



JAPAN FOUNDATION

International Conference
on
**Energy Security in South Asia Plus:
Relevance of Japanese Experience**

28-29 October 2015

Dhaka, Bangladesh



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About BIISS

The Bangladesh Institute of International and Strategic Studies (BIISS) is a statutory and autonomous institution established on June 25, 1978 for undertaking and promoting research and deliberation on international affairs, security and developmental issues. The institute is also expected to advance knowledge and understanding of contemporary international and strategic issues in national and regional perspectives.

The main activities of the institute are carried out by the Research Faculty consisting of a team of full-time researchers with varied social sciences background. The institute is autonomous in formulating its own research policies and agenda. The research agenda of BIISS is continually adapted to the dynamics of national, regional and global changes. There are five divisions in the Research Faculty, which are i. Defence Studies; ii. Strategic Studies; iii. International Studies; iv. Non-traditional Security Studies; and v. Peace and Conflict Studies. Each division is headed by a Director.

The Administrative Wing, headed by a Deputy Director (Admn.), and the Library & Documentation Centre, headed by a Deputy Director (Lib & Doc), of the institute are the two other important wings providing support services and valuable inputs to research pursuits of the institute.

Each year BIISS holds a number of national, regional and international seminars, conferences, workshops, panel discussions and brain storming sessions of topical and national interests. BIISS has established institutional linkages with a number of similar academic and research institutions within and beyond South Asia. Details and activities of BIISS are available on BIISS website:<http://www.biiss.org>

Background of the Conference

Energy security has always been a global concern. With modernisation, the use of energy has been increasing rapidly and people's life and national economy becoming more and more dependent on the usage of energy. Since the last century, global consumption of primary energy has doubled¹ and in future, the consumption is projected to rise rapidly. According to an estimate, world energy consumption would increase 53 per cent from 2008 to 2035 in a business-as-usual scenario, if no additional policy actions are taken to address energy issue.² Affluent economies around the world have invested a tremendous sum of money to energy research and energy exploration to keep the production going. In spite of this, the threat of energy deficiency looms large for the future. Hence, the question of energy now governs the economies and foreign policies of many nations.

South Asian region is a vital part of this world with its huge population base and rapid growing economy marked by increasing GDP. Not only are its economies growing rapidly, but the demand for energy is also ascending at an unprecedented rate. Access to efficient, clean and cheap energy has become a critical issue for the functioning of its economies. The uneven distribution of energy supplies among South Asian countries and the critical need to widely access energy resources has led to significant vulnerabilities for its economies. Moreover, the energy sources are scattered across the borders and not a single country in this region has been able to fully harness it due to shortage of funds, lack of technical know-how, scarcity of technology and expertise to develop current energy sources while seeking alternate sources for the future. Also threats to energy security in South Asia are caused by lack of political will among several energy producing countries to share resources with neighbouring countries, as well as by the lack of regional cooperation in distributing energy. Apart from regional issues, rising costs of fossil fuels (specifically, oil and gas) and environmental hazards caused

¹ See, Economic and Social Commission for the Asia and Pacific (ESCAF), *Energy Security and Sustainable Development in Asia and the Pacific*, Bangkok: United Nations, 2008, available at <http://www.unescap.org/publications/detail.asp?id=1286> accessed on 14 May 2011.

² Kensuke Kanekiyo, "Energy Outlook of East Asia and Challenges for Sustainable Development", Paper presented in the Regional Workshop on *Dealing with Energy Vulnerabilities: Case Studies of Cooperation and Collaboration in East Asia* organized by the RSIS Centre for Non-Traditional Security (NTS) Studies on 09-10 December 2010 at Singapore.

by coal-generated power plants will add to energy insecurity in the foreseeable future.

In this backdrop, improved energy planning is proving to be more and more an absolute necessity for South Asia. Thus, there is a pressing need to increase power supply and diversify energy sources but that involves choices like how to produce the power, whether from burning gas - the availability of which is dwindling or by using coal - the reserves of which are vast and remain largely untapped. The countries of South Asia also need to develop its energy sources in a sustainable manner commensurate with the region's environment and security. It cannot afford to live in energy crisis in perpetuity as it hinders the region's industrial growth, economy, trade and commerce and hence the general welfare of the people sharing the same civilisational background.

Japan is one of the top countries that have been providing assistance to the countries of South Asia in its development process. Since stability and development in South Asia is Japan's policy priority, Japan-South Asia cooperation in this regard will greatly benefit this region. The countries of South Asia and Japan have embarked on a number of projects and outlined the modalities of future engagement in several sectors. For example, Japan is providing assistance to Bangladesh to set up highly efficient coal-fired energy generation technology that can greatly benefit Bangladesh to meet its growing energy demands while reducing greenhouse gas emissions. Japan is supporting India's energy policies as well. Japan has also extended its support to develop electricity and power sector in Sri Lanka. It assisted Nepal in its hydro-power project. It is believed that considering its experience, expertise and financial support, Japan can play an even more important role in improving South Asia's energy capacity.

Rationale

As indicated earlier, South Asia is the 'growth zone' of this decade and an important fragment in the ascendancy of 'Asian century'. Nevertheless, South Asian countries, so far, has been heavily dependent on energy imports, i.e. imported crude oil and petroleum products, to manage its energy requirements. Moreover, countries

like Sri Lanka that already lack indigenous fossil fuel sources; and others like India, Pakistan and Bangladesh which are suffering from depleting indigenous energy sources are increasingly becoming dependent on energy import. In addition, with the increasing population of this part of the world, where poverty is rampant but growing industries keep on crying for energies; unleashing the true potentials of this region to meet the growing needs and aspirations of a quarter of the world's population, energy security is an irrefutable reality.

Owing to the same reason, though there has been concerns expressed by developmentalists and economists on the probable constraints that this region will likely face as a result of energy source depletion resulting in energy inavailability and energy supply interruption; relatively little attention has been devoted to the need to develop mid to long term energy resource management plans in the national and regional landscape of South Asia. As the South Asian states are the likely major players in global energy markets, it is time that increased sensitivities are attached to this issue of energy security and cooperation in South Asia.

In line with this, learning from Japan's experience would be worthwhile. Japan, the country with a limited resource base yet displaying surprising pace of growth, is one of the pioneers in energy governance. Tokyo has responded to its energy concerns by developing diverse sources and reinvigorating its diplomacy. Therefore, Japanese vast experience in energy sector can be a good learning for the South Asian region. This proposed conference holds ample opportunities to bring together experts on the subject, researchers, scholars, members of academia and policy-makers in a common platform for dialogues to learn from Japanese experience and explore further opportunities. It can further open up avenues for exchange of implementable ideas and can play a commendable role in undertaking regional projects and increasing policy level prioritisation of the issue among policy makers and practitioners.

Objectives

The project will have a number of objectives covering the core issues of energy security and cooperation.

- To review the current energy situation of this region as well as the obstacles governments confront in addressing them.
- To make some forecast of future demands.
- To envision exploring policy adjustments necessary for South Asian countries to adapt to new energy boom and develop this regions capability in terms of energy diplomacy.
- To find out deepening cooperation with energy exporting countries and required diplomatic ventures.
- To find out ways through which existing resources can be best and efficiently managed and share expertise of Japan's renewable energy development in a safe manner.
- To look into how countries of this region can share technological 'know-how' among themselves and also with Japan for dealing with the upcoming energy dilemma.
- To find out how regional cooperation can bring answer to energy problems.
- To provide concrete recommendations to respective governments of South Asia on various issues pertaining to energy.

Programme

**International Conference
on
Energy Security in South Asia Plus: Relevance of
Japanese Experience
28-29 October 2015**

Wednesday, 28 October 2015

1000 hours-1100 hours INAUGURAL SESSION

CHAIR : Ambassador Munshi Faiz Ahmad
Chairman, BOG, BISS

0955 hours : **Guests take seats**

1000 hours-1010 hours : **Address of Welcome**
Major General A K M Abdur Rahman, ndc, psc
Director General, BISS

1010 hours-1020 hours : **Address by the Special Guest**
H. E. Mr. Masato Watanabe
Ambassador of Japan to Bangladesh

1020 hours-1030 hours : **Address by the Special Guest**
Mr. Nasrul Hamid, MP
Honourable State Minister
Ministry of Power, Energy & Mineral
Resources
Government of the People's Republic
of Bangladesh

1030 hours-1050 hours : **Address by the Chief Guest**
Mr. Abul Hassan Mahmood Ali, MP
Honourable Foreign Minister
Government of the People's Republic
of Bangladesh

1050 hours-1100 hours : **Remarks by the Chair**
Ambassador Munshi Faiz Ahmad
Chairman, BOG, BISS

1100 hours-1130 hours : **Refreshment**

1130 HOURS-1320 HOURS : FIRST WORKING SESSION

CHAIR

Prof. Dr. Mohammad Tamim,
Head, Department of
Petroleum and Mineral Resources
Engineering, BUET

1130-1210 hours

Presentation of Papers

:

*Energy Security and Cooperation
in South Asia: Pivotal Roles of
North Eastern States,*

Professor Mahendra P

Lama, South Asian Economies,
School of International
Studies, Jawaharlal Nehru
University, New Delhi, India

*Japan's Experience in Energy
Security and Lesson Learnt*

Mr. Ichiro Kutani, Assistant
Director, Institute of Energy
Economics, Japan (IEEJ), Japan

1210 hours -1310 hours

: Open Discussion

1310 hours -1320 hours

: Concluding Remarks by the Chair

1320 hours -1430 hours

: Lunch

1430 HOURS-1630 HOURS : SECOND WORKING SESSION

CHAIR

Dr. Nurul Islam,
Former Professor, Institute of
Appropriate Technology (IAT)
BUET

**1430 hours -1530 hours :
Presentation of Papers**

*Connectivity for Energy:
Integrating Myanmar into South
Asian Energy Dynamics, **Mr. Pyi
Wa Tun,** Chief Executive Officer,
Parami Energy Group of
Companies, Yangon, Myanmar*

*South Asia Energy Market:
Prospects and Challenges
Mr. R. V. Shahi, Chairman,
Energy Infratech Pvt. Ltd. and
Former Secretary, Ministry of
Power, Government of India*

*Energy Diplomacy of Bangladesh:
Exploring Potentials,
**Major General A K M Abdur
Rahman, ndc, psc**
Director General, BIISS, Dhaka*

1530 hours -1620 hours : Open Discussion

1620 hours - 1630 hours : Concluding Remarks by the Chair

Thursday, 29 October 2015

0930 hours -1130 hours : THIRD WORKING SESSION

CHAIR

Dr. Ijaz Hossain, Professor,
Chemical Engineering Department,
BUET

0930 hours -1030 hours :

Presentation of Papers : *Energy Security in Nepali
Context: Internal Demand
and Power Export*, **Dr. Nishchal
N. Pandey**, Director, Centre
for South Asian Studies, Kathmandu,
Nepal

*Diversifying Energy Supply Sources:
It is High Time to Call for Renewables*,
Mr. Chatura Rodrigo, Research
Economist, Institute of Policy Studies
of Sri Lanka, Colombo, Sri Lanka

*Energy Security in South Asia:
Perspective from Bhutan*,
Mr. Kuenga Namgay, Executive
Director, Corporate Affairs Department,
Druk Green Power Corporation,
Thimphu, Bhutan

1030 hours -1110 hours : Open Discussion

1110 hours -1120 hours : Concluding Remarks by the Chair

1120 hours -1130 hours : Tea Break

1130 hours -1330 hours : FOURTH WORKING SESSION

CHAIR

Mr. Mohammad Mejbahuddin,
Senior Secretary, Economic
Relations Division, Ministry
of Finance, Government of the
People's Republic of Bangladesh

1130 hours -1230 hours :

Presentation of Papers :

*Managing Risks of Renewable
Energy (Hydro and Nuclear)
Sources in South Asia,*

Engineer Arshad H Abbasi,
Advisor, Sustainable Development
Policy Institute, Islamabad, Pakistan

*Regional Power Development:
Bangladesh Perspective*

Mr. Mohammad Hossain,
Director General, Power Cell,
Power Division, Ministry of Power,
Energy & Mineral Resources

*Energy Security from Electric
Power Supply Side: The
Relevance of Japanese
Experience for South Asia,*

Mr. Hirotaka Watanabe, Power
Sector Advisor, JICA

1230 hours -1320 hours: Open Discussion

1320 hours -1330 hours: Concluding Remarks by the Chair

1330 hours -1430 hours: Lunch

1430 hours -1545 hours : CONCLUDING SESSION

CHAIR : Ambassador Munshi Faiz Ahmad
Chairman, BOG, BISS

1430 hours-1450 hours : Presentation of Summary Proceedings

Major General A K M Abdur Rahman,ndc,psc
Director General
BISS

1450 hours-1500 hours : Address by the Special Guest

H. E. Mr. Masato Watanabe
Ambassador of Japan to Bangladesh

1500 hours-1515 hours : Address by the Special Guest

Mr. Md. Shahriar Alam, MP
Honourable State Minister
Ministry of Foreign Affairs
Government of the People's Republic
of Bangladesh

1515 hours -1535 hours : Address by the Chief Guest

Dr. Tawfiq-e-Elahi Chowdhury, BB
Adviser to the Honourable Prime Minister
Power, Energy & Mineral Resources
Affairs, Government of the People's
Republic of Bangladesh

1535 hours -1545 hours : Concluding Remarks by the Chair

Ambassador Munshi Faiz Ahmad
Chairman, BOG, BISS

1545 hours-1600 hours: Refreshment

Abstracts

Energy Security and Cooperation in South Asia: Pivotal Roles of North Eastern States

Mahendra P. Lama

The South Asian countries together possess vast stores of energy mostly in the form of water resources, oil, forest, coal and gas. However, these countries continue to be characterised by poor quality of energy infrastructure, skewed distribution and inaccessible and costly energy availability. These countries have remained largely energy importers and increasingly faced a serious energy shortfall. This is likely to deepen further both because of ongoing economic liberalisation-led activities and rise in income level-led steady switching over of the rural and urban families from bio-fuels to more efficient and convenient modern fuels. The inability to cater to the increasing industrial and other commercial energy needs have adversely affected their productive activities, social development and investment climate. This is exacerbated by structural, institutional and financial problems.

These countries have introduced massive reforms in the energy sector. This restructuring is aimed at making their utilities more efficient and financially viable. A large number of private sector investors have entered into the energy sector. At the same time, there has been realisation that availability and accessibility to energy can transform the quality of life and work substantially, help raise health and educational standards and retard rural-urban migration by enhancing the level and pace of income and employment generation.

There are clear options emerging. The cross border power trading is one of them with Bhutanese success story spreading to Nepal, Bangladesh and even Pakistan and also the noticeable seasonality factor in both generation and demand. There have been negotiations going on between India and the neighbouring countries on the possibility of power trading and bringing power from Central Asia and also gas pipeline from Iran and other Central Asian countries passing through Pakistan. Given the demand and supply situations in the sub-continent, it is rational to believe that the trade in power

and gas will be mutually beneficial in terms of both economic and political gains.

Economic gains based on regional cooperation in the energy sector have become a firmly established practice across the regional groupings. In recent years, three remarkable developments have been recorded in this sub-region consisting of Bangladesh, Bhutan, India and Nepal - also known as South Asia Growth Quadrangle (SAGQ) or BBIN initiative. This provides a new direction for future energy cooperation. The three very far reaching projects including in power exports, a grid interconnection and power generation are underway between India and Bangladesh. Secondly, the part export to Bangladesh from Palatana gas based power project in Tripura is another new model of cooperation.

NEEPCO projected that the hydel power potential of the NER is roughly 58900 MW (40% of the national potential) of which hardly 2.5% has been harnessed. Despite the highest hydro power potentials and huge deposits of crude and gas, the entire north-eastern state continue to remain power deficit. Besides effectively participating in the both energy production and trading within the country, the North East region could also act as major transit region for energy trading to the neighbouring countries including Bangladesh, Bhutan, China, Myanmar, Nepal and other South East Asian countries. This also opens huge opportunities for the investors from Japan and other South East and East Asian countries to make SAGQ and more so NER of India as a major investment destination. This is definitely going to supplement the Act East Policy of India.

And the third is the strong possibility of Bangladesh and other countries accessing power from third country like Bhutan using Indian transmission lines.

There are in fact large numbers of grid substations on both sides of the border where distance of interconnections between the two sides may be well within 20 to 60 kms. Some of these substations are so close that they could be interconnected at a very nominal cost and within a very brief time span to facilitate power trading.

Therefore, the primary idea should be to promote a quadrangular perspective. This will involve promoting and building

linkage and integration including through energy exchanges i) within a state, ii) among the north east states, iii) with the rest of India and iv) for cross border interactions. This will bring openness, reoriented thinking and varied opportunities for the people of the north east region. In such a situation, the very participation of a variety of development actors and investors including Japan will bring knowledge, larger choices in techniques of production and generation, newer work culture and modern institutional practices. This would induct fresh skills, newer capabilities, modern technologies and efficient management and governance practices. This will also inject a strong sense of human security that would ultimately ensure national security.

Japan's Experience in Energy Security and Lesson Learnt

Ichiro Kutani

After the Second World War, Japan has experienced three (3) major critical moments of energy policy. The first moment was just after the Second World War. The, so called, Preferential Production System was implemented which aims at effectively allocating limited resources such as material, human, and money for coal and iron & steel industries. In addition in a power sector, combination of nine (9) regional monopolistic private power company and national initiative for power grid and power plant development was largely contributed to accomplish development of sufficient electricity infrastructure in a country. The second moment was oil crises in 1970s. The crises made Japan aware for their vulnerable state of energy security which was heavily depended on oil and Middle East for her energy supply. The government enacted policies to diversify energy use (reduce dependence for oil) and improve energy efficiency which succeeded in creating diverse energy supply structure after that. The third moment was great earthquake in 2011. In addition to efforts for winning back people's trust for nuclear safety, restructuring of energy system, such as enhanced use of renewable energy and power market reform, is progressing which is expected to contribute to establish more robust and resilient system.

Influence of such recent restructuring of energy system in Japan can already be observed in some extent. For instance, electricity market reform (de-regulation) is already facing challenges

in its implementation. Private companies are quickly responding to the policy change and they plan to construct new coal-fired power plant that can compete against incumbent power company. But this trend is clearly inconsistent with another pillar of policy - climate policy.

When looking at Bangladesh, it is still low at electrification and gas supply rate for household, which means the country need large capital investment for next decade and after. Although a smooth financing is critical element of such investment, low average income level makes it difficult to recover a cost of investment through energy rate. When considering such challenges in Bangladesh and compare with experiences in Japan, following points may be suggested for strengthening energy security of Bangladesh.

1. Concentrate limited resources into a few key areas
 - Available resources (material, human, finance) are limited.
 - Need to select and focus on a few key areas to inject precious resources.
2. Public sector can play a leading role during developing period
 - Public sector can play an leading role when;
 - ✓ a country need immediate action in line with policy.
 - ✓ a country need large amount of investment, while private sector is in-mature to mobilise sufficient amount of capital to execute such investment.
3. Gradual reform of energy rate
 - Raise energy rate to 'cost plus' level which incentivise company and people for energy efficient behavior.
 - Cross-subsidy between rich and poor. (progressive type tariff)
 - Change from energy subsidy to direct subsidy for poor.
4. Pursue lower cost option of energy supply with consideration to environment

- Enhance development and utilise indigenous natural gas resource as long as it is cheaper than import.
- High efficiency coal-fired power plant.
- RE based distributed energy system in rural/remote area if it is economically rationale.
- Do not compare CAPEX but evaluate life-cycle cost which includes OPEX.

South Asia Energy Market: Prospects and Challenges

R.V. Shahi

Adequate and reliable electricity supply is crucial for sustained development of economy and also for improving social services. Electricity is not available to about 50% of the population (1.5 billion) of the South Asian region. Rural areas are particularly adversely affected, leading to poverty and health problems. Elimination of poverty and enhancement of quality of life of people with full opportunities for knowledge enhancement and proper health care should be the core objectives of developing Energy Market in South Asia. The following main ingredients should constitute and characterise the South Asian Energy Market:

- Energy Policies of the Governments in the Region will have compatibility with each other so as to enable and facilitate development of a matured Energy Market
- Cost effective and environmentally benign development of energy resources (coal, petroleum, water, nuclear, wind, solar etc.) in the region aimed at accelerated growth and enhanced per capita consumption.
- Strong and adequate infrastructure, including connectivity (road, pipeline, electricity transmission system, waterways, port etc.) which will promote and accelerate development of energy market.
- Development oriented Regulatory Framework in each coun-

try, with harmonious compatibility with each other.

- Bilateral, Sub Regional and Regional Institutional Mechanisms to orchestrate and harmonise various processes -- policies, practices, programmes and activities.

All the countries in the region are endowed with huge energy potentials on the one hand, and tremendous opportunities to enhance per capita consumption of energy on the other. One of the primary reasons of extreme poverty in many parts of all these countries is lack of access to commercial energy. In today's world, electricity and energy in general are needed not only for GDP growth but they have become essential for proper social sector services like health and education. Per capita consumption of electricity in the region varies from about 900 kwh in India to less than 100 kwh in Nepal. Even in India, in a few states, it is less than 100 kwh. For the region as a whole, it may not be more than about 550 kwh compared to global average of 2500 kwh. Resources are enormous. India has 285 billion tonnes of coal reserve; its present annual production is less than 600 million tonnes. It has more than 150 GW of Hydro Power potential, the capacity commissioned is 40 GW. Nepal has more than 100 GW- it may be even 200 GW as per some estimate) of Hydro Power potential, developed capacity is less than 1 GW. Thus, while huge energy potentials across the region have remained unharnessed, energy access to people has been so low that the region is faced with abject poverty for a large segment of population (perhaps the largest group of poor in the world). This is the greatest challenge for these governments. Hence, it offers the best opportunity to talk about, articulate and take forward the idea of South Asia Energy Market.

The need is there, natural resources are there, and, most likely, the market players along with financial resources could also come forward. But, it is the socio political and diplomatic complexities which have stood in the way so far and continue to do so and constrain this process. A few good examples of success achieved recently offer not only a ray of hope but also a few good lessons on how to address these challenges. These lessons, however, by no means, are exhaustive, may not apply in all situations and in all cases. Character of bilateral issues differ, nature of sub regional problems and considerations are different, and magnitude of challenge for overall regional integration of energy development

and trade has a different dimension. While there are differences in the nature of challenge, there are also some similarities. All these synthesised together may create a menu of optional strategies.

It is important to evolve approach and strategy aimed at achievement of the objective, viz. a full fledged energy market. Following underlying principles and considerations could guide this process:

- Full realisation of the Vision will be a long term goal of say 15 years. The short term (3-5 years), medium term (5-10 years) and long term (10-15 years). Approach may help in outlining or portraying the nature of different ingredients of energy market (refer the section on Components of Energy Market above).
- Road Maps for different countries, bilateral, sub regional and regional for each of the time frame (short, medium, long term) could be drawn which can guide in taking the process forward. From time to time these road maps may be reviewed based on ground realities.
- Policy advocacy at country level and regional level will be an important aspect of this initiative.
- An important contributor to this process would be properly structured Narrative, which will need to be dynamically reviewed, to be also used for advocacy.
- Informal and formal interactions with political system, bureaucracy and also NGO's in as well calibrated manner may prove quite effective.
- Role of multilateral agencies like the World Bank may be by way of providing inputs, including knowledge inputs, to catalyze the process, create awareness, and generate consensus. A policy statement highlighting long term commitment to finance infrastructure and energy projects, linked to regional energy market, can make a big difference.

Several efforts made in last few years have already started yielding results, and there are good success stories like Bhutan Hydro, Bhutan-India Transmission, Bangladesh Cross Border Transmission and CASA Project etc. In the short term time frame (3-5 years), the following could be targeted:

- Immediate expansion of 500 MW HVDC System of Bangladesh - already started.
- Further Bangladesh - India Transmission Links including one at Palatana-already started.
- Mega scale Transmission from North East India via Bangladesh
- A few Sub Regional Projects involving India, Bangladesh, Bhutan and Nepal
- Development of a few large domestic cum export Large Hydro Projects in Nepal
- A few strong 400 KV Transmission systems between India and Nepal
- A few 132 KV Transmission Links between India and Nepal - low hanging fruit
- India Bangladesh JV Hydro Projects
- India-Pakistan Transmission system and supply of at least 500 MW power
- Larger Transmission Links between India and Pakistan.
- Transmission Link between India and Sri Lanka.
- JV for Hydro Projects in Bhutan and Stronger Transmission Links.
- interactions among sub regional group to arrive at a Framework Agreement
- Policy changes in different countries- Enabling Framework for Power Market
- Gas Pipeline connectivity between India and other countries
- Policy Framework on Regional Gas Grid.

Energy Diplomacy of Bangladesh: Exploring Potentials

A K M Abdur Rahman

Energy is the life line of modern civilization. It is the key to economic progress and development. Access to power and energy open better chances for new businesses, increasing incomes and socio-economic development. Due to notable economic development, Bangladesh has already experienced rapidly rising energy utilisation over the past two decades. Since many development initiatives have launched, it is expected that the rising demand of energy consumption will accelerate further in the coming years. To continue a sustainable growth rate, the country will need uninterrupted external sources to secure continuous energy inflow in its economic activities. Bangladesh's energy basket is made of natural gas, furnace oil, coal, diesel, hydro and imported power. Of them, natural gas is the main source of generating electricity. Currently, Bangladesh's fuel mix of power generation according to the power division is as follows; natural gas (62%), furnace oil (21%), diesel (8%), power import (5%), coal (2%) and hydro (2%). In 1995, the per capita energy consumption was 130 kgoe, average GDP growth was 4% while in 2014-15, the per capita energy consumption is 240 kgoe with the average GDP growth of 6%. It took almost 20 years to increase the growth rate by 2%. Thus, it is easily understandable that the country needs quantum of energy required feed the economy and its growth.

Currently, around 70% of the country's total power generation is dependent on local energy sources where as rest of the demand (almost 27%) meets up by expensive imported fuel oil. Therefore, Bangladesh needs a planned diplomatic maneuvering to ensure uninterrupted energy inflow in its enlarging economic and development activities. However, the idea of energy diplomacy covers a wide range of issues like the goals, actors, levels and focused areas to ensure uninterrupted energy supply. The periphery of energy diplomacy includes bilateral cooperation, regional and international cooperation. Again, the focus of energy diplomacy and approaches are not same for every country. In the context of Bangladesh, energy diplomacy means its diplomatic maneuvering to import energy and energy technologies to fulfill its domestic needs. Energy diplomacy of Bangladesh mainly covers establishing strong bilateral relations

with energy rich countries and promoting sustainable cooperation in the regional level. The objective of present paper is to look at the bilateral diplomatic efforts of Bangladesh to import energy and the regional arrangements where the country wants to pursue sustainable energy supply in the region. The paper discusses the diplomatic maneuverings of Bangladesh to import electricity, natural gas, liquefied natural gas, coal, hydropower, and fuel oil as well as to invite foreign investments to build new coal terminals, coal-based power plants, importing of coal, liquefied natural gas, natural gas in pipeline, fuel oil, establishing nuclear power plant, generating nuclear-based electricity and seeking partnership for hydropower etc. The paper also tries to explore potentials where Bangladesh can be more active to attain the goals of its energy diplomacy.

Energy Security in South Asia: A Nepalese Perspective

Nishchal N. Pandey

Although possessing 83 thousand megawatts of unharnessed hydro-power, Nepal can be termed as the most energy insecure nation of South Asia. Power outage is common, irregular supply of petroleum products and gas coupled with the low level of development of alternative sources of energy such as solar, wind and biogas has taken a heavy toll on the economy of Nepal. Being a land-locked country with difficult topography, Nepal is also heavily reliant on air services for swift delivery of essential goods to the mountain districts. There have been efforts to mitigate these challenges by inviting multi-national companies for constructing hydro-dams but these have been controversial politically, financially expensive and environmentally unfriendly. India remains a monophony buyer of our power as FDI usually is tied with the fact that easy access to the Indian market be ensured which has most of the times been uneasy. Only with easy connectivity with the wider sub-region of India, Bangladesh, China, swift construction of transmission lines and a changed mind-set among officials and politicians can Nepal hope to be secured as far as energy is concerned.

Diversifying Energy Supply Sources: It is High Time to Call for Renewables

Chatura Rodrigo

Economic and population growth in South Asia have resulted in rapid increases in energy consumption in recent years. This is well above rate that has been observed in the OECD. South Asia's primary energy consumption showed an increase of 52 percent between 1993 and 2003, and the trend continues. Despite this growth in energy demand, however, South Asia continues to average among the lowest levels of per capita energy consumption in the world. At the same time, they are among the highest levels of energy consumption per unit of GDP. South Asia's commercial energy mix is mainly comprised of coal, petroleum, natural gas, hydroelectricity, nuclear and other. However, there are variations, for example, Bangladesh is mainly dependent on natural gases while India is predominately dependent upon coal.

Most of South Asia is already grappling with energy shortfalls, typically in the form of recurrent, costly, and widespread electricity supply charges. Because of the economic and political consequences arising from such shortfalls, improving the supply of energy, particularly the supply of electricity, is an important priority of national and local governments of the South Asian countries. Another repercussion of rising energy demand in South Asia is its impact on the region's level of carbon dioxide emissions. Therefore, the countries of South Asia are continuously looking ways to diversify their traditional energy supplies towards renewable energy sources, promote additional foreign investment for energy infrastructure development, improve energy efficiency, reform and privatise energy sectors, and promote and expand regional energy trade and investment. However, many barriers exist in achieving these objectives.

Large unexploited hydro power resources are there in India, Pakistan, Nepal and Bhutan. For example, more than 100GW of hydro potential in Bhutan and Nepal are waiting to be tapped. This is, however, only a fraction of the total hydro potential of the region, which is approximately 350GW. There are healthy reserves of wind power resources in India and Sri Lanka. However, production charges, capital investments in exploration, transaction costs involved

in technology transfers and opportunity cost of implementing sustainable and environmental friendly energy exploration and impacts of climate change has limited the use of these untapped sources. Therefore, collective models are needed by the countries to transfer necessary technologies and implement ways of cross-border energy trade. More collaborative research is called for in identifying potentials of untapped energy sources, inter and intra generational sustainability of energy extraction and impacts of climate change.

Energy Security in South Asia: Perspective from Bhutan

Kuenga Namgay

Energy security is the ability to secure sustainable energy supplies at reasonable price. The energy security situation is especially acute for South Asian nations, where energy sectors must typically grow by over 3% annually simply to sustain the economy. Each country in the region must therefore address critical energy concerns that will determine not only its national economic expansion plans, but also its ability to bring underserved rural populations onto the grid and into the economy.

The presentation shall cover only the energy from renewable hydropower resource. Hydropower potential represents one of the largest energy resources in the region, with the potential of India about 150,000 MW, Nepal about 80,000 MW, Pakistan about 40,000 MW, Bhutan about 30,000 MW, Sri Lanka about 2,000 MW and Bangladesh about 800 MW, totaling about 302,800MW of which only about 16% has been exploited thus far.

Except for Bhutan, all the countries in South Asia are energy deficit with the gap between the supply and demand on an ever increasing trend. For Bhutan too, while the installed capacity far exceeds the domestic demand, the supply at times falls short of demand during the winter peak hours.

One way to close the energy supply demand gap is to accelerate hydropower development, specially the reservoir schemes to its full potential. The other way to provide energy security is to establish regional trade in energy by establishing the regional electricity grid, which is practically non-existent in South Asia as of today, with

the exception of small pockets of bilateral power exchanges between Nepal, Bhutan, and India. The organizations like the SAARC Energy Center (SENTER) and the South Asia Regional Initiative (SARI) are active on this matter but could still do more on this front.

Managing Risks of Renewable Energy (Hydro and Nuclear) Sources in South Asia

Arshad H. Abbasi, Maariyah Wasim, Omama Tahir

Energy is the driving force for any growing economy. To achieve sustainable growth, diversification of energy mix is essential. Gradual increase in the per capita GDP has been observed from 2014 to 2015, USD 1,110 and USD 1,235 respectively. The GNI per capita has also improved 11% as compared to the previous year. The increasing trend of GDP and GNI suggest the growth of Bangladesh's economy. This booming economy of the country might take it to the middle income status.

Energy demand increases as economic growth accelerates. Bangladesh needs to address its Energy Security to attain the goal of becoming the lower-middle income country by 2021. Bangladesh is compelled to look forward to other countries due to the lack of indigenous resources and hence relies heavily on imported fuel. This paper intends to build a strategy to increase Energy Security of the country in consideration with its geo-political position and propose policies that could further strengthen the regional Cooperation.

Natural Gas reserves in Bangladesh are depleting as almost 62.5% of the Installed Capacity is based on Natural Gas. Therefore, over-dependence of natural gas must be reduced by focusing more towards hydro which is one of the cheapest forms of electricity. Nepal, having a huge hydro potential, is separated from Bangladesh through short distanced Siliguri corridor. Development of HVDC transmission network in this corridor can help Bangladesh fulfill its energy needs and prevent floods while creating a lot of job opportunities in Nepal, further leading towards huge developments. Meanwhile, India could support the two countries by providing transit route, creating a Win-Win-Win situation for the three countries. Also, Myanmar that shares a border with Bangladesh can help overcome its prevailing energy crisis.

However, hydro cannot provide base load for which hybrid nuclear can be chosen to variegate the Energy Mix. Having a capacity factor of more than 90%, it is a reliable source that can be used for the base load. Moreover, being clean energy it poses no hazard to the environment. Nuclear energy is successfully being used by many countries for generating electricity and the technology can be transferred to Bangladesh.

Despite of the fact that solar is being used, it has a very low capacity factor that makes it an expensive source of energy. Moreover, it cannot be used for operating the turbines and consequently the industrial sector. Therefore, such renewable sources can only be exploited for electrification purposes. Otherwise, solar does not fulfill the needs on the large scale. Apart from generation of the electricity, its distribution is another concern. To safely distribute electricity with minimum losses, load centers can be set up to ensure maximum distribution. Thus, intelligently combining hydro and nuclear and wisely using the techniques of optimising energy supply, sustainable economic growth can be achieved.

Regional Power Development: Bangladesh Perspective

Mohammad Hossain

Power is the key ingredient and engine of growth for economic development and upliftment of human life style. The vision of the present Government is to provide quality electricity at an affordable price for all by 2021. In order to fulfill the vision, the government has prepared short, medium and long term power generation plan. The government has been very much successful in meeting the target using conventional, indigenous and renewable energy resources. Presently, the generation capacity has been elevated to more than 11000 MW from less than 5000 MW in 2009. Access to electricity has been raised to 74% from 47%. Still Bangladesh has a long way to go. It has to generate about 40,000 MW by the year 2030. Primary fuel has become a major challenge to fulfill this target. Before 2009, about 90% of the generation came from gas which is now below 70% due to the gradual depletion of domestic gas resource. Next base load option is coal which has a number of challenges including global

concern on environment, extraction of domestic coal and sourcing and handling of importing coal. On the other hand, limited potential of renewable sources cannot be considered for base load. However, the government has to ensure clean electricity for the emerging need for growing economic development. South Asia region has a hydro power potential of about 350 GW while only less than 10% of it could be harnessed. The region could have a sustainable power sector if this huge potential could be harnessed. After the adoption of SAARC Framework Agreement on Electricity in the last SAARC Summit, the door for regional cooperation in electricity has been opened up. This cooperation does not mean that one will be an importing country and the other will be exporting country only. Due to the seasonal diversity as well as the fuel mix diversity most of the countries could be an importer as well as an exporter in different time of the year. This would allow the member states to go for regional power trade on a win- win situation. Bangladesh could play a vital role for electricity trade due to its geo-political standing and also can meet its power demand through regional cooperation.

Energy Security from Electric Power Supply Side: The Relevance of Japanese Experience for South Asia

Hirotaaka Watanabe

Electric power itself is important energy. Electric power can be used for various kinds of purposes, motive power, heat, electronics, etc. Electric power can be generated using various kinds of primary energy. Electric power must always be supplied to meet the demand. Imbalance of supply and demand makes Electric Power Systems unstable. Energy security from electric power supply side means the prevention of large scale blackout all the time. Engineers of electric power utilities of all over the world always try to do our best to prevent the large scale blackout. This is the nature of us. In Japan, electric power utilities experienced some turning points of primary energy use for generation. Engineers made efforts to realise Optimal Mixture (Best Mix) of energy for generation in these cases. R&D to keep Energy Security is also important for stable electric power supply. JICA would like to support South Asian countries for Energy Security from electric power supply side.

Brief Profile of the Participants

Dr. Mahendra P. Lama is Professor of South Asian Economies in the School of International Studies in Jawaharlal Nehru University, New Delhi. He was the Pro Vice Chancellor of Indira Gandhi National Open University (IGNOU), New Delhi and was also the Founding Vice Chancellor of the Central University of Sikkim in India. He was also a Member of the prestigious National Security Advisory Board of Government of India. He is presently nominated by the Government of India as a member of the Steering Committee of the coveted South Asian Forum set up by the Heads of the States and Governments in the 16th SAARC Summit in Thimphu in 2010. He served as the Chief Economic Adviser in the Government of Sikkim with a Cabinet Minister Rank for seven years (2000-2007).

Central to his intellectual pursuits is development, cooperation and integration in South and South East Asia and North East region and hills and mountain areas of India. While teaching economic cooperation and integration in South Asia and India's Foreign Economic Policy, he does extensive research with distinct policy slants on cross border issues. He has closely worked with the top regional institutions in South Asia including the Bangladesh Institute of International and Strategic Studies (BIISS-Dhaka), Bangladesh Institute of Development Studies (BIDS-Dhaka), Centre for Policy Dialogue (CPD), and Bangladesh Unnayan Parishad (BUP-Dhaka); Pakistan Institute of Development Economics (PIDE-Islamabad); Institute of Integrated Development Studies (IIDS-Kathmandu); Institute of Policy Studies (IPS-Colombo), International Centre for Ethnic Studies (ICES-Kandy) and Regional Centre for Strategic Studies (RCSS-Colombo) and Centre for Bhutan Studies (CBS-Thimphu).

Besides authoring and editing 22 books, he has extensively worked on the issues of energy, trade, investment and energy cooperation, sustainable development and human security in South Asia. His works have been published in many refereed journals and also translated into a number of foreign languages including Japanese, French and German. His most recent work is a book entitled "Human Security in India: Discourse, Practices and Policy Implications" (UPL, Dhaka, 2010). He regularly writes in prominent national dailies in India and South Asia including *Hindu*, *Hindustan Times*, *Times of India*, *Telegraph*, *Statesman*, *Deccan*

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Mr. Ichiro Kutani is Assistant Director, Strategy Research Unit, Institute of Energy Economics, Japan (IEEJ), Japan. Mr. Kutani has been engaged in energy policy analysis since joining IEEJ in 2007. His main field of research is analysis of global energy market and energy security issues with emphasis on Asia. The latest study project engagement includes ASEAN power grid connectivity, energy efficiency in the transport sector, quantitative assessment of energy security policy, and development of energy master plan for Ukraine. Prior to his current role, Mr. Kutani has held positions of Leader of Gas Group, and Visiting Researcher at IEEJ, where his research has addressed US, European, and Asian gas and LNG markets, global coal markets and clean coal technology. Mr. Kutani began his career at JFE Engineering Corp where he designed and managed gas pipeline projects. He holds a Master's Degree in Mechanical Engineering from Waseda University, Japan. His e-mail address is: ichiro.kutani@tky.ieej.or.jp

Mr. Pyi Wa Tun is the Chairman and Chief Executive Officer of Parami Energy Group of Myanmar. The group is involved in Oil and Gas, Power, Construction and Insurance. He received his MBA degree from the National University of Singapore and Bachelor of Engineering degree from Yangon Institute of Technology. Under his capacity as the Chief Executive Officer of Parami Energy Group, he initiated programmes to support one third of 1600 Monastic schools in Myanmar and to plant 500,000 trees by 2015. He was honoured as Young Global Leader by World Economic Forum in 2014. He can be reached at: ken@parami.biz

Mr. R. V. Shahi is the Chairman of Energy Infratech Private Limited. He held the position of Secretary to the Government of India, Ministry of Power for nearly five years from April 2002 to January 2007. In this position, he was responsible for policy initiatives and implementation for the entire Power Sector (1,68,000 MW capacity) in India. During his tenure, the Indian Power Sector went through a major restructuring with the institution of the Electricity Act, 2003 and subsequent National Electricity Policy, 2005 and National Tariff Policy, 2006. Other major initiatives launched include the Accelerated Power Development & Reform Programme (2002), Rural Electrification Policy (2005), Ultra Mega Power Policy (2006) and Merchant Power Policy (2006).

Mr. Shahi was also directly responsible for the long-term planning and operational performance of the Central Public Sector Undertakings viz. National Thermal Power Corporation (NTPC), Power Grid Corporation of India Ltd, National Hydroelectric Power Corporation, Satluj Jal Vidyut Nigam Ltd, Tehri Hydro Development Corporation, Power Finance Corporation, Rural Electrification Corporation, Bhakra Beas Management Board and Damodar Valley Corporation. He was also President of the Governing Council of Central Power Research Institute, Chairman of the Executive Committee of Bureau of Energy Efficiency and Chairman of the Governing Council of National Power Training Institute having 5 large Training Institutes in various parts of the country.

Mr. Shahi's academic qualifications include Graduation (Mechanical Engineering), Post Graduation (Industrial Engineering), Post Graduation (Business Management) and Diploma in Advanced Industrial Management (Delft, Holland). He is a Fellow of the World Academy of Productivity Sciences. He is a Fellow of Institution of Engineers (India), a Fellow of International Institute of Electrical Engineers, and a Fellow of the Indian National Academy of Engineering.

Mr. Shahi was Chairman or Member on Boards of various companies, as also in the Audit Committees of the Boards, during different periods (1991-2002), including member on the Board and Audit Committee of Power Grid Corporation of India. He was Chairman of World Energy Council-Indian Member Committee (WEC-IMC) during April, 2002 to January, 2007; Member (2003-2006) on the Policy Group of Carbon Sequestration Leadership Forum (CSLF), a US led global initiative; Member (2005- 2006) on the Govt. Steering Committee for the US led global initiative on Zero Emission Future Generation Project. He has been closely associated with industry bodies such as Confederation of Indian Industries (CII), Federation of Indian Chamber of Commerce & Industries (FICCI), Associated Chamber of Commerce and Industry of India (ASSOCHAM) as Member or Chairman of various Committees. He was also a member on more than sixteen Committees and Organisations covering diverse topics related to Energy, Environment, Human Resource Development and Education. In 2006, he was made Chairman of the Government of India's Working Group on Power for Eleventh Five Year Plan (2007-12). He is on the Boards of Governors of Indian Institute of Management (IIM) Lucknow, Management Development Institute (MDI) Gurgaon, and Xavier Institute of Management, Bhubaneswar. Mr. R. V.

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Major General AKM Abdur Rahman, ndc, psc is the Director General of Bangladesh Institute of International and Strategic Studies (BIISS). He was commissioned in the Corps of Infantry on 10 June 1983 with 8 BMA Long course. Beside his regimental appointments as Adjutant, Company Commander and Second in Command in five different infantry units, he commanded an infantry battalion both in plain and in Chittagong Hill Tracts (CHT). He commanded an infantry brigade and had been Commandant of NCO Academy. Major General Abdur Rahman served as the Grade Two Staff Officer in the Military Operation Directorate in the Army Headquarters and Colonel Staff in an infantry Division. He also served in the Special Security Forces (SSF) as the Director of Training. He is a distinguished instructor and served as Instructor Class Three in the Military Police School, Class Two Instructor and Platoon/Term Commander in Bangladesh Military Academy, Instructor Class One and Directing Staff in the School of Infantry and Tactics as well as Defence Services Command and Staff College (DSCSC). He served as the Military Secretary of Bangladesh Army in the Army Headquarters, Senior Directing Staff in National Defence College.

Major General Abdur Rahman attended 17 professional courses both at home and abroad. He is a graduate of NDC and DSCSC, Bangladesh and obtained his Master of Defence Studies from National University of Bangladesh. He is also a graduate of Malaysian Armed Forces Staff College and obtained Post Graduation Diploma (with Credit) on Strategic and Defence Studies from University Malaya, Kuala Lumpur, Malaysia. He attended and participated in the 'United States Pacific Command International Military Operations and Law Conference' in New Zealand in 2009 and 'Senior Crisis Management Seminar' in USA in 2013. Major General Abdur Rahman is one of the 15 pioneer military officers of Bangladesh Army who served the United Nations Missions participated by Bangladesh for the first time. He served as UN Military Observer in 1988 in Iraq (UNIIMOG) and Force Provost Marshal in UN mission in Congo (MONUC) in 2006. He received the commendation of the Force Commander from both the UN missions he served. He sustained bullet injury during counter insurgency operation in the CHT and was awarded with the 'Major War Injury Stripe (Golden Injury)' by the Government of Bangladesh. Major General Rahman's e-mail address is: dgbiiss@biiss.org

Dr. Nishchal N. Pandey is Director of the Centre for South Asian Studies (CSAS), a premier think-tank of Nepal. He was Executive Director of the Institute of Foreign Affairs (IFA) under the Ministry of Foreign Affairs where he worked for 8 years (1998-2006). He is PhD in Political Science from Tribhuvan University, Kathmandu. He was also Advisor to the National Planning Commission for the tourism and civil aviation sectors in 1996-97. He was task force member to draft the ninth five year plan of Nepal Government.

A man of letters, he is author of 3 books published by SAGE and Manohar Publishers, New Delhi. Dr. Pandey was Visiting Research Fellow at the Institute of South Asian Studies (ISAS), National University of Singapore in 2006-07 and visiting fellow at the University of Hull, UK in 2009. In September 2013, he was visiting fellow at the Stiftung Wissenschaft und Politik (SWP), a leading think-tank in Berlin, Germany. Dr. Pandey has edited a number of books. His latest edited book is “Realizing the Vision of a South Asian Union”-(CSAS-KAS, 2014). He is author of dozens of research papers and articles that have been published in internationally reputed journals, newspapers and magazines. In the recent years, he has written extensively on the need of increasing connectivity in South Asia. Dr. Pandey is currently a board member of the Regional Centre for Strategic Studies (RCSS), Colombo. Pandey also teaches at the department of conflict, peace and development studies under the Tribhuvan University. A well known strategic analyst of Nepal, his comments and interviews are regularly published in international newsmagazines and telecast in TV channels. He can be reached at: nina@ntc.net.np or pandeynishchal@hotmail.com

Mr. Chatura Rodrigo is an Economist with research interests in environment and natural resource economics, food and agriculture economics, and international trade. He holds a BSc in Agricultural Economics and an MSc in Environment Economics from the University of Peradeniya, an MSc in Financial Economics from the University of Colombo, an MSc in Food Agriculture and Resource Economics from the University of Guelph, Canada. Chatura Rodrigo is a PhD candidate (Joint PhD) from the universities of Colombo and Guelph, Canada. His email address is chatura@ips.lk

Mr. Kuenga Namgay is Executive Director, Corporate Affairs Department, Druk Green Power Corporation, Thimphu, Bhutan. He has a Bachelor’s Degree in Mechanical Engineering from Aligarh Muslim

University, UP, India and a Master's Degree in Mechanical Engineering from Toyohashi University of Technology, Aichi, Japan.

He joined service as an Assistant Engineer in the 336MW Chhukha Hydro Power Corporation (CHPC) in 1991. CHPC was in 2008 amalgamated into Druk Green Power Corporation (DGPC) along with three other hydropower plants. In his career spanning about 24 years, he has served the company in all aspects of operation and maintenance activities.

Kuenga Namgay was the Chief Executive Officer of 126MW Dagachhu Hydro Power Corporation (DHPC), a subsidiary company of DGPC, from 2007 to 2009. DHPC is the first PPP hydropower project in Bhutan and also the first cross border CDM project. From 2010 to 2013, he served as the Executive Director in the Empowered Joint Group (EJG) Secretariat under the Ministry of Economic Affairs, Royal Government of Bhutan. The EJG is a committee of very senior officials from the Royal Government of Bhutan and Government of India to accelerate hydropower development in Bhutan. He has been transferred back to DGPC in June 2013 where he is heading the Corporate Affairs Department as an Executive Director. His e-mail address is: edcad@drukgreen.com

Mr. Arshad H. Abbasi, Advisor, Sustainable Development Policy Institute (SDPI), Islamabad, Pakistan is a water and energy expert with extensive experience of working in the Development, Water and Energy Sector. His technical and analytical skills enable him to manage and solve complex and complicated research and policy problems. Moreover, his key competencies and working strengths include Strategic Planning, Energy Policy, Energy Regulation, Energy Audit and Management, Project Control, Planning & Scheduling, Cost Engineering, Monitoring and Post Project Evaluation, Contract Strategy & Documentation, Dispute Resolution, Benchmarking & Performance Measurement, And Knowledge & Information Management.

Having graduated from the Engineering University, Lahore in 1990 and Masters in Engineering Management from the Center for Advanced Studies in Engineering, he has served in various public sector organisations, including Planning Commission of Pakistan, Etisalat – UAE, PTC, NESPAK, PTCL, and PTA as Infrastructure Development Specialist. He has also served in various International Organisations such

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Mr. Mohammad Hossain is the Director General of Power Cell, a technical arm of Power Division, Ministry of Power, Energy & Mineral Resources. During the 27 years of professional experiences, he served in a number of organisations in different capacities. He is a professional leader and was the Secretary, Institution of Engineers, Bangladesh (IEB), Dhaka Centre. He has visited more than 25 countries for professional purposes. Mr. Hossain is a member of Joint Steering Committee (JSC) for Bangladesh-India Cooperation in Power Sector. He led the Joint Working Group (JWG) for Renewable Energy (RE) Cooperation between Bangladesh and India. He is a Member of the Governing Board (GB) from Bangladesh in SAARC Energy Centre (SEC). He is also a member of the Taskforce for Policy & Legal Issue of South Asia Regional Initiative/ Energy (SARI/E), member of the D-8 Working Group on RE. He is a Member of Expert Group on Energy in UN-ESCAP. Mr. Mohammad Hossain graduated from Bangladesh University of Engineering and Technology (BUET). He obtained his MBA from IBA, Dhaka University. He also obtained post graduate diploma in IHRD from Denmark. He has attended various training courses on Power Sector at home and abroad. He also presented papers in national and international seminars and workshops at home and abroad. A good number of technical papers of Mr. Hossain have been published in the national and international publications. His e-mail address is: mhossain@powercell.gov.bd

Mr. Hirotaka Watanabe is the Power Sector Advisor, Japan International Cooperation Agency (JICA). Born in Tokyo, Japan in 1961, he received bachelor of electrical engineering at University of Tokyo. He joined Tokyo Electric Power Company (TEPCO) in 1984. He worked for construction, operation, and maintenance of hydropower stations, research of new technologies, and overseas work as electrical engineer for 30 years in TEPCO. Since 2014, he has been dispatched to Dhaka as JICA power sector advisor in power division, ministry of power, energy and mineral resources. He is a registered professional engineer (electric & electronics) of Japan. His e-mail address is: dhaka-nabe@mbr.nifty.com

About The Japan Foundation

The Japan Foundation was established in 1972 as a special legal entity supervised by the Foreign Ministry to undertake international cultural exchange and was subsequently reorganised as an independent administrative institution in October 2003. The Japan Foundation consists of a head office in Tokyo, a branch office in Kyoto, two Japanese-language institutes (Urawa and Kansai), and 22 overseas offices in 21 countries.

Purpose

The purpose of the Japan Foundation is “to contribute to a better international environment and to the maintenance and development of harmonious foreign relationships with Japan, through deepening other nations’ understanding of Japan, promoting better mutual understanding among nations, encouraging friendship and goodwill among the peoples of the world, and contributing to the world in culture and other fields through the efficient and comprehensive implementation of international cultural exchange activities. (Independent Administrative Institution Japan Foundation Law, Article 3).

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The Japan foundation carries out its programmes and activities in the following three major categories:

- i Arts and Cultural Exchange
- ii. Japanese-Language Education Overseas
- iii. Japanese Studies and Intellectual Exchange

Each programme within these categories supports international exchange activities by individuals and organisations. The Japan Foundation also plans and stages events and provides continuous support for universities and other organisations overseas. Provision of information obtained through research is another activity of the Japan Foundation.

The Japan Foundation Information Center (JFIC) provides information on international cultural exchange through media such as its website (<http://www.jpf.go.jp/e/index.html>) and the periodical *Wochi Kochi*, and through the JFIC Library.



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