000 by 2030 Power import by using Case 3 T/L (upgrade to 765 kV AC) and From Nepal (Purnea-Barapukuria), 1,000 by 2025, Power import by using Case 3 T/L (initially 400 kV AC) 3 Bhutan-Bangladesh via India 1000 MW-Bonggaon/Rangia-Jamrapur 1,000 by 2030-Power import from Bhutan 4 400 MW by 2020 (100 MW existing) Construction of HVDC (500MW) in Comilla 5/5. Some load (100 MW) in Comilla (N) S/S will be disconnected from Indian System 5 1000 MW by 2023 and 1000 MW by 2025 (Power Import Using Case 2 T/L (±800KV HVDC) 6 1000 MW by 2030 Bibiyana-Meghalaya (PSPP) 7 At the Proposal Stage, detailed planning to be done.

Source: SARI/EI

potentials for extensive collaborations among countries of SAARC, BBIN and BIMSTEC region. Some countries are common in all three initiatives. Regional and global geopolitics act as deterrent for meaningful energy and power exchange under SAARC initiatives. Bilateral trading can happen between Bhutan and India, Nepal and India, Bangladesh and India. The present political impasse between Pakistan and India and situation in Afghanistan may act as impediment for uncertain period for TAPI, CASA 2000 delivering as expected. But energy trading under BBIN is very much feasible. Bangladesh, Bhutan, Nepal and India can be extremely benefitted from joint venture development of potential hydropower resources, renewable energy of the region and sharing in the regional power grid (also developed through joint venture). There are no technical issues, financing should not be a major issue and political leadership have meeting of minds. Need a big push to set the motion only.

In our opinion, meaningful collabora-

tion is also feasible under BIMSTEC umbrella. Rohingya crisis is now a global issue. UN organizations and other relevant organizations, regional countries are endeavoring for peaceful resolutions. This has not in any way acted as a barrier against regional trading of commodities. Even the business relations between Myanmar and Bangladesh have not been affected. The existence of huge petroleum and other maritime resources in BIMSTEC region, if jointly exploited and shared, can work wonder in sustainable economic development of the region. Myanmar has already discovered significant petroleum resources and is trading energy with Thailand and China. Indian, Chinese, Korean and Australian companies are engaged in exploring energy resources in the region. Myanmar has huge interest of India, China and Russia as well. Why not all taken on board for developing meaningful and sustainable energy collaboration in the region.

Another area is capacity building of technical and managerial manpower.

SAARC and BIMSTEC countries individually do not have required capacity for planning harnessing of resources, managing implementation of mega projects, adopting and practicing modern operation of facilities. Even regulatory organizations also lack capacity. Very often individual countries rely on experts and consultants from other regions. The countries could develop joint arrangement for training professionals and sharing facilities for human capital development.

It is true that there has been extensive brain storming, lot of development partners sponsored studies. But very little has been achieved. The reality is that the opportunities still exist and can be exploited. We must let economy prevail over politics and let professionals lead the way and champion the planning, programming, implementation and operation.

EP

Khandkar Abdus Saleque;
NRB Energy Professional

Looking Deep into Tariff Adjustment

Saleque Sufi

Bangladesh Energy Regulatory Commission (BERC) announced yet another increase of power tariff on February 27, 2020. This was an outcome of the public hearing conducted by BERC in December 2019 based on the proposals submitted by Bangladesh Power Development Board (BPDB) and its utilities. On a weighted average, the tariff is increased by 5.3 percent at retail level and 4 percent at wholesale level. The tariff increase comes into effect from March 1, 2020. With this increase, the retail price will become Tk 7.13 per kilowatt hour (kwh) from the present Tk 6.77. The wholesale price would become Tk 5.17 per kilowatt hour from Tk 4.77. The bulk price is applicable for the distribution utilities and the retail price is for the consumers. The last power tariff increase came into effect from December 1, 2017. Under the present circumstance, BERC or the government has no other options but to adjust the tariff. There exists huge spinning reserve. For unreliable grid power supply, industries still rely mostly on off-grid power generation. BPDB cannot terminate the contracts of most of the liquid fuel based contingency power plants for fuel supply (own gas) constraints. BPDB as per contracts has to account for significant amount of capacity charges to the plant owners though these, in many instances, remain idle. Increasing reliance on imported primary fuel adds cost. Huge investment in updating and modernizing power transmission grid and distribution networks adds cost for the utilities. But it has to be critically and objectively analyzed whether this power tariff increase would make significant impacts on other utilities and business in general.

As usual the tariff increase will have domino effect on many aspects of cost of living. Fixed income citizens would not only face higher electricity cost but also their house rent may increase and price of most essential goods, industrial

products in the market would also increase whatever marginal the power increase may be. Price of water has already been increased. When the Sustainable Development Goal (SDG7) is to ensure supply of quality power to all at affordable cost, it needs to be seen whether the government is moving towards achieving SDG7. Quality of supplied power is not ensured yet on uninterrupted basis. The government cannot ensure sustainable supply of primary fuel. Power generation cost has increased as huge capacity charge is being paid to owners of the generators remaining idle. Grid power demand did not increase as industries are mostly relying on own off-grid captive generation. In such chaotic power sector scenario, BERC's fixation of power tariff hike would obviously be bitterly criticized. But given the present scenario, the government has no option but to increase power tariff as it cannot continue accounting for huge subsidy for indefinite period. Endeavoring for more fuel-efficient power generation, adopting affordable fuel mix, effective demand side management through use of energy-efficient star-rated appliances can economize power use and can keep cost of power within affordable limit.

BERC's Fixation of Tariff

BERC has announced slabs at which power tariff would be applicable. Bill has to be paid Tk 5.72 per unit for using 76-200 units per month, Tk 6.00 per unit for using 201-300 units, Tk 6.34 per unit for using 301-400 units, Tk 9.94 per unit for 401-600 units and Tk 11.46 per unit for using over 600 units. This means consumers using more power will have to pay higher rates.

However, for irrigation pumps the farmers will pay Tk 4.16 per unit and small industries would pay Tk 8.53 per unit at flat rate. However, industries at off peak hours would pay at Tk 7.68 per unit but at peak hours the rate payable would be

Tk 10.24.

The consumers will have to pay Tk 12 per unit of electricity during the construction period of any building. Educational, religious institutions and hospitals would pay Tk 6.02 per unit. This rate would be applicable for the connections using single phase 230-400 volts. However, the residential consumers using 11 kV lines would pay Tk 8.40 per unit as flat rate, Tk 7.56 per unit for off-peak hour and Tk 10.50 for peak-hour use. The same category commercial and office consumers would pay Tk 9.12 per unit as flat rate, Tk 8.21 for off-peak hour, and Tk 11.40 for peak-hour use. The industrial 11 kV MT lines consumers would pay Tk 8.55 per unit as flat rate, Tk 7.70 per unit for off-peak hour and Tk 10.69 for peak hours.

Obviously, the power tariff increase would be widely discussed, debated, contested and protested at different levels of social fabric, social media, electronic media, print media by civil society and political activists.

For discussing and analysing the rationale and logic of power tariff increase or adjustment whatever we term it, a basic understanding of power value chain and power tariff structure would be useful. Power value chain has four segments –generation, transmission, distribution and retail services. In Bangladesh, various public companies (BPDB and others) and private companies under contracts with the BPDB generate power. BPDB is the single buyer. Bangladesh Power Grid Company Limited as government utility is the single company discharging the responsibility of evacuating power from different generators and delivering to power distribution companies. BPDB and some government-owned distribution companies like DPDC, DESCO, NESCO, WZPDCL, REB and others distribute power and also carry out retailing. Apart from these many industries have their own off-grid captive power generation facilities. As claimed by BPDB, the present installed power generation capacity of grid-connected power is 19,570 MW of which 1,160 MW is imported from India. In addition,

the known capacity of off-grid captive generation is 2,800 MW. The highest generation so far has been recorded as 12,893 MW on May 29, 2019. Natural gas (own and LNG), coal (own and imported), liquid fuel (furnace oil, diesel), hydro and renewable energy are in the fuel mix of power generation in Bangladesh. In near future, nuclear power would also be added.

Cost of power generation depends on cost of primary fuel used, technology used in generation, efficiency, operational cost control. To deliver the generated power to consumers transmission cost, distribution and supply margin are added. Power tariff is determined adding all these and also adding profit margin of utilities.

Many of the Bangladesh power plants are still using age-old fuel-inefficient technologies. Gas supply constraint requires using expensive imported liquid fuel. Huge spinning reserve leaves a large capacity remaining idle and consequently capacity charge requires to be paid. All these add up to cost of generation. Higher cost of generation constitutes higher tariff eventually, even after paying huge subsidy.

Tariff Structure

Tariff structure is a set of rules and procedures that determines how to charge different categories of consumers. Typical tariff structures include:

a. Flat-rate tariff is plain and simple a single tariff applicable to all based on actual power used.

b. Volumetric tariff is based on actual metered consumption (with different variables, constant volumetric tariff, increasing block tariff, and peak-load pricing).

c. Multi-part tariffs include two part tariffs, where users pay by both a monthly fee for access and usage fee for consumption and optional tariffs where consumers are offered a menu of pricing plans.

Tariff structure depends on few factors like characteristic of the network, and objectives pursued through policy. The charges differ between customer classes

(residential, commercial and industrial). The tariff structure is either regulated or defined by the operators themselves with minimum regulatory oversight depending on degrees of competition in the sector and whether the government and the operator have similar objectives.

An effective tariff structure requires taking into account financial viability (ensuring that the maximum revenue is recovered), cost-effectiveness (charging the consumers in a way that reflect the costs plus a reasonable return on investment), efficiency (setting prices at marginal costs) and social acceptability (ensuring that charges are reasonable so that all customers receive at least basic services and that subsidies are efficiently targeted).

We hope BERC has carefully scrutinized all the pros and cons on the basis of basic fundamentals. Our question here is what led the policymakers going for such huge spinning reserve without considering how the huge capacity charge requires to be paid to generators remaining idle would impact on cost of generation? Why power to all program has been hurried? Would making grid supply reliable enough for getting rid of significant off-grid captive generation? Why all out initiatives were not taken for exploiting local coal resource and expediting onshore and offshore exploration of petroleum? Why government became so keen to adopt fuel import option knowing fully well that setting up of import infrastructure in shallow Bangladesh coast line is prohibitively expensive and time consuming? Bangladesh is now in catch 20. They cannot avoid phased increase of power tariff and fuel price.

Designing Efficient Power Tariff

There are few critical steps involved in designing efficient power tariff. These are:

- Gathering information about operators activity and demand forecast;
- Evaluating the effectiveness of the current tariff structure and the need for reform;
- Announcing the reform; and
- Implementing the proposed reform.

One of the matter of significant importance is correctly assessing whether the operator predicted excessive level of investments and estimated the correct cost of service, covering justified costs and accounting for inefficiencies. Other important aspect is evaluating the economic efficiency meaning that the volumetric change should be set in alignment with the short-run marginal costs of bringing an additional unit of service.

We are not very sure whether BERC did all these while determining the power tariff.

Conclusion

We appreciate the governments all round initiatives and drives for achieving sustainable supply of quality power to all at affordable costs. But while designing mega plans for power and energy sector, certain very important aspects were not examined in great details. There exists a serious lack of coordination between two important organs of MPEMR – power and energy division. This has led to a situation where achieving sustainable supply of primary fuel and achieving affordable fuel mix become a huge challenge. There has been lack of coordination among different segments of power value chain. Power grid is not yet reliable and efficient for evacuating a significant volume of generated power and distribute efficiently to all consumers. Industry is not yet confident about sustainable supply of quality power. About 3,000 MW off-grid captive generation stays in the system for which effective grid power demand remains below 13,000 MW. This causes significant capacity remaining idle requiring payment of huge capacity charge. All these compel utilities going for pledging for power tariff adjustment and BERC tariff adjustment determination. People cannot be burdened for flawed planning and poor overall sector management, which is unfortunately the case here.

EP

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Saleque Sufi;
Contributing Editor, EP



লাফস গ্যাস

লাইফ হবে স্বচ্ছন্দ ও নিরাপদ

লাফস গ্যাস-এর মূল শক্তি আন্তর্জাতিক মান, স্বাস্থ্য ও নিরাপত্তার নিশ্চয়তা এবং পরিবেশ ও জীবন যাত্রার মান উন্নয়নের প্রতি দায়িত্ববোধ। সর্বাধুনিক প্রযুক্তি ও নিরাপদ সিলিন্ডার সরবরাহের মাধ্যমে বাংলাদেশসহ বিশ্বের লাখো মানুষের জ্বালানী চাহিদা পূরণে লাফস গ্যাস প্রতিজ্ঞাবদ্ধ।

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West Zone Power to Create Over 800 Skilled Electricians in 5 Yrs

West Zone Power Distribution Company Ltd (WZPDCL) has undertaken a program to create over 800 efficient electric technicians in the next five years as part of its move to celebrate Mujib Borsho to mark the birth centenary of Father of the Nation Bangabandhu Sheikh Mujibur Rahman.

According to official sources, the distribution entity working in the country's south-western region is successfully running two courses to train up unemployed youths to turn them into efficient electricians.

"We've already concluded the training of the second batch of the course titled 'Consumers Electrician Trade Course'," said an official.

He said his organization has taken up a long-term program to create 810 efficient electricians in the next five

years through conducting 27 training courses.

Of the courses, seven will be run till March 2021 as those began in September 2019 while the remaining 20 will be conducted over the next four years, he said.

Thirty people will be trained up under each course while 210 will receive training during the Mujib Year, he said.

The remaining 600 people will get training over the next four years.



"The specialty of the training course is that it's being offered to lower or lower-middle class people of rural areas free of charge," he said adding that the unemployed and less-educated underprivileged youths living in districts and upazilas are the target group of this program.

EP

Cabinet Okays Draft Protocol on RNPP with Russia

The Cabinet recently endorsed the draft of a protocol to be signed for receiving assistance from Russia over the operation and maintenance of the Ruppour Nuclear Power Plant after the construction of the country's first nuke plant.

The approval came from the weekly Cabinet meeting held with Prime Minister Sheikh Hasina in the chair at her office.

"It's essential to receive assistance from Russia for properly

running and maintaining the Ruppour Nuclear Power Plant after launching its operation as it's the first nuke plant in the country and Bangladesh has no experience of the operation and maintenance of such a plant," Cabinet Secretary Khandker Anwarul Islam said while briefing reporters at the Secretariat after the meeting.

The protocol will be signed for bringing amendments to the agreement signed on November 2, 2011 between Russian and Bangladesh on

Expedite Rooppur Nuke Plant Project: PM



Phase Minister Sheikh Hasina has asked the authorities concerned to accelerate the implementation of the Rooppur nuclear power plant and build necessary infrastructures rapidly to transmit electricity to the northern region once the mega plant starts to operate.

The premier came up with the directives at a meeting of the fast-track project monitoring committee at the Prime Minister's Office (PMO) recently.

"If necessary, you can take alternative ways to accelerate the project activities," the Prime Minister told the project officials, expressing disappointment over slow progress of the mega power plant project.

The power plant project has made physical and financial progress of only 21.83 per cent till December 2019.

Prime Minister's Principal Secretary Dr Ahmad Kaikaus will

take the lead in the efforts for accelerating the project, officials said.

Taking stock of the rapid industrialization in the country's northern region, the prime minister also stressed the need for increasing the power supply capacity as the demand for electricity continues to rise in the northern region.

She also directed the project officials to take up realistic river-crossing projects for supplying the electricity from the nuclear plant.

The government has formed the Nuclear Power Company Bangladesh Ltd to implement the power plant project, senior secretary of science and technology Anwar Hossain informed the premier at the meeting.

He said the company has already appointed 581 scientists and engineers for the project. Another 254 scientists will be appointed soon, he added.

EP

Cooperation Concerning the Construction of a Nuclear Power Plant on the Territory of Bangladesh.

The Cabinet Secretary said the Nuclear Power Company Bangladesh Limited will run the Ruppour Nuclear Power Plant after its construction is completed with the assistance

of Russia in line with the existing intern government agreement.

He said now the company is recruiting manpower for operation of the nuke power plant and Russia provides trainings to them under the general contract signed with Russian Federation.

EP

Dighipara Has 706m Tonnes Movable Coal

The Dighipara basin in Dinajpur district is the second largest among the discovered coal fields in Bangladesh, having around 706 million (70.60 crore) tonnes of extractable coal reserves.

According to a feasibility study report, Dighipara has a high quality coal resource of 706 million tonnes with a high level of confidence.

The feasibility study was jointly conducted by Germany-based MIBRAG Consulting International GmbH, FUGRO Consult GmbH and Runge Pincock Minaroo Limited of Australia.

It said coal is deposited on 12.8 square kilometres land and the government can extract three million (30 lakh) tonnes of coal from the mine every year. It is technically

possible to mine 90 million tonnes of coal from Dighipara allowing the powering of Thermal Power Station for 30-40 years.

The study report said, the energy content of the coal is high and the ash content is low and the coal is overlain by a very thick sequence of semi-consolidated material that host large volume aquifers.

The consortium understands that the delivery of more than 3.0 million tonnes of high quality thermal coal from the Dighipara lease area is a critical element in the ongoing energy security and energy growth in Bangladesh.

Contribution from this project area was planned as a part of the overall Bangladesh Energy Master Plan.

EP

NBR Tightens Rules for Duty-Free Import of Power Plant Equipment

The National Board of Revenue (NBR) has tightened the rules regarding duty-free import power plant equipment in a bid to curb abuse of the privilege through import of materials not directly related to power

plant construction.

The revenue administration listed 20 items -- including steel sheet, rod, cement, household goods, office furniture, dredger, anchor boat and vehicles -- that are outside the purview of zero-duty import benefit for power plants, according to a notification issued recently.



Posco Stays Back from Hydrocarbon Extraction

Posco International has withdrawn its decision to relinquish deep sea (DS) block-12, seeking an extension of its contract for another year with a higher 'commercial term'.

The South Korean oil and gas firm has also called the state-run Petrobangla for negotiations to amend the existing provision in the production-sharing contract (PSC) for better fiscal benefit.



"We received a letter from Posco last week about its latest decision to stay back in deep sea hydrocarbon exploration," a senior Petrobangla official said.

He said the letter has been sent to the Energy and Mineral Resources Division, or EMRD, under power, energy and mineral resources min-

istry for a decision.

Sources said a hike in the latest model production-sharing contract (MPSC) for next offshore bidding round might have prompted Posco to relinquish the block in expectation of a higher price.

As per the PSC, Posco would get gas price at \$6.50 per mmBtu (million British ther-

m a l unit) with a 2.0 per cent annual price escalation from

the date of first production.

But the newly adopted MPSC has set gas price at \$7.26 per mmBtu with a 1.5 per cent annual price rise from the date of first gas production.

Currently, no oil and gas exploration is being carried out in deep offshore blocks in Bangladesh.

EP

The list comes based on a recommendation from a panel formed by the NBR last year as items as random as dredger, boulders, steel sheets and pipes were imported duty-free in the name of power plant construction.

This gave rise to fears of revenue loss among customs officials.

Subsequently, the revenue authority has decided to barricade items unrelated to power generation from the exemption benefit.

Since 1997 the customs au-

thority has been offering the privilege to public and private power producing companies to import machinery, spare parts and materials needed for erecting the plants.

However, no specific list of products was mentioned in the notification.

And in the absence of clarity, products not directly related to power plants were being imported by firms based on recommendations from the Power Division.

EP

Research Achievement by Bangladeshi Engineer in USA



Dr. Arshad Mansoor

The Board of Directors of the Electric Power Research Institute (EPRI) announced recently the promotion of Dr. Arshad Mansoor, Senior Vice President of Research and Development, to the position of President, effective January 1, 2020.

Mansoor will continue to lead the execution of EPRI's research strategy, while expanding his role in leading corporate functions. Mansoor was selected after an extensive national search. He continues to report to EPRI's

Chief Executive Officer, Dr. Michael Howard, who has served as President and CEO since 2011.

"Arshad Mansoor is widely regarded in the energy sector as excelling in articulating a vision for research across the entire energy value chain. His leadership and pursuit of innovation, in both technology and operations, inform the industry in all aspects from boardroom strategy to R&D program creation and execution," Howard said, "Mansoor has also worked tirelessly to expand EPRI's global leadership in the electricity sector."

"Arshad's focus on the global energy sector's transition to deep decarbonization and efficient electrification is essential as the electricity sector transitions to a cleaner and more resilient energy network," said EPRI's board Chair and PNM Resources Chairman, President and CEO, Pat Vincent-Collawn.

EP

Germany Assures Bangladesh of Lasting Support

Economic diversification in Bangladesh is of paramount importance for the country's continued growth and competitiveness in the global market, according to

German Ambassador Peter Fahrenholtz.

"The diversification of Bangladesh's economy is crucial for the country to ensure competitiveness in the global market," he said, while addressing the opening ceremony of the Bangladesh German Consultation 2020.

With an aim to further boost bilateral trade between the



Peter Fahrenholtz

Bashundhara LPG to Empower Indomitable Women

Country's leading liquefied petroleum gas (LPG) brand Bashundhara LPG will provide sustainable employment to 10 indomitable women in every three months who are struggling for managing their livelihood through small initiatives, officials said at a press meet recently.

Marking the International Women's Day, Bashundhara LPG, a sister concern of Bashundhara Group, has taken the project titled 'Your single contribution, let increase livelihood of women' which will manage sustainable employment to 10 underprivileged women in every three months through its supply chain.

Noted litterateur and Kaler Kantho Editor Imdadul Haq

Milan and singer Anima Roy were special guests at the press meet at International Convention City Bashundhara (ICCB) in the capital.

Among others, Bashundhara Group Head of Business Development ZM Ahmed Prince, ICCB Chief Executive Jashim Uddin, Bashundhara LPG Chief Financial Officer Mahbub Alam, General Manager Zakaria Jalal and Deputy General Manager Sarwar Hossain were present on the occasion.

Officials informed that Bashundhara LPG will expense for livelihood development of indomitable women showing respect to their struggle to spark as bread earner of families and to contribute in workforces.

EP



two countries, the event was held at the Economic Relations Division (ERD) recently.

Bangladesh is on course to graduate from the least developed country status but the country's economic growth must continue in accordance with its Sustainable Development Goals.

The garment sector could benefit from the ongoing dialogue on the GSP between Bangladesh and the Euro-

pean Union, said Fahrenholtz, adding that there is a good chance for the country to become eligible for the GSP Plus facility after its graduation.

The GSP, or Generalized System of Preferences, is a program designed to encourage monetary prosperity in developing countries by providing duty-free treatment to goods of designated beneficiary countries.

EP

AIIB Approves \$ 200m Loan for Electricity Project in BD

The Asian Infrastructure Investment Bank (AIIB) has approved a 200 million US dollar loan for a Bangladeshi project to improve access to electricity and service efficiency in capital Dhaka and elsewhere in the country.

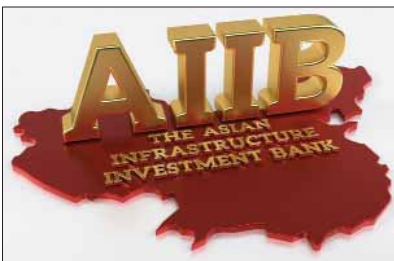
While the Bangladeshi government has implemented various programs to meet growing demand for power, mainly as a result of rapid industrialization and urbanization, about 22 per cent of the population still lack access to electricity, said the Beijing-

based lender in a statement posted on its website recently.

It is estimated that poor power supply has resulted in about 2-3 per cent loss to Bangladesh's gross domestic product annually, with significant sums spent on diesel generators for backup, said the bank.

By 2025, it said the Dhaka and Western Zone Transmission Grid Expansion Project is expected upon completion to reduce the number of annual power outages to 15 (from 60), reduce transmission loss to 2.50 per cent (from 2.76 percent) and add 7,440 megavolt-amperes of power transmission capacity.

EP



5.48 Lakh Tonnes Coal Pilfered from Barapukuria: CAB

An investigation commission of Consumers Association of Bangladesh (CAB) recently claimed that the actual quantity of stolen coal from the Barapukuria Coal Mine was 5.48 lakh tons higher than what was estimated by the Anti-corruption Commission (ACC).

The CAB investigation com-

mission disclosed its finding at a press conference at Dhaka Reporters Unity (DRU) in the city.

Head of the investigation commission Syed Abul Mak-sud read out its report while CAB adviser Prof M Shamsul Alam, commission members Prof Badrul Imam, Prof MM Akash, Prof Susanta Kumar



10.6 Lakh Prepaid Meters Installed So Far



Bangladesh Rural Electrification Board (BREB) has so far installed 10.60 lakh smart pre-paid meters across the country with a view to reducing system loss, pilferage of power, overbilling and harassment of power consumers.

BREB is installing 50,000 more smart prepayment meters with its own finance increasing the total number of consumers under pre-paid meter coverage to 11.10 lakh. The total number of consumers under BREB is 2.75 crore.

"We have installed 33 lakh prepaid meters so far out of the total 3.62 crore electricity consumers across the country," State Minister for Power, Energy and Mineral Resources Nasrul Hamid said recently.

He said the government will bring all consumers under smart pre-payment metering system aimed at reducing system loss, pilferage of electricity, over billing and harassment of subscribers.

He said Northern Electricity Supply Company (NESCO) Limited signed an agreement with a Chinese firm for manufacturing smart pre-payment meter in the country.

"The BREB is working for electricity supply to every corner of the country having grid facility by June 2020. The government led by Prime Minister Sheikh Hasina has been working relentlessly to bring all citizens under power coverage and our generation capacity reached to 22,787 MW," Nasrul said.

EP

Das, and member secretary architect Mobasher Hossain responded to various questions from reporters.

They said they have covered all the aspects of coal extraction and delivery during the period between 2005 and 2018.

They said they checked all the documents and found that not only the 23 officials of Barapukuria Coal Mine Company, who were previously identified, but also

many officials of Petrobangla and Energy Division and that of state-owned Bangladesh Power Development Board (BPDB) were involved in the pilferage.

Earlier, the Energy Division admitted that it has got 1.44 lakh tons of coal missing from its stock, prompting the ACC to file a case against 19 officials of Coal Mining Company and Petrobangla. The case is now pending for trial.

EP

Science Olympiad for University Students of RNPP Region Ends

The weeklong science festival titled 'Precise Energy' for the students of the universities in the under construction Rooppur Nuclear Power Plant has ended with the holding of concluding ceremony at Ishwardi on February 28, 2020.

Main objective of the Olympiad was to create greater interest of students in science education.

The Olympiad was organized by a Russian organization-Energy of the Future in association with Ministry of Science and Technology and Bangladesh Atomic Energy Commission.

The program was powered by Russia's state atomic en-

ergy corporation-ROSATOM, Its engineering division-Atomstroyexport (ASE) - general contractor of Rooppur NPP and MEPhI- national research nuclear university.

Over 1,600 students from Rajshahi University, Rajshahi University of Science and Technology, Pabna University of Science and Technology and Kushtia Islamic University registered for participation in the primary round of the Olympiad. Out of them 150 students were selected for participation in the final round, where they had to appear at a 3 hours long written examination either in Physics or Mathematics or Chemistry based on their preference.

EP



KGDCL to Install One Lakh Prepaid Meters in Ctg

Karnaphuli Gas Distribution Company Ltd (KGDCL) will install one lakh gas meters in the port city by its own fund.

After installing 60 thousand domestic gas meters in the first project, the KGDCL has proposed to install one lakh prepaid gas meters with own funding under 3rd project.



The prepaid gas meter has become popular among the domestic gas consumers due to austerity of gas consumption. The installation of two lakh gas meters under the second phase faced a thaw due to lack of foreign assistance. The KGDCL has taken the third project for installing one lakh meters with own funding.

Yeafesh Osman Inspects Progress of RNPP Equipment Manufacture



A Bangladesh delegation headed by Architect Yeafesh Osman, Minister for Science and Technology, visited the Volgodonsk Branch of AEM-technology (part of a Mechanical Engineering Division of Rosatom) in Russia on February 27, 2020.

Main purpose of the visit was to check the status of manufacture of Rooppur Nuclear Power Plant (RNPP) equipment for two units of under construction Rooppur NPP in Bangladesh.

As of today the upper semi-vessel and the lower semi-vessel of a reactor have already been manufactured, the steam generator vessels for unit 1 are in line for installation of headers. During next month specialists will finish welding.

The delegation saw for themselves the installation of internals in the steam generator

and welding of the steam generator vessel parts, evaluated the progress of the reactor pressure vessel manufacture. Specialists of the plant briefed the delegation on main manufacturing processes and inspection events. Both the sides discussed issues related to optimization of inspection process during equipment manufacture, compliance with the equipment production time-schedule.

AEM-technology is manufacturing two reactors with internals and two sets of steam generators for two units of Rooppur NPP.

"It is not just a business project. It is a project of two friendly countries. The project is progressing in the spirit of friendly cooperation", said Yeafesh Osman during his visit.

EP

The third project is expected to start shortly.

The project proposal of the third project for installing one lakh meters with own finance will be sent to concerned ministry next month, the MD

said. Following the approval of the concerned ministry, the project proposal will be presented before the next ECNEC meeting for finalization of the project work, the source added.

EP

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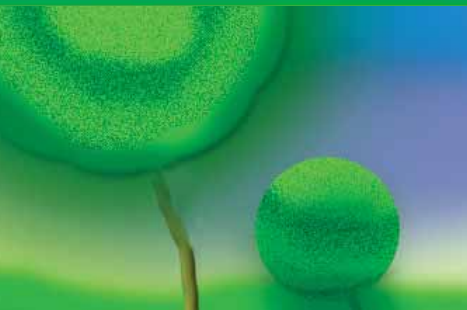
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Greenpage

Govt to Launch 'Green Factory Award'

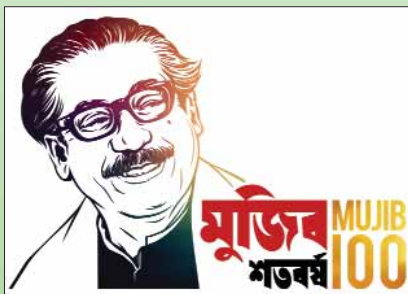
The government has decided to introduce the 'Green Factory Award' in the country's industrial sector, commemorating the birth centenary of Father of the Nation Bangabandhu Sheikh Mujibur Rahman.

The Ministry of Labour and Employment will distribute the award on April 28 on the occasion of the National Occupational Health and Safety Day.

The decisions were taken at a meeting held at the conference room of the ministry recently with Labor and Employment Secretary KM Ali Azam in the chair, a

ministry press release said.

In addition to this, the ministry decided to take a year-long program to celebrate the Mujib Year in a befitting manner.



The meeting was informed that the ministry will organize an international seminar on the life and works of Father of the Nation Bangabandhu Sheikh Mujibur Rahman.

It also decided to arrange a seminar at

the capital's Osmani Auditorium in the month of mourning - August - where two eminent personalities, including an international one, will present keynote papers.

EP

Solar Power Becomes Boon for Char People

Solar power has appeared blessings for many char people in Rajshahi as it turns the dreams of the locals into reality by bringing changes to their living and livelihood conditions.

People living in many hard-to-reach villages on the banks of Padma River in Paba, Godagari and Bagha upazilas of Rajshahi and Sadar and Shibgonj upazilas of Chapainawabganj districts started to dream by using solar power.

Abu Kalam, a solar power user in Char



Mazar Diar of Paba upazila, said he could not even think about electricity a decade ago. But now it has become a reality as the villagers can avail it.

He added his village has become illumined with uninterrupted electricity generated from solar panel. The power also brings many positive changes to living and livelihood condition of the villagers in many ways.

AVA Mini Grid Project introduced 594 solar panels with financial initiative of Infrastructure Development Company Limited (IDCOL) providing power supply to six villages.

At present, the panels are generating 148.5 kilowatts electricity and the villages are getting power through the distribution line. He said the villagers are enjoying the power supply facilities through prepaid card system and all of them are happy.

EP

Toyota Plans New \$1.2b EV Plant in Tianjin with FAW

Japanese automaker Toyota plans to build a new electric vehicle plant in the Chinese city of Tianjin with its local partner FAW Group, a document from the local authorities showed.

The joint venture between Toyota and FAW plans to invest around 8.5 billion yuan (\$1.22 billion) in the planned car plant in Tianjin, according to a document issued by authorities of the China-Singapore Tianjin Eco-city.

The plant will have manufacturing capacity of 200,000 new energy vehicles a year, the document showed. In China,



new energy vehicles include battery-only, plug-in hybrid and fuel-cell vehicles.

Toyota declined to comment on the project but said in a statement that the company regards China as one of its most important global markets and is constantly considering various measures to implement in China to meet the needs of growing the business in the country.

Last year, despite China's overall auto market dropping 8.2 per cent, Toyota sold 1.62 million Toyota and premium Lexus cars in China, the world's biggest auto market, a 9 per cent sales jump compared with a year earlier.

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Govt Likely to Install Solar Power Plant at Matarbari

The state-owned Coal Power Generation Company Bangladesh Limited (CPGCBL) is likely to set up a solar-based power plant at Matarbari area with the Japan International Cooperation Agency (JICA) funding.

The CPGCBL is now implementing a mega coal-fired power project having capacity to generate 1200MW of electricity in Cox's Bazar.

Besides, it will seek funding for implementing another same capacity of power project, official said.

According to power system master plan, renewable energy generation capacity is

targeted 10 percent of the total generation. Now, the government is generating 357MW of electricity from renewable electricity.

During the visit of JICA vice-president in Matarbari coal-fired power project, the CPGCBL approached to JICA vice-president for financial assistance to implement solar power project including

feasibility study in Matarbari Island, CPGCBL Managing Director Md Abdul Mottalib informed the Power Division last week.



The CPGCBL has already submitted land acquisition proposal to Cox's Bazar DC office for 490 acres of land adjacent to Matarbari 1200MW super critical coal fired power plant, he informed the power division.

EP

Greenpage

Dutch Govt Doubles Renewable Energy Subsidies to €4bn

The Dutch government has announced it will double the amount of money available under its renewable energy subsidy program to €4 billion (£3.4bn) in 2020, in a bid to meet its obligations to cut greenhouse gas emissions by 25% by the end of 2020.

The government previously planned to offer a total of €2 billion (£1.7bn) in clean energy subsidies.

Eric Wiebes, Minister of Economic Affairs and Climate Policy said: "The extra money is intended to help the country meet its promise to cut carbon dioxide emissions."



Eric Wiebes

"There are a large number of projects that can offer a cost-effective contribution."

Separately, the government introduced a new €4,000 (£3,450) grant for buyers of new electric cars.

The Netherlands generated 18% more electricity from renewable resources last year than in 2018, with solar power in particular showing strong growth, according to preliminary figures from Dutch national statistics office CBS.

EP

SINGER Launches Green Inverter ACs

Leading consumer electronics and home appliances company SINGER has launched environment friendly and energy saving Singer Green Inverter Air Conditioners.

Managing Director and CEO of Singer Bangladesh MHM Fairoz, Marketing Director, Chandana Samarasinghe and Sales Director, Mokbulla Huda Chowdhury formally launched the product at a ceremony

recently, said a press release.

Its Green inverter technology, Gold Fin technology and eco-friendly R410a refrigerant not only saves more than 60% electricity but also ensures less carbon emission and prevents release of greenhouse gasses.

Singer is offering 5 years compressor warranty and 3 years warranty for spare parts and service.

Singer Green Inverter Air Conditioner comes in three models of 1, 1.5, and 2 tons. The price range varies from Tk 47,990 to Tk 83,990.

EP



7.5% of Maldives' Energy Needs Met by Solar

President Ibrahim Mohamed Solih, on occasion of the 70th anniversary of the State Electric Company Ltd (STELCO), revealed that 7.5 percent of Maldives' energy production is generated through solar photovoltaic (PV) systems.

Speaking at the ceremony held at convention centre Dharubaaruge recently, President Solih noted that many efforts were made to further install solar systems during the administration's first year.

While Maldives is capable of generating 21.5 megawatts of energy through renewable sources, at the time of this pub-

lication, President Solih alluded to an additional 51 megawatts to

be installed in 2020.

Currently, STELCO conserves 3500 litres of diesel on a daily basis, saving a total of MVR 1.2 million each month.

Minister of Environment Dr Hussain Rasheed Hassan previously iterated the ministry's aim to produce 20 percent of all energy requirements through renewable sources by 2023.

Various high-level officials throughout the Solih Administration, including the President himself, have advocated for further research into untapped renewable energy sources such as wind, swell and currents.

EP



President Ibrahim Mohamed Solih and State Electric Company Managing Director Hassan Mughnee, during the ceremony to mark the 70th anniversary of the state utilities company of Maldives

UK Includes Solar in New Generation Capacity Auction

The announcement by the Department for Business, Energy and Industrial Strategy of an auction which will include solar next year appears to back prime minister Boris Johnson's claims to be serious about the nation's net-zero carbon ambition.

Prime minister Boris Johnson's plans for next year's capacity auction to include solar have been warmly welcomed.

The U.K. government appears to have welcomed solar, onshore wind and

other well-established renewables technologies in from the cold by announcing plans for a new generation capacity auction next year.

The procurement round announced yesterday by the Department for Business, Energy and Industrial Strategy (BEIS) will be the first to include "Pot 1" generation technologies solar, onshore wind, hydro, landfill gas, sewage gas and energy-from-waste plus combined heat and power (CHP) since 2015, when David Cameron's government bowed to pressure to halt incentives for onshore wind farms.

EP

Greenpage

Italian Firm Finalizes Acquisition of ABB Inverter Business

Italian inverter maker Fimer has completed its purchase of ABB's manufacturing and R&D sites in Finland, India and Italy, along with 800 employees in 26 countries. Fimer said the combined business will ship more than 7 GW of inverters this year.

Italian inverter manufacturer Fimer has completed the acquisition of the inverter business of Swiss conglomerate ABB which it started in July.



Fimer confirmed the transaction included all of ABB's manufacturing and R&D sites in Finland, India and Italy and 800 employees in 26 different countries. The buyer still has not announced the full cost of the deal and ABB also failed to do so in its July financials.

The Swiss company did, however, admit it would shoulder six-year costs of around \$430 million (€388 million) in relation to the transaction, connected to product warranty provisions. ABB also said it expected 'separation costs' of \$40 million as a result of the deal.

The new owner said ABB's inverter business generated around €340 million in revenue last year.

EP

Chevron's Asset-Cut Plan Bad Signal for Bangladesh

Serajul Islam Quadir

Sometime last year, perhaps almost at the end of last year, Chevron, one of the largest energy firms in the USA, said that it was planning to reduce the estimated or nominal value of its asset by about \$11 billion in the fourth quarter. In January 2020, Chevron posted a \$6.6 billion loss in the same quarter due to \$10.4 billion worth of write-offs related to shale gas production in Appalachia and deep-water projects in the Gulf of Mexico.

Appalachia is a cultural region in the Eastern US that stretches from the Southern Tier of New York States to northern Alabama and Georgia. According to a report of Forbes, USGS estimated 214 trillion cubic feet of natural gas in Appalachian basin formations. It also said that Appalachian basin produces more natural gas than any OPEC country.

Just one month before i.e. in December 2019, the company warned that this change would be between \$10 billion and \$11 billion.

The company's upstream operations in the USA lost \$7.5 billion in the quarter, down from \$964 million a year ago. That was primarily due to \$8.2 billion in write-offs related to Appalachia and Gulf of Mexico operations, as well as lower crude and natural gas price. The amount that Chevron wrote down was as much as more than half of it from its Appalachia natural gas assets after a slump in prices.

There is a rumor that Chevron might consider to sell off its shale gas holdings. The US oil major also intended to sell off its share in the Kitimat liquefied natural gas project in Canada. This project is located at Canada's British Columbia province. The firm is also planning to maintain this year's capital budget at \$20 billion, the third consecutive year it did not increase its expenditures.

US natural gas futures prices have slumped this year amid a supply glut, and are now averaging about \$2.54 per million British thermal units. If it finishes the

year at that level, it will be the lowest average price since 1999.

The move to write down Appalachian gas may put pressure on other producers in the region to follow Chevron. Chevron has tightened its belt as much as possible and its capital spending globally has halved since 2014. The action is a brain work of Mike Wirth, the chief executive officer, whose motivating slogan is only circled with capital discipline.

The excessive gas supply is particularly pronounced in North America where shale production is flooding local markets. Wirth said his decision to walk away from certain gas assets illustrates the company's discipline in protecting shareholders' interest.

"The best use of our capital is investing in our most advantaged assets," Wirth said in a statement, available in company's website. "With capital discipline and a conservative outlook comes the responsibility to make the tough choices necessary to deliver higher cash returns to our shareholders over the long term."

Impact of Write-Down

The write down came as Chevron lowered its long term forecast for oil and gas prices which directly impacted the value of its assets. This decision would cost the entire market and reduce total S&P earnings by \$1.32 though Chevron said that the aim of write-down was designed to seek to revalue some of its assets as commodity prices continue to falter.

Standard & Poor's or S&P is a leading index provider and data source of independent credit ratings. S&P was founded in 1860, offering financial market intelligence.

"We regularly take a look at our long term outlook for commodity markets," Wirth of Chevron said.

"As we do that, we also look at our assets and we evaluate which will deliver the highest returns on investments for our

shareholders, and the assets in the Northeastern US, along with same in Canada and other parts of the world simply don't compete as well for our investment dollar as others do."

Last year Chevron reported a 36% drop in third-quarter profit, hit by lower oil and gas prices and suffering margins. It also warned higher cost did affect fourth-quarter results.

Impact on Bangladesh

Chevron is the largest gas producer in Bangladesh – supplying about 58% of gas for consumption for the country from its three gas fields in the Northeast. Several thousands of people in and around Chevron's areas of operations in these areas are being benefited through partnerships with the local community.

Earlier in 2017 Chevron planned to invest \$400 million in the country's gas sector. Last year Chevron expressed its willingness to carryout exploration study in some onshore blocks to find out new natural gas prospects which is essential for the country as excessive gas exploration from three gas fields, particularly from Bibiyana, is a point of great concern.

The proposal to carryout exploration study was the first working program in the country since October 2017, when it withdrew its decision to leave the country. But now a cloud of worries covered the whole scenario with the latest decision of write-down of its assets. New exploration is a must for Bangladesh as gas reserve is depleting fast.

Earlier Bangladesh's junior minister for power and energy Nasrul Hamid said that gas fields in the country have begun to deplete, an indication that the gas resources of the country will be exhausted in 8 to 9 years.

So given the reality, we must look for more international oil companies to come forward for investment in this sector. We should not depend on Chevron only as it has been facing crisis.

EP

Serajul Islam Quadir;

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জ্বালানী খাতে টানা দ্বিতীয় বারের মতো
সেরা বেসরকারি
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Climate Crisis on Back-Burner as Pandemic Threat Looms

Economic shock waves from the coronavirus outbreak have curbed carbon pollution from China and beyond, but hopes for climate benefits from the slowdown are likely to be dashed quickly, experts say.

As governments prepare to spend their way out of the crisis, including with large infrastructure projects, global warming concerns will be little more than an afterthought, dwarfed by a drive to prop up a stuttering world economy, they say.

Preparations for a make-or-break climate summit in November are already off track, with host Britain focused on its Brexit transition, and the challenge to its health system of the gathering epidemic.

Like an unintended lab ex-

periment, the global health emergency demonstrates the cause-and-effect relationship that drives global warming.

In the four weeks up to March 1, China's discharge of CO₂ fell 200 million tonnes, or 25 percent, compared to the same period last year, according to the Centre for Research on Energy and Clean Air (CREA) -- equivalent to annual CO₂ emissions from Argentina, Egypt or Vietnam.

As the country's economy slowed to a crawl, coal consumption at power plants in China declined by 36 percent, and the use of oil at refineries by nearly as much.

Other major economies are bound to sputter too.

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Manage Clinical Waste Hygienically: Experts

Experts at a participatory discussion have unanimously urged to bring all hospital (clinical) wastes under hygienic management to protect the environment from pollution and contamination.

They made the call at a day-long workshop, styled 'Medical Waste Management (out-

house management) with Government approved

committee under Rajshahi Division/City Corporation' in Rajshahi city.

Directorate General of Health Services (DGHS) and Rajshahi City Corporation (RCC) jointly organized the workshop at the conference hall of Rajshahi City Bhaban recently.

Addressing the workshop, the



IUB Holds Seminar on Climate Change



Universities need to give due importance on climate change research, where capacity building would be the most crucial area, said discussants at a recently held seminar at Independent University, Bangladesh (IUB) in the capital recently, said a press release.

The event was titled "The role of the International Centre for Climate Change and Development (ICCCAD) at the IUB in the UN Framework Convention on Climate Change and plans for the 26th annual Conference of Parties (COP26)".

Prof Saleemul Huq, director of IUB's ICCCAD, gave the keynote presentation. Judith Herbertson, head of DFID Bangladesh; Sudipto Muker-

jee, resident representative of UNDP Bangladesh; and Dr Nurul Quadir, former additional secretary of Ministry of Environment, Forests and Climate Change, discussed various aspects of climate change and made implementable suggestions for upcoming COP26.

Matin Chowdhury, chairperson of IUB trustee board, and Prof Milan Pagon, vice chancellor (acting) of the university, assured everyone that necessary support to conduct effective research will be provided.

Prof Md Abdul Khaleque, dean of IUB's School of Environmental Science & Management, moderated the seminar.

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speakers observed that management of the clinical wastes is very important for establishing an eco-friendly atmosphere in all the hospitals, diagnostic centres and clinics.

DGHS Director Dr Belal Hossain and Divisional Director of Health Services Dr Gopendra Nath Acharya attended the program as the chief and special guests respectively. RCC Secretary

Abu Hayat Rahmatullah chaired the event.

Deputy Director of the Department of Environment Munir Hossain, Civil Surgeon Dr Enamul Haque, Vice Principal of Rajshahi Medical College Professor Dr Bulbul Hossain and local unit President of Private Medical Practitioners Association Dr Abdul Mannan were also present and spoke.

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Energy Sector Carbon Emissions Fall to Lowest Level Since 1990

Last year saw the biggest falls in global electricity generation from coal and power sector carbon emissions since at least 1990, analysis suggests.

Electricity generation from coal fell 3% in 2019, which led to a 2% fall in carbon dioxide emissions from the power sector, according to the worldwide assessment by climate think tank Ember, previously known as Sandbag.

Though it is the biggest fall on both counts since at least 1990 when the International Energy Agency (IEA) started reporting on them, declining coal generation is not yet "the new normal", Ember warned.

Limiting global warming to 1.5C above pre-industrial levels, which scientists warn is needed to avoid the worst impacts of climate change, looks extremely difficult, Ember said.

While coal power collapsed in the EU and the US, Chinese electricity from the fossil fuel grew last year and the country is responsible for half of global coal generation, the analysis found.

The fall in coal is partly due to a structural shift towards wind and solar but also relied on one-off factors, such as nuclear generation being restarted in Japan.

It would need to collapse at a rate of 11% a year up to 2030 to keep global warming to 1.5C, the report from Ember warned.

The US coal collapse – down 16% in 2019 – is undermined in terms of its climate impact by the fact the power sector has mostly switched to gas.

In the EU, coal generation fell by 24% and the bloc is leapfrogging from coal straight to wind and solar power, according to Ember which has previously published annual analysis of electricity transition in the EU.

Wind and solar generation rose by 15% in 2019, generating 8% of the world's electricity.

This level of growth needs to continue for many years to tackle the climate crisis, which is possible with falling prices but will require a concerted effort from all regions, the report said.



The World Is On Fire: Greta

Greta Thunberg denounced politicians and the media recently for ignor-

ing a looming climate cataclysm, saying that they were failing her generation with

their inaction in the face of a world on fire.

Several thousand



BRAC Bank, Future Carbon Sign Deal



BRAC Bank Limited has ushered a new journey towards sustainability as it signed an agreement with Future Carbon Ltd, a leading environmental consultancy firm in Bangladesh, to combat the adverse impacts of climate change.

Future Carbon Ltd. will assist BRAC Bank to adopt an energy-efficient and carbon neutrality strategy for its in-house operations, making great strides to become the most sustainable bank of the country.

Selim R. F. Hussain, Managing Director and CEO, BRAC Bank Limited; and Ashfaq Ahmed, Managing Director, Future Carbon Ltd.; exchanged the agreement on behalf of the respective organizations at the bank's Head Office in Dhaka recently.

Brigadier General Tushar Kanti Chakma (Retd.), Head of General Services, Tahmina Zaman Khan, Head of Sus-

tainability; Aminul Hoque Sarwar, Head of Procurement, Shahriar Rahman, Senior Manager, Sustainability; BRAC Bank Limited; and Raden Siddiqui, Director of Operations, Future Carbon Ltd; were also present.

Commenting on this occasion, Selim R. F. Hussain, Managing Director and CEO, BRAC Bank Limited; said: "As a member of the Global Alliance for Banking on Values, BRAC Bank believes in the philosophy of people, planet and prosperity and works towards making the environment healthier and planet more habitable for all. BRAC Bank is committed to align its carbon footprint with Paris Agreement and this particular initiative will not only contribute to the sustainable development goals of the country but also will cater to the philosophy of the bank 'People, Planet and Prosperity' within the organizational framework."



people attended a rally in the southwestern English city of Bristol to see Thunberg, the teenage activist who has rimanded governments across the world over climate change.

"I will not be silenced while

the world is on fire - will you?" said Thunberg. "This emergency is being completely ignored by the politicians, the media and those in power. Basically nothing is being done ... despite all the beautiful words."



Bangladesh Air Worst in World

Air quality in Bangladesh was the worst in the world last year and Dhaka was the 21st most polluted city, according to 2019 World Air Quality Report.

However, Dhaka was second worst among capital cities.

"Using a weighted population average, Bangladesh emerges as the most polluted country, based on available data," said the report released recently.

Taking population into account, Bangladesh emerged

as the country with the worst particulate matter (PM) 2.5 pollution, followed by Pakistan, Mongolia, Afghanistan and India, said the report jointly released by IQAir Group and Greenpeace.

It said the Bahamas, US Virgin Islands, Iceland, Finland, and Estonia were the top countries in terms of healthy air.

The report said air pollution would pose one of the biggest threats to human health, with 90 percent of the global population breathing unsafe air.

Bangladesh's air quality was the worst in the world also in 2018. **EP**



Europe's Firms Must Double Low-Carbon Investment

Europe's top companies need to more than double their current level of spending on low-carbon projects to meet the European Commission's flagship goal of "climate neutrality" by 2050, according to a report released recently.

The major study of 882 publicly traded companies across multiple sectors by climate research provider CDP and consultancy Oliver Wyman showed they spent 124 billion euros (US\$134.1 billion) on capital investment and research and development in 2019, report agencies.

That amounted to around 12 per cent of total investment.

To be on track to meet the goal of net-zero emissions by 2050 however, that figure needs to jump to 25 per cent, said CDP Europe's Managing Director Steven Tebbe.

The biggest areas for new investment were electric vehicle technologies, with spend



BD Lauded for Measures to Combat Climate Change



Global leaders have praised the government of Bangladesh for its commitment and measures to fight the adverse impacts of climate change.

They showered praise on Bangladesh and its leadership during the board meeting of Global Centre on Adaptation held in Paris recently, said the Ministry of Foreign Affairs in Dhaka.

They lauded Prime Minister Sheikh Hasina and Foreign Minister Dr AK Abdul Momen for successfully holding its last meeting of the Global Centre on Adaptation (GCA) in Dhaka.

Dr Momen, during the meeting, urged the global community for special focus on

South Asian region while allocating funds and programs for its extreme vulnerabilities to climate change.

He put emphasis on the need for technology transfer, recognising local based solution and innovation and public awareness for combating the menace of climate change.

Dr Momen also gave an account of the activities that Bangladesh has undertaken steps to adapt to the harmful impacts of climate change, including developing flood, drought and salinity resistant seeds, harvesting rainwater, rooftop gardening, introducing boat-schools, floating agriculture, trust fund from own resources etc. **EP**

of around 43 billion euros, renewable energy, at 16 billion euros, and energy grid

infrastructure, at 15 billion euros, the report said.

"Some European companies are making bold new low-carbon investments to roll out renewables, build greener infrastructure, buy electric vehicles and make manufacturing more energy-efficient," Tebbe said.

"But there is a huge opportunity to do more, and we need to see more action across the board." **EP**



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'Energy Tariff Hikes Become Inevitable Due to Flawed Policy Decisions'

There is no technical issue about mining coal from Phulbari, but there are socio-economic issues that would trigger political problems. On the other hand, failure of the government in exploring petroleum resources has made the government to increasingly leaning towards import of Liquefied Natural Gas (LNG). And again, this flawed strategy will let the government continue increasing the fuel price and power tariff. I do not think this will facilitate industrialization at the expected pace.

Prof Dr. Badrul Imam, Supernumerary Professor of Dhaka University, said this at an exclusive interview with Energy & Power Editor **Mollah Amzad Hossain**.

What are your views about the present scenario of primary fuel supply and continued price hike?

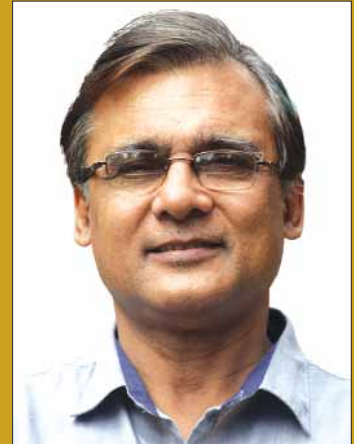
If the presently pursued policy continues, the price will continue to increase. The use of own primary fuel is diminishing and import of coal, LNG and liquid petroleum products are increasing. The government has to spend US\$ 3.0 billion annually for importing 1,000 MMCFD of LNG. In 2025, about 2,500 MMCFD of LNG is expected to be used. Imported LNG would drive the price hike of gas and electricity. There would be no option but to increase the price on continuous basis and in frequent intervals. In my opinion, the government's policy of overly leaning towards LNG is a flawed decision. Expedited actions for oil and gas exploration especially in the offshore over this period could have brought better dividends. That could have delayed the requirement of LNG import. The present unpleasant situation in energy sector has been created due to serious negligence and failure of the government in exploring and exploiting own fuel resources.

The left over 11 Tcf own gas may completely deplete by 2031 at the present rate of using it. As a result, the use of imported LNG will continue to rise. In phases, the government will have to import up to 6,000 MMCFD of LNG. What could be the impact on the economy in 2041?

In my opinion, the vision for mid-income and developed economy is, without any doubt, the outcome of an honest desire of the government. But the energy projection has been made linking it with the GDP growth. I have doubt whether it is appropriate. I would like to question why the government is getting increasingly reliant on the imported primary fuel. The stress, created with the import of expensive fuel, would impede smooth and planned industrialization in Bangladesh. The government must adopt policy and start implementation of exploring and exploiting own primary fuel resources.

What do you think Bangladesh should do for getting gas supply at affordable price?

I think, we must stick to Bangabandhu's doctrine and vision for energy. For that we have to attach top priority of utilizing own fuel. There is no doubt that the government has drifted away from the Bangabandhu's energy vision. BAPEX and Petrobangla could not be developed like PETRONAS or even ONGC though we got a long period of time. For lack of adequate care by the government, BAPEX could not reach where it should have been by now. They discovered eight gas fields. Bhola North is also their latest discovery. But the government could not come out of a negative mind set about BAPEX till now. However, there exists no other option of getting low cost gas supply without strengthening and relying on BAPEX.



Prof Dr. Badrul Imam

All modes of regional energy trading will auger well for energy security of Bangladesh. Our failure for letting tri-nation gas pipeline transiting across Bangladesh from Myanmar to India deprived us from getting cheaper pipeline gas. Now, Myanmar is not longer in a position to supply any gas to Bangladesh.

The BAPEX alone policy on onshore exploration could not achieve expected success in discovering new gas fields. Do you think onshore exploration like offshore should also be let out for PSC bidding?

Exploration in the complicated geologic entities like high-pressure zones, tight gas sands and other unconventional prospects can be let out for PSC bidding. On the other hand, in some identified difficult geologic terrains and disturbed structures as in the Chittagong Hill Tracts BAPEX can work with carefully-selected foreign partner in joint venture for further exploration. The remaining blocks and ring-fenced areas in the onshore should be kept preserved

for BAPEx. There were some initiatives for engaging JV partner of BAPEx for exploration in the Chittagong Hill Tracts region. I am not sure why the initiative was stalled. But BAPEx presently does not have the required experience or capacity for offshore exploration. Offshore exploration must be let out for PSC bidding.

We must take a note that the discovery of Bhola North, a complex structure, evidences BAPEx's maturity as an exploration company. This followed a round of 3D seismic survey and successful interpretation for locating the drill point in northern Bhola island. Previously the company discovered the first gas field named Shahbazpur in the central part of the island. The geologists of BAPEx strongly believe that should the company allowed to run further 3D seismic surveys, similar gas prospects would be found in southern part of Bhola island. BAPEx is definitely competent for exploration in Bhola on stand alone basis. We cannot find any logic of letting GAZPROM working in Bhola instead of BAPEx. This has seriously undermined the BAPEx's capability. Rather, if BAPEx is supported with finance and manpower, they are competent enough for working there successfully. There are scopes for attracting NRB experts to work with BAPEx.

Do you think any special initiative should be taken for exploration in the western region, deeper prospects/ high-pressure zones and CHT structures for oil and gas exploration? If so, what are your suggestions?

I mentioned earlier IOCs can be engaged for exploration in unconventional gas prospects like high pressure zone, tight gas, synclinal plays etc. Also BAPEx can work in joint venture with competent IOCs for further exploration in the difficult terrains and complicated structures in CHT. GAZPROM may be invited for deep drilling in the high-pressure zones. Fresh controversy would be created if GAZPROM is engaged in the BAPEx discovered fields for development. Similar flawed action was taken in handing over Petrobangla owned Jalalabad Gas field to Occidental for de-

velopment which is now being operated by Chevron. BAPEx must be given required money and allowed to recruit and retain competent technical professionals and management experts with attractive remuneration for expeditious exploration and development works in all other onshore blocks and frontier areas.

I think, we must stick to Bangabandhu's doctrine and vision for energy. For that we have to attach top priority of utilizing own fuel. There is no doubt that the government has drifted away from the Bangabandhu's energy vision. BAPEx and Petrobangla could not be developed like PETRONAS or even ONGC though we got a long period of time. For lack of adequate care by the government, BAPEx could not reach where it should have been by now. They discovered eight gas fields. Bhola North is also their latest discovery. But the government could not come out of a negative mind set about BAPEx till now.

We have actually failed to start exploration in the deep water prospects of the Bay of Bengal after so many years of resolution of maritime boundary disputes with neighbors. What needs to be done?

Exploration could have started in 2016 if right decisions could be taken at the right time. Energy and Mineral Re-

sources Division (EMRD) completely failed to take the right actions on the basis of Petrobangla initiatives in 2015 for developing database on information which was supposed to be acquired through multi-client surveys. Favorable environment for attracting foreign investment from IOCs prevailed at that time for higher price of crude in the global market. It is frustrating that we have failed to avail of the opportunity for exploiting resources even after 8 years of resolution of the maritime boundary disputes with neighbors' India and Myanmar. Myanmar has achieved commendable success in offshore exploration in their offshore area, adjacent to Bangladesh boundary, over this period.

Petrobangla has just reportedly concluded a contract now for multi-client survey with recommended bidder. But it is too late to give fruits for the upcoming bidding round. The multi-client survey could not be done this season and the results would not be available before a year and half if not more, at the least. I have doubt whether Petrobangla can attract IOCs in such situation as they are set to go for fresh bidding round for deep offshore in March/April 2020. However there is no option of waiting for a single day. Encouraging response from the IOCs is linked with the data package along with the bidding document.

I believe there is bright prospect for finding significant gas resources in blocks adjacent to maritime boundary with Myanmar. Over the last several years Myanmar has successfully discovered significant gas in Rakhain offshore following the settlement of maritime boundary dispute with Bangladesh. There is no geologic or natural divide between Rakhain offshore in Myanmar and Bangladesh offshore. And we believe the next large gas fields in Bangladesh will be discovered along the southeast maritime boundary area with Myanmar depending on our efforts to engage in exploration. The data SANTOS acquired at SS11 also has encouraging prospect and supports the above notion in my opinion, getting good news from offshore is only a matter of

time. The quicker we can engage IOCs through fair and competitive bidding more chances of discovering resources earlier.

How do you think new technology being adopted in national exploration ventures?

Technology in petroleum exploration and production has been improving in the western world very fast. Fracturing and horizontal drilling is common in north America and Europe and can produce ten times more gas than a vertical well for example. At a time of intense indigenous gas crisis in Bangladesh, such technology can significantly increase production rates in our gas fields. It is good to see the interest of high ups in the administration for such technology, but planning for its application in our gas field is not forthcoming!

Exploration of own coal is being discussed over a long time. What the government should do for starting mining at Phulbari and Khalashpir?

There is no technical problem for open pit mining at Phulbari. But in the context of Bangladesh, a large open pit mine would create significant social problem. That will also create political crisis. This is because coal seam is deeper at Phulbari. That is among the reasons BHP backed out from mining the coal after discovering it. Possibly from that consideration, the Prime Minister of Bangladesh is not giving green signal for mining at Phulbari. But I find no issue for commencing underground

mining at Khalashpir agreeing with the recommendation of the consultants.

What the government should do for open pit mining at Barapukuria and mining at Dighipara?

The depth of seam at Dighipara is 300-407 meters. There is no scope of open pit mining from there. In the Barapukuria coal basin underground mining is running in the central part where coal seam occur at greater depth, but coal seams occur at shallow depths at the northern part of the Barapukuria Basin. A feasibility study for small to moderate scale open pit mining in the northern part should be undertaken and appropriate action should be taken on the recommendation of the study. BCMCL has acquired land in the northern part and the local people reportedly have interest in such a mine. The government is likely to get social acceptance from the local people for the mine.

Civil society in its report alleged pilferage of 5.48 tonnes of coal from Barapukuria. What do you think about it?

CAB in its report pointed out unethical practice of BCMCL in mine management. The report on Barapukuria that the civil society produced has not pointedly blamed any person for coal going unaccounted for. Rather it has pointed out how flawed system has let this coal being lost. This has brought into light the malpractices done in coal management and supply from the mine-mouth to the power plant and to private parties.

How would you evaluate BBIN and SAARC Energy Cooperation? India is exporting power to Bangladesh. What do you think are the issues to develop it to multi-country power trading in the region?

All modes of regional energy trading will auger well for energy security of Bangladesh. Our failure for letting tri-nation gas pipeline transiting across Bangladesh from Myanmar to India deprived us from getting cheaper pipeline gas. Now, Myanmar is not longer in a position to supply any gas to Bangladesh. We must proceed with prospect of energy trading under BBIN and BIMSTEC umbrellas. BIMSTEC collaboration must also include energy trading rather than confining it to power trading. At the same time, we must explore the possibilities of accessing the Iran-Pakistan-India (IPI) and Turkmenistan-Afghanistan-Pakistan-India (TAPI) cross border regional gas pipelines. Russia is now dominating gas trading to Western Europe.

How it is possible to carry forward the BIMSTEC Energy Cooperation given the existence of Rohingya Problem?

Please note that Rohingya crisis is a globally addressed crisis now. Bangladesh is working in regional and global forums for resolving the crisis. But Bangladesh and Myanmar has trade relation going unabated. I do not think Rohingya crisis will have major impact on BIMSTEC Energy Cooperation.

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