

ENERGY & POWER



The Fuel of Choice

- A Review on Energy Budget
- Revised PSMP: Let's Hope For The Best
- Land for Big Infrastructure Needs Govt Guarantee

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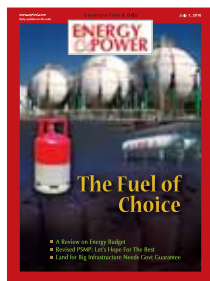
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43

The government will have to ensure availability of land for all large infrastructure projects, including energy sector ones -- be it in the public sector or private. The implementation of any large project in future will become impossible if there is any withdrawal after starting. Executive Director of Policy Research Institute Dr Ahsan H Mansur said this while talking to EP...



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EDITORIAL

Gas supply crisis is worsening day by day as the natural gas reserve in Bangladesh is depleting fast. At the present rate of use, the remaining recoverable reserve may completely deplete in about a decade. Major depletion has already started. The crisis is disrupting power generation, fertilizer production and operation of industries. There is no visible respite in near future. The initiatives of exploration and development of new gas resources and import of LNG may not bring any significant impact in less than 3-5 years. Crisis may start deepening as early as 2019. The policy for rationalizing gas use to value added purposes must be launched with immediate effect. Bangladesh can no longer afford using valuable gas resources for less valued sectors like domestic, commercial, CNG and captive power generation. Even fuel, other than natural gas, like coal and liquid fuel should be used for power generation as much as practicable. LPG must be preferred fuel of choice and LPG business must be regulated for pricing, safety and use of standardized bottles and appliances.

h i g h l i g h t s



15

The government in its past term since 2009 had inherited a power and energy sector with a chronic crisis of huge deficit. The power load shedding and energy shortages almost brought the economic activities to a standstill situation. The government had been left with little other choice than to take up crisis management contingency action plan. By 2016, the situation has been brought under reasonable control through...

COVER



9

The finite reserve of discovered natural gas in Bangladesh is fast depleting. Chronic crisis of gas supply is impacting upon power generation, fertilizer production, and operation of industries. There is perhaps no respite in the foreseeable future. The present initiatives of exploration and development of new gas resources and import of LNG may not bring any significant impact in less than 3-5 years. At the present rate of use, the remaining recoverable reserve may completely deplete in about a decade. Major depletion has already started...



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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.

Content

- 29** World Bank Helps Spread Solar Home Systems in Bangladesh
- 31** Remote Islands to Get Solar Mini-Grids
- 32** Average Costs for Solar & Wind Electricity Could Fall 59% by 2025
- 32** Solar Energy Sector Could Create 7,300 Jobs



Content

- 5** **WORLD WATCH**
Latest Development in World
- 6,7** **SNAPSHOT**
Latest Development
- 9** **COVER**
The Fuel of Choice
- 15** **SPECIAL ARTICLE**
A Review on Energy Budget
- 19** **SPECIAL REPORT**
Siemens, Gamesa to Merge Wind Businesses
- REPORT**
- 17** Riyadh Agrees to Invest Petro-Fund in Mega Projects in Bangladesh
- 20** 1320MW Coal Power Plant of SS Power Gets Environment Clearance
- 21** Joint Body to Set Terms for JV With Gazprom
- 23** Muhith: Power Generation in Rooppur Plant to be Costly
- 24** Rooppur Nuclear Plant Gets Site Licence to Start Work
- 25** ECNEC Approves Tk 12.78b
- Power Line Expansion Project**
- 27** Siemens Wins 130m Euro Order for India-Bangladesh Power Link
- 28** Gazprom Eyes Bigger Share in India
- ARTICLE**
- 35** Suitable Coal Mining Method for Bangladesh
- 36** How a Coal Power Plant Works?
- CLIMATE**
- 37** 3R Strategy for Waste Management
- 37** Scientists Turn CO₂ into Stone to Fight Climate Change
- 38** Climate Change Triggers Drought, Flood in Barind Tract
- COLUMN**
- 41** Revised PSMP: Let's Hope for The Best
- INTERVIEW**
- 43** Dr Ahsan H Mansur, Executive Director, Policy Research Institute

Russia Unveils World's Most Powerful Nuclear Icebreaker

Russia has launched the world's largest nuclear icebreaker- Arktika.

The vessel was designed and prepared as per the directives of the Russian state nuclear agency Rosatom.

Rosatom is also engaged in Bangladesh to build a 2400 MW nuclear power plant in Rooppur in the northern district Pabna.

The vessel is 189.5 yards long and 37.1 yards wide and is fitted with two designed RITM-200 nuclear-power reactors.

The maximum thickness of solid ice the icebreaker can overcome is 2.9 meters.

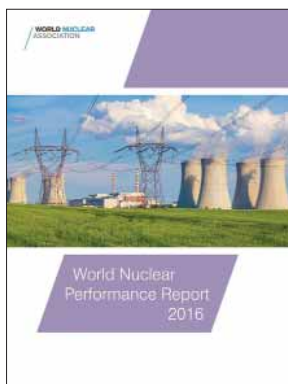
The universal nuclear icebreaker will support all-year-round navigation along the entire Northern Sea Route, and delivery of hydrocarbons to the Asia Pacific markets.



The launching ceremony of Arktika took place at the Baltic Shipyard in St. Petersburg in Russia on June 16.

World Nuclear Performance Report 2016 Launched

The World Nuclear Association



launched its annual report providing key metrics on nuclear power plant performance and reviewing recent developments in the global nuclear industry.

More nuclear reactors are under construction and more reactors came on line last year than at any time in the last 25 years.

Nuclear reactor performance has improved steadily over the last 35 years. Importantly, reactor

performance is not fundamentally affected by reactor age; older plants operate as well as younger plants.

Construction times for new reactors have improved over the last 15 years, with reactors coming on line in 2015 having an average construction time of around six years.

Speaking at the launch of the report Agneta Rising said, "This report shows that, despite challenging market conditions in some regions, existing nuclear plant performance is strong and the pace of new build is accelerating."

Siemens CEO Says Not Interested in Robot Maker Kuka

Siemens has no interest in becoming a white knight for German robot maker Kuka, which is the target of a 4.5

billion euro (\$5.06 billion) takeover bid by Chinese home appliance maker Midea, Siemens' chief executive said.

"If we had been interested, we would have acted on it some time ago," Joe Kaeser told German broadcaster ntv in an interview recently.

Midea's bid has fanned a furious debate over Chinese takeovers in Europe, with politicians such as German Economy Minister Sigmar Gabriel calling for tougher restrictions. It has also prompted Berlin to consider whether Kuka's technology is crucial for the digitalisation of German industry, an economic priority.

Kaeser, speaking to the broadcaster on the sidelines of Chancellor Angela Merkel's trade visit to Beijing, said he believed Gabriel, who is also Vice Chancellor, was relaxed about Kuka's situation.

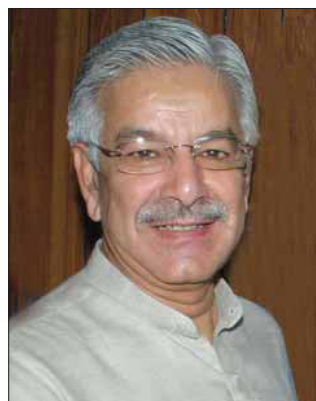
"I don't believe that Mr Gabriel has a concern," Kaeser said.

Pak Eyes \$58bn Investment in Power Sector Till 2022

Pakistan government has claimed that it has

lined up USD 58 billion investment in its troubled power sector till 2022 and hoped that the power crisis in the country would end by 2018.

This was stated by the Minister for Water and Power Khwaja Asif at a recent briefing organized by Prime Minister Office on the completion of three years of the Pakistan Muslim League-Nawaz government.



Khwaja Asif

Asif said USD 58 billion worth of investment in the power sector was expected for generation of 30,948 MW by 2022 and the power crisis would completely wipe out in 2018.

Power Secretary Younas Dagha said under the 10,400 MW portfolio of the China-Pakistan Economic Corridor 8,630 MW were currently under execution phases.

Asif said wastage of energy was a serious issue in Pakistan and the government was "getting absolutely no support from the provinces including from Punjab for energy conservation and closure of markets at sunset".

He said that Pakistan was blessed with a lot of sunshine, but the nation was doing business in electric lights. "This is sad," he said.

DPDC Realizes Tk 88 Lakh in Penalty

ferage during a three-week special taskforce drive in different parts of the capital recently.

The taskforce realized Tk 88 lakh in penalty, severed 17 power connections, seized nine tampered electricity meters, and filed cases against the offenders, said an official press release.

The taskforce led by DPDC secretary Mohammad Munir Chowdhury conducted drives at 22 industrial, commercial and residential establishments in the capital's Adabor, Matuail, Lalbagh, Khilgaon, Kamrangirchar, Mugdapara, Bashabo and Shyampur area.

Dhaka Power Distribution Company Limited (DPDC) unearthed 11 lakh units of power pil-

Bangladesh Wants Russian Co-Op in Energy, Construction, Tech

the areas of energy, construction and high technologies, President of the Federation of Bangladesh Chambers of Commerce and Industries (FBCCI) Abdul Matlub Ahmed said on the sidelines of the St. Petersburg International Economic Forum (SPIEF-2016) recently.

"As for the trade and economic cooperation this is energy in the first place. We already have an agreement on construction of a power plant. We're also seeking for ways to cooperate in the field of infrastructure, mainly the construction of high-speed highways. We also need high technologies in the field of machinery and textile industry," he said.

Bangladesh plans to enhance the trade and economic cooperation with Russia in

New CFO for Karnaphuli Fertilizer



Habibullah Monju

Karnaphuli Fertilizer Company has recently appointed Habibullah Monju as the chief financial officer of the company.

Monju completed his chartered accountancy articleship from KPMG, the company said in a recent statement.

He has also worked with Chevron Bangladesh, Pan Pacific Sonargaon, Pan Pacific Hotels and Resorts Pte, Singapore, ICB Financial Group Holdings, Malaysia, Holcim Bangladesh Ltd and DBL Group of Companies.

He completed his masters in accounting from Dhaka University and he is a fellow member of the Institute of Chartered Accountants of Bangladesh.

9,361 MW Capacity Power Plants Under Construction: Nasrul



Nasrul Hamid

9,361 megawatt (MW) are under construction at this moment in the country and the plants would go into operation in phases during 2016-2019, State Minister for Power, Energy and Mineral Resources Nasrul Hamid said.

The state minister said this in the Jatiya Sangsad (JS) recently while replying to a question from treasury bench member Tanveer Imam of Sirajganj-4 constituency.

Of the 31 under construction power plants, Nasrul said, 16 with 5,625-MW capacity are in the public sector and 15 with 3,736-MW capacity in the private sector.

The state minister informed the House that the power generation capacity of the country has been tripled to 14,539-MW during the present government.

Power Failure During Power Minister's Meet

Even after trying for three times, Power Secretary Monowar

Islam failed to reach the control room of the Dhaka Power Distribution Company (DPDC) recently when power failure occurred at Bidyut Bhavan during a meeting.

State Minister for Power, Energy and Mineral Resources Nasrul Hamid sat with the environmentalists and academicians in Bidyut Bhavan to discuss the Rampal power plant.

The power secretary also took part in the meeting alongside the state minister.

During the meeting, at around 2:30 pm, a power failure occurred. The conference room remained without electricity for some time and Monowar Islam immediately tried to contact the control room from his personal mobile phone.

He however failed to reach anyone there. Apparently frustrated, the secretary told the state minister, who sat right beside him, "I have tried three times so far, but nobody picks up."

Nasrul eased the air by adding a little humor, "Wherever I go, a power failures occur just to let everyone know that I am present there." This caused others to break into laughter. The electricity returned after a few minutes.

Barapukuria Coal Price Sees Drastic Cut as Sale Drops

The authorities of Barapukuria

Coal Mining Company Ltd (BCMCL) in Parbatipur upazila under the district cut their coal price by Tk 5,680 per tonne in three phases in last six months as their coal sale dropped alarmingly against the imported coal, said mine officials.

Coal price was raised to Tk 13,680 from Tk 9,200 end of 2014.

"We have cut the price considering the buyers although coal production cost of Barapukuria is high. The last decision to cut coal price became effective on May 19. Now anyone can buy our coal at Tk 8,000 per tonne," said Aminuzzaman, managing director (MD) of BCMCL.

Sale of coal has slightly gone up following the price reduction, he added.

Chevron Marks World Environment Day

Chevron Bangladesh marked World Environment Day by launching its 2016 tree plantation drive

at Rajuk Gulshan Central Park at a simple ceremony recently.

Chevron Bangladesh President, Kevin Lyon, inaugurated the program at an event attended by selected senior management and staff from its Dhaka headquarters, said a press release.

The Bangladesh chapter of Chevron's XYZ group – an employee network to connect, develop and inspire Chevron's workforce through innovative opportunities that are aligned with its business objectives to ensure the corporation's future success – led the event.

Chevron's Operations Director, Gordon Murray, and External Affairs Director, Naser Ahmed were present.

Chevron President, Kevin Lyon said, "Environmental stewardship has always been one of Chevron's core values, and World Environment Day presents an excellent opportunity to demonstrate that. Whenever possible, we've always encouraged our employees to take part in our corporate responsibility initiatives. And they've always enthusiastically stepped forward to help - whether it's through planting trees in and around our gas plants, donating blood at our annual donation drives, or by building homes for the underprivileged with Habitat for Humanity".



Thai Keen on Investing in LNG Sector

The private companies of Thailand have shown interest

to invest in power sector of Bangladesh including coal and Liquefied Natural Gas (LNG) based power plant here.

In this regard, Thai envoy Panpimon Suwannapongse recently met State Minister for Power and Energy Nasrul Hamid at his office and expressed her interest.

Hamid assured her that Bangladesh has a suitable market for profitable investment. "There is huge scope for earning profit and the government will provide the companies tax holiday," Hamid said.

The Thai envoy also expressed her interest for investing in deep sea port project, LNG, tourism, hospitality and hotel management and renewable energy. The Counselor of Thai embassy Oranus Watthayanon was present on the occasion.



Attack on Bogra Power Office

A group of youths vandalized Bogra electric supply office at Satmatha intersection in a recent morning, protesting

power outage in Nataipara area of the town the night before.

Two staff of the office--Lucky Akhtar, 42, and Mamunur Rashid, 32-- sustained minor injuries during the attack and received primary treatment at a local clinic.

Police picked up four of the attackers from the spot. They are Liton, 24, Saidul, 30, Abdul Aziz, 34, and Sagar, 27, of Nataipara area.

Locals said a transformer installed in Nataipara area blasted with a big bang.

Local people repeatedly tried to contact emergency section of the power office over phones, but no one received the phone calls.

Being aggrieved at the callous attitude of the staff, a group of 12/15 local youths, riding 5/6 motorcycles attacked the office. They beat up the two staff and ransacked furniture and telephone sets at the emergency section.

Sensing the trouble, the other employees closed the gate of the main office building and informed the police.

The Fuel of Choice

Saleque Sufi

The finite reserve of discovered natural gas in Bangladesh is fast depleting. Chronic crisis of gas supply is impacting upon power generation, fertilizer production, and operation of industries. There is perhaps no respite in the foreseeable future. The present initiatives of exploration and development of new gas resources and import of LNG may not bring any significant impact in less than 3-5 years. At the present rate of use, the remaining recoverable reserve may completely deplete in about a decade. Major depletion has already started. Crisis may start deepening as early as 2019. Imported LNG will be expensive even though present spot price is at its lowest.



The policy for rationalizing gas use to value added purposes only must be launched with immediate effect. Bangladesh can no longer afford using valuable gas resources for less valued sectors like domestic, commercial, CNG and captive power generation. Even fuel other than natural gas like coal and liquid fuel should be used for power generation as much as practicable. LPG must be preferred fuel of choice and LPG business must



be regulated for pricing, safety and use of standardized bottles and appliances.

Present Production & Use of Natural Gas

The present capacity of natural gas is 2,740 MMCFD from 101 wells of 20 producing gas fields. It is officially recognized that there exists over 500 MMCFD deficit in national gas grid and is widening. Petrobangla is implementing 500 MMCFD equivalent LNG import through setting up FSRU at Matarbari to relieve the greater Chittagong region from serious gas crisis which started from 2005 following rapid depletion of Sangu offshore gas field operated by Australian company Santos. There is no provision for augmenting additional gas diversion through national grid as Bakhrabad-Chittagong 24-inch OD ANSI#400 gas transmission pipeline has capacity

constraints. The following table would tell the story that some major gas fields have reached the production plateau. Most of the producing fields are showing signs of depletion. In these attempts to increase gas pro-

duction from these fields would only hasten their premature depletion. Demand side management is the only way to go now.

Three Petrobangla companies from 62 producing wells of 16 gas fields are producing 1052.90 MMCFD of gas, contributing 42.30% to national production on the day. Two IOCs from 39 wells of 4 gas fields producing 1433.50 MMCFD, accounting for 57.70% of national production. Semutang, Sundalpur and Begumganj discovered and developed by BAPEX have almost depleted. Bibiyana, Titas and Jalalabad contributed 70.70% of the total national production.

The table shows that 4 out of 7 urea fertilizer plants and several power plants are forced to shut down for gas supply constraints.

Gas Value Chain

Three Petrobangla-owned production

Summarised Gas Production Report (23-24 May 2016)

BGFCL	Titas	21	518	500.10	18.30%
BGFCL	Habiganj	7	225	224.10	8.20%
BGFCL	Bakhrabad	6	43	35.80	1.30%
BGFCL	Narshingdi	2	30	28.10	1.00%
BGFCL	Meghna	1	11	11.40	0.40%
SGFL	Sylhet	2	08	08.10	0.30%
SGFL	Kailashtilla	5	73	71.00	2.60%
SGFL	Rashidpur	5	60	57.80	2.10%
SGFL	Beanibazar	1	09	09.30	0.30%
BAPEX	Salda	1	10	09.10	0.30%
BAPEX	Fenchuganj	3	35	32.50	1.20%
BAPEX	Shahbazzpur	2	60	18.60	0.70%
BAPEX	Semutang	2	03	02.90	0.10%
BAPEX	Sundalpur	1	03	03.10	0.10%
BAPEX	Srikail	2	40	40.00	1.50%
BAPEX	Begumganj	1	2	0.20	0.00%
Subtotal	16	62	1120.00	1052.90	42.30%
Chevron	Jalalabad	6	260.00	275.10	11.00%
Chevron	Maulavibazar	5	50.00	35.90	01.30%
Chevron	Bibiyana	24	1200.00	1023.70	41.40%
Tullow	Bangura	4	110.00	98.90%	4.00%
Subtotal	4	39	1620.00	1433.50	57.70%
Grand Total	20	101	2740.00	2485.60	100%

Source: Petrobangla Website

Gas Distribution & Marketing: (Summarised Gas Production Report (23-24 May 2016))

Companies	Power Demand/ Supply (MMCFD)	Fertilizer Demand /Supply (MMCFD)	Other-Supply MMCFD	Total Demand /Supply	Remarks	Observation
TGTDCL	652/468	104.00/42	984	1746/1560.3 (including supply to non-grid power)	GPS Unit 1,4,6 Meghna ghat IPP 450 MW UFFL, PUFF shutdown	Constraints restrict power generation and fertilizer production.
BGDCL	371.00/256 .50	52.00/6.4	78.5	501/341	APS GT-1 Ashuganj 225MW AFCL shutdown	Constraints restrict power generation and fertilizer production.
KGDCL	150/54.20	115/50.4	116	380/230 (including non grid power)	SPS 40MW, Raujan unit1 CUFL shut down	Constraints restrict power generation and fertilizer production.
JGTDSL	219/117	45/38	74	338/229	Fenchuganj CC2 105 MW Bibiyana -2 341 MW shutdown	Constraints restrict power generation
PGCL	111/70		20	131/90	Westmont shutdown	Constraints restrict power generation
SGCL	45/18.6			45/18.6		
Total	1513/985	316/139		3101/2396	705 MMCFD deficit	

The table shows that 4 out of 7 urea fertilizer plants and several power plants are forced to shut down for gas supply constraints.

companies (BGFCL, SGFL and BAPEX) and two IOCs (Chevron and Tullow) are operating the gas fields. Petrobangla owned Gas Transmission Company Ltd (GTCL) as natural monopoly evacuates the gas from the producing companies and delivers to custody transfer metering stations of 6 regional distribution companies (TGTDCL, BGDCL, KGDCL, JGTDSL, PGCL, and SGDCL).

GTCL in recent years has expanded the capacity of national transmission grid through setting up pipeline compressor stations, constructing loop lines and expanding the transmission network from Tecknaf to Tetulia almost. Very soon with the construction of Padma Multipurpose Bridge, gas network will also expand to greater Faridpur and Barisal regions. This

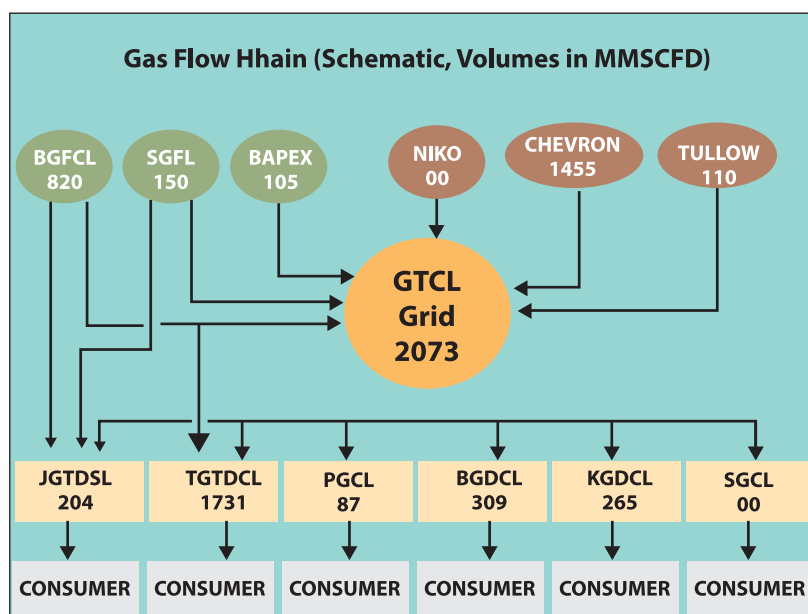
nationwide gas transmission network has already created infrastructure for moving gas across the entire Bangladesh. When the gas supply capacity will be expanded with new addition to gas reserve and import of LNG and pipeline gas, it can boost nationwide industrialization.

Rational Use of Gas

Some 36% of present gas is being

used in domestic, commercial, captive power generation and CNG. On the other hand 64% goes to power, fertilizer and industries only.

A survey indicated that only 12-15% of the population gets benefit of pipeline supply of gas while over 80% have to rely either on expensive LPG or electricity, kerosene and bio mass. The pipeline gas supply is restricted mostly to urban population who can afford to pay higher for the fuel. Moreover, being mostly unmetered there is huge misuse of gas. There is rampant theft and pilferage in gas distribution system. The gas franchise has become so extensive that it has become a huge challenge to monitor and control all users. Moreover, gas distribution networks in many areas



of Dhaka, Sylhet and Chittagong region have become aged. Gas is leaking and gas is a silent killer as has already been evidenced in several instances.

Gas price rationalization can be a useful way to go through increasing gas price of domestic consumers bringing it closer to LPG pricing. But even that may not bring effective result, as monitoring huge brigade of domestic users will also be difficult. Pre-paid metering system for all users will also not be economic.

In such situation gradual phasing out of gas supply to end users, which can be switched over to alternate fuel LPG, is the right approach. The decision to diversify fuel mix for power generation will relieve gas from stress. Let our precious gas resource and expensive LNG be used for value added industries and fertilizer only. Domestic, commercial and CNG users can be replaced with LPG in a planned manner. It is unethical that 85% of the population will continue paying higher prices for domestic fuel while fortunate few will continue to be blessed with cheaper supply of pipeline gas supply.

Even industries using gas must come under technical auditing. Gas supply to fuel inefficient industries must replace their boilers and other gas using equipment will fuel efficient devices. Gas supply to captive power generation must also come under review. Only those who can introduce cogeneration and tri generation using modern appliances can continue as gas users. Metering system

of all industries using gas must also be modernized and come under telemetering system.

Fuel inefficient power plants are being replaced gradually in the re-powering program. Some fertilizer plants like PUFF, UFFG, AFCL and CUFL must also be modernized for fuel efficiency or retired.

Policy and Regulation for LPG Business

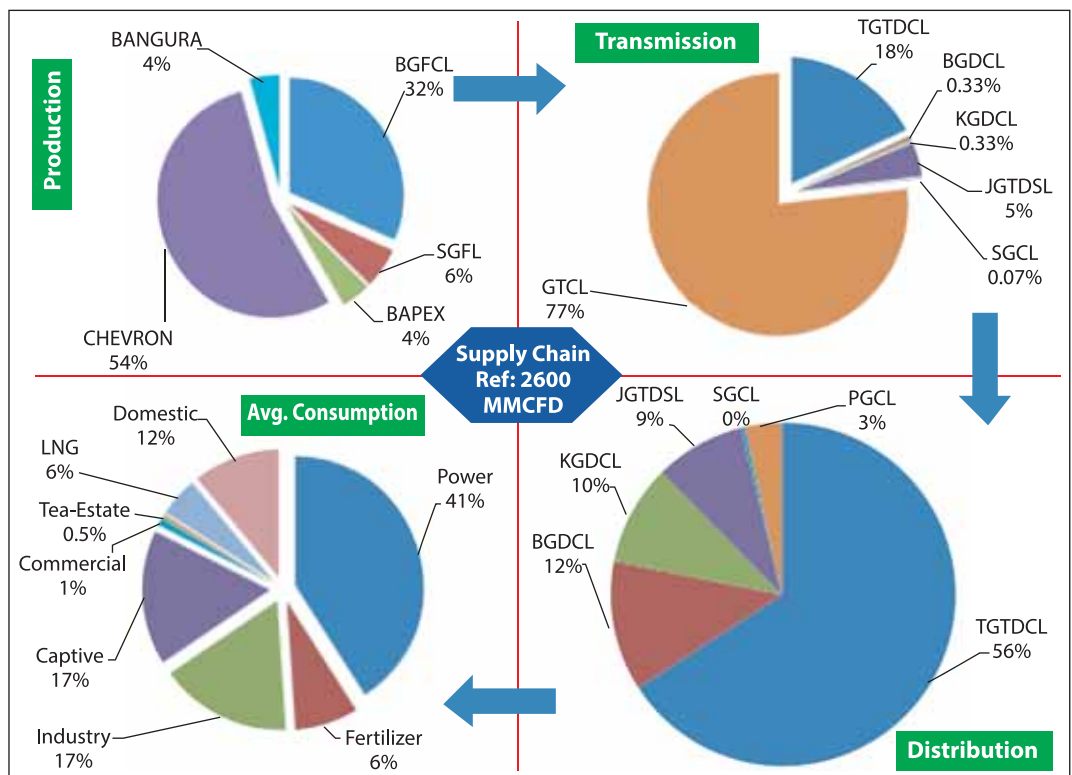
It is encouraging that the government has adopted a policy for bringing 70% of the population under LPG coverage for domestic use of gas within the next 3-5 years. The government has also adopted LPG policy covering import, storage, bottling and distribution of LPG. The policy may be let out in ministry website soliciting opinion of stakeholders.

We hope reliable demand survey and feasibility study are being carried out. The accurate assessment of demand is a must for such program for its success. There must be a right mix of public and private sector LPG bottling and suppliers so that it does

not experience the sad episode of CNG. At present ERL and SGFL (Koil-lashtilla) produces LPG raw materials locally. Some private sector also imports and bottles LPG. There are various allegations of irregularities in LPG business regarding price control. Users are often alleging to have been held hostages. In this context, EMRD finalizing LPG policy and implementing it would be very appropriate. But instead of entrusting various agencies like Department Of Environment, Explosives Directorate, BEREC, and EMRD for permissions and licenses can there be one-stop services? BEREC can be developed as an authorized body for enforcing LPG policy and ensuring compliance. LPG business must not open Pandora box for everyone. It is a specialized work and only companies having credible track records must be allowed to enter and establish the business.

EP

Saleque Sufi;
Contributing Editor



A Review on Energy Budget

Khandkar Abdus Saleque

The government in its past term since 2009 had inherited a power and energy sector with a chronic crisis of huge deficit. The power load shedding and energy shortages almost brought the economic activities to a standstill situation. The government had been left with little other choice than to take up crisis management contingency action plan. By 2016, the situation has been brought under reasonable control through successful implementation of short term contingency action plans. The Medium term and long term initiatives are at different stages of implementations. In May 2016, the installed capacity had reached 14,539 MW. Per capita power use is now 371 kW. About 76% of population has now access to power of some form. Renewable energy is contributing about 430MW. Another 600 MW is coming through import from India.

The present generation capacity is more than the demand. Yet capacity utilization cannot be made for primary fuel supply inadequacy and constraints in power transmission and distribution system. Gas supply deficit reportedly makes about 1000MW available generation capacity remaining idle. The highest generation that could be achieved so far is 8348MW on 09/04/2016. Gas production capacity is 2740 MMMCFD from 20 producing wells. The deficit is over 500MMCFD. Petrobangla can

supply maximum 1000 MW for power generation. Even that situation requires Petrobangla diverting gas from other users like fertilizer, CNG and others. Proven recoverable reserve of gas is depleting. The Government has launched initiative for importing LNG and expediting exploration and development for new gas resources. The government has also adopted plans for diversifying fuel mix for power generation and expanding use of LPG in domestic, commercial and replacing CNG with LPG for vehicular use.

Again for power transmission and distribution system constraint only 70% of the power can be supplied to end users. System needs to be updated and modernised. The menace of theft and pilferage from power and energy system has to be eliminated. The government agencies could expand transmission grid to 9789 circuit kilometre and distribution network to 3,72,000 kilometre by March 2016. To achieve greater control over power use 100,000 prepaid meters could be set up by this time. System loss which was 15.6% in 2008 has been brought down to 10.4% by end March 2016.

We have seen serious reluctance among the investors for making major investments over the past few years as power and gas supply inadequacy, lack of infrastructure, protracted decision making process made the cost of doing business in Bangladesh less attractive

than other developing countries.

Another major challenging area is human resources development. The government has initiated many milestone projects in energy, power and infrastructure development. But apart from very few, most of the projects are running behind schedule requiring allocated fund of development budget reaming unutilized. One of the major reasons for this is lack of technical and managerial expertise of development project implementing agencies.

Let us have a view how the Power, energy, infrastructure and human resources development sectors allocation for 2016-2017 compares with budgetary allocations of previous years.

Discussion about Power & Energy Sector

The Finance Minister has announced a target for adding another 16,086 MW installed power generation capacity by 2021. He mentioned that 29 power plants of total capacity 7296MW are under construction, tender process of another 20 power plants with a capacity of 6681 MW are at advanced stage and 8 more plants with a capacity of 4435MW are at planning stage. Another power plant in private sector at Maheshkhali is under negotiation.

The Finance minister has given very optimistic view about power generation. But he should have mentioned the status of all major power generation projects under implementation. He could have also mention why it is not possible to generate 80-90% of the presently installed capacity and why in 2016 a major section of citizen had to bear the ignominy of power load shedding?

Sectoral Allocations

Tk in Crores

Sectors	Budget 2016-27	Revised Budget 2015-2016	Budget 2015-16	Budget 2014-15	Budget 2013-14	Budget 2012-13	Budget 2011-12
Human Resource (Education, Health & Others)	27,203	19,555	21,308	16,191	14,170	11,420	8,577
Agriculture & Rural Development	27,094	24,201	24,521	19,530	16,567	15,622	12,313
Power & Energy	14,951	16,544	18,479	5,844	10,229	10,135	7,927
Communication Infrastructure	97,802	79,384	85,967	54,856	51,699	45,092	33,995

ECA will provide 3000 Crore taka for power sector and state owned enterprises from their own fund will also provide Tk 12, 646 Core making the ADP allocation for Power and Energy Sector to Tk 1, 23,346 core

Alternate Fuel for Power Generation

Finance Minister talked about fuel diversification for power generation considering coal, diesel and furnace oil, nuclear power and renewable sources side by side to natural gas. He mentioned that coal has been chosen as preferred fuel option for power. He also mentioned that by 2021 about 3100 MW power will be generated from renewable energy.

Fuel diversification is a must in view of the rapid depletion of discovered gas resource. But unlike other years, he kept silent about own coal resource development plan. We believe that leaving our coal below surface and relying on imported fuel exclusively will make our energy security vulnerable. Coal and LNG may be relatively cheaper now. But there is no guarantee how long it will remain within affordable limit of Bangladesh. Moreover, any interruption of imported fuel value chain for global or regional geopolitics will cause significant impacts.

Power Import

The Finance Minister mentioned that under regional cooperation by 2030, around 6500 MW power will be imported from regional countries. Around 600 MW power is currently imported from India and another 500 MW import is under process.

The issues and options of regional and subregional power trading are being discussed for almost one and a half decade with very nominal success. India is the major power producer and user in the region. It has long term contracts for importing power with Nepal and Bhutan. Bhutan is the only country of the region which has surplus at this moment. But it has commitment to export to India. Nepal has huge generation potential. But it itself suffers from chronic power deficit though under contract it exports power to India. Any power import from Nepal and Bhutan requires developing additional power generation capacities and power transiting through Indian territories to Bangladesh. India is not power surplus country. Some of its region may have surplus but other regions have major

deficit. The issues and challenges of SAARC region power and energy grid are in discussion for a long time. USAID, World Bank, ADB and SAARC Secretariat worked and are working. Technically the issues are manageable, commercially it is viable. We believe governments of the region have political will and commitment. But geopolitics and fragile bilateral relations among nations are major hindrances.

Private Sector Investment in Power Sector

The Finance Minister informed that government is working on increasing private sector investment in the power sector either on standalone basis (IPP) or under joint venture. Under repowering program fuel inefficient power plants are being replaced with efficient plants. Side by side with IPP and innovative process of developing power plants under Export Credit Agency (ECA) financing is also under review.

But the private sector can set up plants if the government can ensure sustainable fuel supply. In case of imported coal and LNG based power generation government has to set up import infrastructures. It is impossible for any local private sector to go for imported fuel based power plants without assured supply of fuel.

Gas Reserve Expansion & Production Enhancement

The Finance Minister has declared an ambitious project of BAPEX drilling 108 wells including 53 exploration wells by 2021. He mentioned that about 943-1105MMCFD gas will be produced from these wells.

It is a very ambitious plan. The history of gas exploration in our region from 1908 to 2016 has seen only 83 exploration wells drilled by different IOCs and Petrobangla/BAPEX. BAPEX has drilled 35 wells, including 3 exploration wells under its own program from 2009-2015. In this scenario burdening an emerging company like BAPEX with gigantic tasks of drilling 108 wells seems way beyond reach. People can only make only wild guess about finding petroleum based on seis-

mic surveys. Till gas structure is discovered in exploration and tested and further assessed through development wells it sounds ridiculous talking about a figure of gas availability. BAPEX is an emerging company. It can proceed on a realistic plan and work with major E&P under strategic partnership for maturing into an E&P company of choice.

The Finance Minister should have mentioned about plans for offshore exploration, deep water PSC and letting out exploration in the onshore frontier areas outside BAPEX allocated blocks and ring fenced area for PSC bidding.

LNG Terminal & LNG Import

The Finance Minister stated about 138,000 cubic meter capacity FSRU installation at Maheskhilai and LNG import. He also mentioned about 2 more land based LNG terminal construction at Maheskhilai and Payera. He mentioned that government has committed to resume gas connections to Industrial consumers in 2018.

FSRU at Maheskhilai and LNG import is under discussion since 2010. Around 500 MMCFD-equivalent LNG may start flowing in the national gas grid by 2018. Detail techno economic feasibility study is essential for Land based LNG terminals to assess the costs and other technical challenges of LNG terminals in our coastal areas.

The present deficit of gas as per official statement in a 2740MMCFD gas production is over 500 MMCFD. But taking all unmet demands into consideration the deficit now may be 1000 MMCFD and growing. By 2018 there is every possibility that production capacity will further deplete and demand will grow. Chittagong region itself has about 300 MMCFD gas deficit even as of now. Unless demand side is managed through drastically reducing gas supply to captive generation, domestic and CNG gas supply situation in 2018 may not significantly be improved even with 500 MMCFD-equivalent LNG import.

Conclusion

Power and Energy sector budget allocation in the proposed budget for

2016-17 is less than the revised allocation of 2015-2016. There are justifications for that. In the energy sector most of the GTCL gas transmission infrastructure development projects are at the last stage of completion. It needs only the residual allocations from the approved or revised projects costs. Most of the power projects which are at advanced stage are being implemented under Joint Venture and G-G bilateral arrangements. Moreover, ECA financing is being endeavored. Low price of crude oil and petroleum products have relieved BPC and BPDB of the operating losses that they incurred during high crude price. The government is not required to pay subsidy to these state owned enterprises.

The government now has to allocate major fund to BAPEX for its mega project and make it easy for them to access. The government also needs to consider that imported LNG even at its present relatively lower price would require subsidy to reduce impacts on local use. The government may need to provide subsidy to LPG users to implement plans for expanding LPG use.

Imported higher grade coal, construction of expensive infrastructures for imported fuel and use of Ultra super critical technology in power generation will make cost of power generation higher. The government must seriously rethink its strategy for exploring and exploiting own coal resource. We are not sure how without exploiting the local coal resource and setting up local coal based mine mouth power plants, the government can achieve sustainable energy security relying mostly on imported fuel and imported power.

In summary budgetary allocations for power and energy sector as proposed appear practical. But technical and managerial capacity of energy & power projects implementation agencies and monitoring units of the government need to be significantly enhanced for avoiding delays and ensuring quality.

EP

Khandkar Abdus Saleque;
NRB Energy Professional

Report

Riyadh Agrees to Invest Petro-Fund in Mega Projects in Bangladesh

The relationship between Dhaka and Riyadh has reached a new height where for the first time Saudi Arabia has expressed its willingness to channel its public fund for investment in Bangladesh.

During the recent visit of Prime Minister Sheikh Hasina to the kingdom, the issue was discussed with the top Saudi leadership.

"Bangladesh wants Saudi public investment in different development projects in infrastructure, communications and

energy, and Saudi Arabia responded positively," said a Bangladesh Mission official in Riyadh.

The prime minister in her meeting with Saudi King Salman bin Abdulaziz during visit put forward proposals to invest in several mega development projects and the king instructed relevant ministers to visit Dhaka to discuss in details about the projects.

Nazrul said Saudi Arabia has adopted a plan to transfer its billions of dollars of petro-fund from Europe and America to Asian countries like Bangladesh.

The kingdom country also wants to reduce its economic dependency on oil revenue and invest in real and other sectors to absorb any negative oil shock, he added.

EP



ABB Unveils Next Generation Low Voltage AC Drives

Discrete Automation and Motion division of ABB Bangladesh Limited successfully organized a Product Launching event for new ranges of Variable Frequency Drive on 02 June 2016 in Dhaka, Bangladesh.

The event was attended by over 150 customers coming from various industrial sectors which included textile, pulp & paper, water & wastewater, food & beverage, chemical and cement.

The interactive session highlighted on show casing the features and benefits of the newly launched "All Compatible Industrial Drives - ACS880", "An Optimal Solution for Pump Applications - ACQ810" and "Effortless Energy Efficient General Purpose Drive -

ACS580".

Karthikeyan Anbanandam and Harish Somanahalli Ramaiah of ABB India Limited were the main speakers for the event.

The powered up demo-kits and products displayed and demonstrated by the service team in the program earned appreciation from the Customers as they could visualize and get a feel of the new generation of products.

Spinning Mill and Water and Wastewater Customers specifically acknowledged the worthiness of ABB's spinning macro in ACS880 and tailor-made pump control functions for single and multi-pump systems in ACQ810.

EP

Siemens, Gamesa to Merge Wind Businesses

EP Report

Siemens and Gamesa have signed binding agreements to merge Siemens' wind power business, including wind services, with Gamesa to create a leading global wind power player.

Siemens will receive newly issued shares of the combined company and will hold 59 percent of the share capital while Gamesa's existing shareholders will hold 41 percent, according to a joint press release issued in Munich on June 17.

As part of the merger, Siemens will fund a cash payment of €3.75 per share, which will be distributed to Gamesa's shareholders (excluding Siemens) immediately following the completion of the merger (net of any ordinary dividends paid until completion of the merger).

The cash payment represents 26 percent of Gamesa's unaffected share price at market close on January 28, 2016.

Additionally, Gamesa and Areva have entered into contractual agreements

whereby Areva waives existing contractual restrictions in Gamesa's and Areva's offshore wind joint venture Adwen, simplifying the merger between Gamesa and Siemens. As part of these agreements, Gamesa – in alignment with Siemens – grants Areva a put option for Areva's 50 percent stake and a call option for Gamesa's 50 percent stake in Adwen.

Both options expire in three months. Alternatively, Areva can in this time divest 100 percent of Adwen to a third party via a drag-along right for Gamesa's stake.

The new company, which will be consolidated in Siemens' financial statements, is expected to have on a pro forma basis (last twelve months as of March 2016) a 69 GW installed base worldwide, an order backlog of around €20 billion, revenue of €9.3 billion and an adjusted EBIT of €839 million.

The combined company will have its legal domicile and global headquarters in Spain and will remain listed in Spain.

The onshore headquarters will be located in Spain, while the offshore headquarters will reside in Hamburg, Germany, and Vejle, Denmark.

The two businesses are highly complementary in terms of global footprint, existing product portfolios and technologies. The combined business will have a global reach across all important regions, and manufacturing footprints in all continents.

Siemens' wind power business has a strong foothold in North America and Northern Europe, and Gamesa is well positioned in fast-growing emerging markets, such as India and Latin America, and in Southern Europe.

Further, the transaction will result in a product offering covering all wind classes and addressing all key market segments to better serve customer's needs.

"The merger with Siemens constitutes recognition for the work performed by the company in recent years and evidences our commitment to generating value in the long term by creating significant synergies and extending the horizon of our profitable growth. Today, we are embarking on a new era, creating, alongside Siemens, a world-leading wind player. We will continue to work as before, albeit as part of a stronger company and with an enhanced ability to offer all of our customers' end-to-end solutions," said Ignacio Martín, Executive Chairman and CEO of Gamesa.

"The combination of our wind business with



Gamesa follows a clear and compelling industrial logic in an attractive growth industry, in which scale is a key to making renewable energy more cost-effective. With this business combination, we can provide even greater opportunities to the customers and value to the shareholders of the new company. The combined business will fit right into our Siemens Vision 2020 and underlines our commitment to affordable, reliable and sustainable energy supply," said Joe Kaeser, President and CEO of Siemens AG.

Siemens and Gamesa expect significant synergy potentials in a combined setup. In total, annual EBIT synergies of €230 million are expected in year four post closing.

"As a leading wind power player, especially in emerging markets, Gamesa is a perfect partner for us. Teaming up will enable Siemens and Gamesa to offer a much broader range of products, services and solutions to meet customer requirements. The move will put Siemens and Gamesa in the best position to shape the industry for lower cost of renewable energy to the consumers," said Lisa Davis, member of the Managing Board of Siemens AG.

The envisaged combination is unanimously supported by Gamesa's Board of Directors and Siemens' Supervisory Board. Iberdrola has entered into a shareholders agreement with Siemens and will hold around 8 percent in the combined company after closing of the transaction.

The transaction is subject to approval by Gamesa's shareholders and to other customary conditions such as merger control clearances and the confirmation by the Spanish stock market regulator (CNMV) that no mandatory takeover bid has to be launched by Siemens following completion of the merger.

Supervision of the merger process has been entrusted by Gamesa to a Merger Committee created ad hoc, which will be made up exclusively of independent directors. Closing is expected in the first quarter of calendar year 2017.

EP

Report

1320MW Coal Power Plant of SS Power Gets Environment Clearance

The Department of Environment (DoE) has awarded the location environment clearance for construction of the coal-based 1320 megawatt (mw) power plant at Gandamara union of Banskhalia upazila of the district.

The environmental impact clearance on the site of the power plant was issued by the DoE, Chittagong on different conditions on June 13 last, following which the S Alam Group, local entrepreneur of the power plant, would have no bar on starting construction work, sources concerned said.

The conditions include rehabilitation of the affected villagers, protection of the tradition and culture of the locality, suspension of construction works by night time on the site, works by night time with permission by the DoE, protection of the natural canals of the area, construction of environment-friendly build-

ings etc.

S Alam Group applied for the plant's environment clearance in August 2015. The DoE stated that it has examined pros and cons of the project's environmental impact on the locality and its people before issuing the clearance.

Four persons including two brothers were killed and 19 others injured including 11 members of the police on April 4 last as the police and two groups of villagers of Gandamara for and against the proposed coal-based power plant clashed at Hadipara Primary School field.

SS Power Ltd and two firms of Chittagong will jointly implement the project worth US Dollar 2.50 billion with 70 per cent owned by the SS Power Ltd of S Alam Group and 30 per cent by the Chinese firms.

EP

Rajshahi Suffers 16-hr Blackout Due to Grid Failure

Owners and employees of different shops who usually pass hectic days before the Eid were seen sitting idle on the stairs outside. Some were sitting inside with palm-leaf fans in their hands with no customers in their shops.

This was the scene at Shaheb Bazar Zero point, Rajshahi city's main business area, recently when the city was enduring a 16-hour blackout.

It became worse as water supply got snapped following the blackout.

"It was a complicated system protection failure on the national grid following a fault in the power distribution line during the day's incessant rain," said a PDB official.

Power supply to the entire city went out. Local experts managed to recover power two hours later, he added.

But the power failure occurred again when the system protection of the national grid at a sub-station failed. They called for experts of Power Grid Company of Bangladesh (PGCB) from Ishwardi who restored power supply to some 95 percent area of the city 14 hours later, he said.

EP



Technicians tried to repair at Katakhal grid sub-station people of Rajshahi region get electricity from this sub-station

Nuclear Power Plant May See Cost Hike in Some Components

The first phase of Rooppur Nuclear Power Plant project is likely to see changes in some of its components, including cost hike in research, services and construction sectors, in its proposed revision.

Officials at the Ministry of Science and Technology said the ministry has proposed the first revision of the project to the Planning Commission for raising the cost in some components, including research and construction purpose.

However, the ministry is not in favor of raising the overall project cost and the sched-

uled timeframe, they said.

The officials said the project is expected to see cost cut in some of its components, including maintenance and preservation, resource collection, manpower salaries and physical contingency.

The first phase of the project is being implemented at a cost of Tk 50.87 billion by the Ministry of Science and Technology from April 2013 to June 2017. Of the total project cost, Tk 10.87 billion will come from the national exchequer while Tk 4,000 crore as project assistance.

EP

Purchase Body Approves LNG Terminal Deal

The Cabinet Purchase Committee recently approved awarding contract for setting up the proposed LNG terminal at Moheshkhali in Chittagong area on build-own-operate and transfer (BOOT) basis.

The Purchase Committee approved a total of nine proposals. The meeting of the Cabinet body was chaired by Industries Minister Amir Hossain Amu.

It gave the approval to state-owned Petrobangla to sign a number of contracts with Excelerate Energy Bangladesh Limited (EEBL), as subsidiary of Singapore's Excelerate Energy, for setting up the terminal with next 18 months.

The deals are Terminal Use Agreement (TUA), Implementation Agreement (IA) and Side Letter Agreement (SLA).

With these three deals to be

signed, the officials said, Bangladesh will actually enter the final stage of implementation of its long desired LNG terminal project to mitigate its nagging gas crisis.

Currently, Bangladesh is producing about 2,700 mmcf/d gas against its demand for 3,200 mmcf/d keeping shortfall of 500 mmcf/d.

The liquefied natural gas (LNG) terminal will have a 138,000 cubic metres capacity floating storage and regasification unit (FSRU). The terminal will supply 500 mil-



Joint Body to Set Terms for JV With Gazprom

A joint working committee comprising officials from state-run Bapex and Russian Gazprom will fix up modalities for setting up a proposed joint venture (JV) firm for hydrocarbon exploration at home and abroad.

State Minister for the Ministry of Power, Energy and Mineral Resources (MPEMR) Nasrul Hamid directed formation of such a committee during a meeting with top officials of Gazprom, Petrobangla and Bapex in the Secretariat recently.

Hamid stressed the necessity to upgrade the working capacity of the Bangladesh Petroleum Exploration and Production Company Ltd (Bapex) to international level.

Bapex's capacity would be

upgraded to such a level that it could carry out exploration overseas as well as at home, he said.

Gazprom managing director Andrey Firk led the 10-member delegation during the meeting attended by Petrobangla chairman Istiaque Ahmad and other top officials.

Officials said, Petrobangla, Bapex and Gazprom officials already discussed several times the issue of establishment of the proposed JV but without any headway.

Gazprom has been eyeing a big role in Bangladesh's hydrocarbon sector and submitted a formal proposal to Petrobangla in February last year over formation of the JV.

EP



State Minister for the Ministry of Power, Energy and Mineral Resources (MPEMR) Nasrul Hamid presides over the meeting with high officials of Gazprom, Petrobangla & Bapex in the secretariat

lion cubic feet (mmcf) gas per day by regasification of imported LNG to the national

gas network.

Bangladesh will have to pay a total of \$90 million as terminal charges excluding tax, VAT and insurance fee to the LNG terminal operator to use its facilities.

In that case, Petrobangla will have to pay about \$159,186 per day as fixed component of fees, \$45,814 as operating component fees and \$32,000 to the terminal operator. EP

Muhith: Power Generation in Rooppur Plant to be Costly

Finance Minister AMA Muhith said the power generation cost in the proposed Rooppur Nuclear Power Plant will be higher than usual.

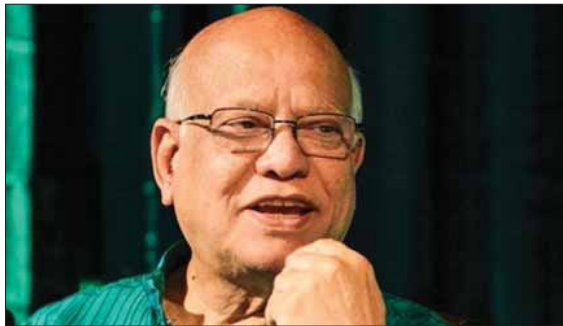
He said cost of 2,400MW power generation in nuclear power plant is usually \$3.5bn, but in the proposed plant the cost will be \$11bn. "This will be really expensive for countries like Bangladesh,

but we are looking into the matter and will assess the unit cost. There will be a committee to work on the matter," finance minister told journalists on his return from an investment conference in Russia recently.

He further said the issue of environment surrounding the Rooppur plant is also important and in Russia he has visited two under construction

nuclear power plants and observed the environmental issues there.

EP



LNG Industry to Grow in Next Four Years

Significant liquefaction and regasification capacity growth in North America and Asia will drive the global liquefied natural gas (LNG) industry over the next four years, according to research and consulting firm GlobalData.

The company's latest report states that North America leads the world in planned liquefaction capacity additions by 2020. Indeed, out of 75 planned liquefaction terminals expected to come on-line worldwide by 2020, 42 are planned to start operations in North America.

A total of 13 LNG regasification projects were added since GlobalData's LNG ca-

capacity report in November 2015. The terminals added include Iran Floating, Damerjog in Djibouti, and Gorskaya Floating in Russia.

Demand for natural gas in Asia is continuing to drive regasification capacity growth, with India and China expected to have the highest capital expenditure of all countries to bring planned regasification terminals on-line.

Indeed, it is expected that an estimated sum of US\$17.1 billion will be spent between 2016 and 2020 to increase regasification capacity by 7.4 trillion cubic feet in the two countries.

EP

New PSMP Eyeing Energy Efficiency

The Power System Master Plan (PSMP)-2016 which is being formulated pinning 2041 has laid emphasis on the efficient management of power.

Japan International Cooperation Agency (JICA) is assisting Bangladesh in formulating an extensive energy and power development plan up to the year 2041, covering energy balance, power balance and tariff strategies following the country's aspiration to become a high-income country.

"If it is possible to ensure efficient management (production, transmission and use) of power, we could be able to save up to 10,000MW," said Power, Energy and Mineral Resources Affairs Adviser to

the Prime Minister Dr. Tawfique-Elahi Chowdhury, BB while addressing as the chief guest at a steering committee/stakeholder consultation meeting on the PSMP-2016 recently.

He said for the efficient management of power, necessary technology would also be required and "we would move to accumulate such technology based on the research."

Emphasizing on the necessity of research, the adviser said the PSMP-2016 would be finalized after consultation with private sector and academics.

Power division organized the meeting at Biddiut Bhaban where JICA presented the PSMP-2016 before the stakeholders of the sector.

EP



Daewoo Wants to Explore One Bay Block

On February 4, Petrobangla invited EOIs to explore and develop three deep-sea blocks – DS 12, 16 and 21 – in the Bay of Bengal.

South Korean Daewoo International Corporation has expressed interest to explore for oil and gas at one of the deep sea blocks in the Bay of Bengal instead of three blocks.

"Daewoo and Petrobangla recently discussed the proposed terms and conditions for exploring the block DS-12," a Petrobangla official said.

The official said the South Korean firm was keen to explore under the current terms and gas pricing.

It would be beneficial for Bangladesh if Daewoo inks a production sharing contract (PSC) for exploring the block, the official said.

On May 7, Daewoo submitted Request For Proposal (RFP) documents to explore and develop oil and gas resources in Bangladesh's deep sea blocks.

EP

Rooppur Nuclear Plant Gets Site Licence to Start Work

Bangladesh Atomic Energy Regulatory Authority (BAERA) recently issued site license to Rooppur Nuclear Power Plant Project to start the main construction work.

The license issuing ceremony was organized by BAERA at a hotel in the capital. BAERA chairman handed over the license to Bangladesh Atomic Energy Commission (BAEC).

Naiyyum Chowdhury, chairman of BAERA, handed over the license to BAEC Chairman M Ali Zulqarnain.

Speaking on the occasion, Naiyyum Chowdhury said:

“Giving site licence is not the end of the journey, rather it’s the end of the beginning only.”

M Ali Zulqarnain said they will make sure that the works in the project will be conducted on time and in proper manner.

Speaking on the occasion as the chief guest, Yeafesh Osman, minister of the Ministry of Science and Technology, said that that implementation of the plant will make Bangladesh a proud member of the nuclear world.

EP



Reliance Offers to Sell LNG to Bangladesh

Indian energy giant Reliance Group has expressed the desire to not only set up a power plant in Bangladesh but also sell 100–150 mmcf of LNG every day to the government.

A draft agreement has already been sent to the Petrobangla in this regard.

Petrobangla officials said they have received a proposal from Reliance and would consider the issue as the government is interested in buying LNG.

“The government has formed a committee to consider the proposals of Reliance and other companies in this regard,” said an official.

However, some committee members, preferring anonymity, said the government should look at proposals from all the companies, including Reliance, and take a decision only after careful consideration.

Reliance in its proposal has stated that it wants to set up a floating storage and regasification unit (FSRU) at Maheshkhali in Cox’s Bazar, which would add 250 mmcf of gas per day to the national grid. Out of this, it would use 100mmcf for generating 1500 MW of power in a plant to be set up at Meghnaghat.

EP

Power Sector Faces Seven Challenges

The power sector would face seven challenges in the coming days, State Minister for Power Nasrul Hamid told the parliament recently.

The challenges are primary fuel, skilled manpower, service enhancement, reduction of corruption at field level, making renewable energy popular, implementation of projects in due time and ensuring investment.

The state minister talked about the issue while participating in a general discussion on the proposed budget for 2016-17 fiscal.

He said the government had planned to set up four floating regasification units, and is going to set up three land-based LNG terminals to en-

sure primary fuel in the country.

Aiming to create skilled manpower, Nasrul said the government wanted to introduce a curriculum on power and energy. “This course is also absent at the university level, but we need enough electrical mining engineers.”

On the improvement of service and reducing corruption, Nasrul said the transmission and distribution payment gateway should be privatized, while distribution companies should be service-oriented.

He also opted for automation of all the systems through call center supervisory control and data acquisition system.

EP

Green Activists Oppose Project

The meeting between environmentalists and academicians who are vehemently opposed to the coal-based Rampal power plant near the Sundarbans, and those implementing the project—government officials and officials of the power company—ended recently on a futile note.

Officials of the Ministry of Power, Energy and Mineral Resources met several renowned environmentalists and academicians at a meeting at Bidyut Bhaban. State minister for power, energy and mineral resources, Nasrul Hamid, initiated the meeting.

Lauding the government initiative to bring them to

the same table for discussions, the environmentalists and academicians said the meeting would ultimately change neither their stance nor that of the government.

The government said it was “lenient” enough to take the suggestions of the protesters against the Rampal power plant into consideration. It, however, was firm about implementing the project.

On November 19, 2015, the government had taken some of these environmentalists and academicians to the project site of Rampal power plant in a bid to convince them. That trip had ended without any result for both sides.

EP

No Tripura Gas Export to Bangladesh for Now

Delhi would not export gas to Bangladesh from Tripura state, Indian Petroleum and Natural Gas Secretary KD Tripathi has said.

"India has not enough gas to consider the export issue right now? India is running short of gas," quoting the Indian Secretary, Bangladesh's Energy Division Secretary Nazimuddin Chowdhury told some reporters at his secretariat office recently.

He was talking on the outcome of his recent two-day visit to India.

India is not ready 'now' to negotiate the premium rate to export diesel to Bangladesh through the 130-kilometre cross-border pipeline from

Numaligarh Refinery Limited (NRL) in Assam to Parbatipur fuel depot, under Dinajpur district, Nizamuddin added.

Nazimuddin visited India on June 13-14 to attend the first energy dialogue to discuss energy cooperation and cross-border energy trade issues, which has been growing between the two countries in line with the Dhaka-Delhi joint declaration during the Indian Prime Minister Narendra Modi's visit to Bangladesh in 2015.

However, India sought Bangladesh's approval to its proposal to install a LNG terminal and bottling factory at Kutubdia under Cox's Bazar district, the Energy Secretary said. **EP**

8 Power Sector Projects Put on 'Fast Track'

The government has put eight power sector projects on 'fast track' giving an allocation of Tk 11,416.74 crore in the 2016-17 fiscal year.

The government's budget document titled 'Kathamo Rupanbare Brihat Prokalpo: Probriddhi Sanchare Natun Matra' (Large Projects in Transformation of Structure: New Dimension in Spreading Growth) revealed the information on the fast track projects.



According to the document, the 1320 MW Rampal power project which was named as 'Moitree (Friendship) Super Thermal Power Project' received the highest allocation of Tk 2540 crore. The total project cost was estimated to be Tk 15,000 crore.

It is followed by 1200 MW Matarbari Ultra Super Critical Coal-fired Power Project which got an allocation of Tk 2,400 crore against its total project cost of Tk 35,984 crore.

Two projects in the power transmission sector were picked as fast track projects.

Of them, Na-

ECNEC Approves Tk 12.78b Power Line Expansion Project

The government recently approved a power distribution line expansion project in the western region of the country at a cost of Tk 12.78 billion in a bid to provide electricity to more people.

Presided over by Prime Minister Sheikh Hasina, the Executive Committee of the National Economic Council (ECNEC) at its meeting approved two fresh projects including power distribution one and revised three other projects.

After the meeting, Planning Minister AHM Mustafa Kamal told journalists that under the Tk 12.78 billion 'Expansion of power distribution system and upgradation in west zone area project',

the West Zone Power Distribution Company Limited (WZPDCL) would cover new consumers upgrading its distribution system.

According to the project proposal, the state-owned WZPDCL will install 33-kilovolt capacity 1054.25 kilometres of distribution lines and 11-kv 62-km lines, 33/1-kv capacity 63 sub-stations and installation of 11/0.4 kv capacity 1722 distribution transformers by June, 2020.

The project will also help meet the growing demand of power due to building of the Padma Bridge and future economic zones and enhance the capacity of the existing power distribution system, officials said. **EP**



Prime Minister Sheikh Hasina presides over the ECNEC meeting

tional Power Transmission Network received Tk 360 crore for the countrywide grid network while 400/230/132 kV grid network project received Tk 335 crore aimed at improving transmission system in Dhaka, Sylhet and Chittagong region. Aminbazar-Mowa-Mongla 400 kV transmission line project received Tk 3480 crore.

Three power plant projects-Ashuganj (North) 450 MW combined cycle power project received Tk 260 crore

while Ashuganj (East) 400 MW project got 210 crore and Bheramara 360 MW combined cycle power project was given an allocation of Tk 745 crore.

Two power distribution projects were undertaken as fast track ones. Of them, a project for rural electrification to provide connections to 1.8 million new consumers received Tk 727.54 crore while another similar project to provide 1.5 million new rural consumers got Tk 359.20 crore. **EP**

Siemens Wins 130m Euro Order for India-Bangladesh Power Link

Siemens has bagged an order worth 130 million euro to set up a high voltage direct current (HVDC) link to connect power supply networks of India and Bangladesh.

"Siemens has received an order for an HVDC (high-voltage direct-current) back-to-back link to connect the power supply networks of India and Bangladesh," Siemens said in a press release recently.

The order value is about Euro 130 million and the power link is scheduled to come on

line in the second half of 2018, it said.

On a turnkey basis, Siemens will be responsible for engineering, installing and commissioning of the complete HVDC system, it added.

The customer is Power Grid Company of Bangladesh (PGCB).

Siemens has already installed block 1 of the Bheramara HVDC back-to-back station in 2013 and will now deliver a second block with a transmission capacity of another 500 MW.

EP

FBCCI to Finalize Japanese Investment Proposals in a Month

The Federation of Bangladesh Chambers of Commerce and Industry (FBCCI) will finalize Japanese investment proposals within next one month following a deal signed with JETRO recently.

The apex trade body has already asked its experts to identify the areas of prospective sectors for investment in Bangladesh by Japanese en-

trepreneurs.

The FBCCI and Japan External Trade Organization (JETRO) signed a memorandum of understanding (MoU) during the visit of Prime Minister Sheikh Hasina to Japan recently.

The JETRO, for the first time, inked an agreement with the private sector (FBCCI) of Bangladesh to boost Japanese investments in the country.

EP

Govt Looks to Double Profit from BPC Next Fiscal

The government wants to double the profit to Tk 50 billion (5,000 crore) from the once sickly state-owned Bangladesh Petroleum Corporation (BPC) in the next fiscal year (FY).

The government eyes the higher amount from the BPC on the back of its adequate profits made following the fall in prices of oils in the in-

ternational market.

However, the national exchequer already got Tk 18.20 billion against the target of Tk 25.0 billion in the revised budget of the outgoing fiscal year.

Officials said this is a big amount for them, as they are now funding many new projects.

EP

IEA Sees Oil Market Balance in 2016

The oil market is now in balance thanks to unplanned outages and robust demand, particularly from emerging economies, but this equilibrium will tilt into surplus again early next year, the International Energy Agency said recently.

The agency said in its monthly report that demand growth in 2017 is likely to reach 1.3 million barrels per day (bpd), the same level at which it estimates growth for this year, having revised up its May 2016 forecast of 1.2 million bpd.

"Again, on the planning assumption that Opec oil production grows modestly in 2017, we expect to see global oil stocks build slightly in the first half of 2017 before

falling slightly more in the second half of 2017. For the year as a whole, there will be a very small stock draw of 0.1 million bpd," the IEA said.

"At halfway in 2016, the oil market looks to be balancing; but we must not forget that there are large volumes of shut-in production, mainly in Nigeria and Libya, that could return to the market, and the strong start for oil demand growth seen this year might not be maintained," the Paris-based agency said.

Most of the anticipated demand growth this year and in 2017 is expected to come from nations that are not part of the Organization for Economic Cooperation and Development, the agency said.

EP

Petrobangla Gets No Opinion About LNG Import Policy from Local Firms

India's Reliance Oil & Gas is the lone organization that has submitted its opinion on the draft Private Sector LNG Import Policy.

The government is formulating the policy to encourage and facilitate import of LNG (liquefied natural gas) by private sector, Petrobangla officials said.

"We got opinion only from the Indian firm although we requested all concerned to send their opinions before finaliz-

ing the policy," a senior official of state-run Petrobangla said.

He said the final policy would be almost similar to the draft

as there was no opinion opposing it or recommendation to change the terms.

Petrobangla has already

sent the draft of the policy along with opinions to the energy and mineral resources division (EMRD) under the Ministry of Power, Energy and Mineral Resources (MPEMR) for final approval.

EP



Gazprom Eyes Bigger Share in India

Russia's Gazprom PJSC, the world's biggest natural gas producer, is stepping up supplies to India.

Alexey Miller, chairman of the Gazprom management committee, and Dharmendra Pradhan, India's petroleum minister, recently discussed the modalities for increasing Gazprom's gas sales in St Petersburg. Pradhan was accompanied by top executives from Petronet LNG, Indian Oil Corporation (IOC) and other public sector firms.

"During the visit to St Peters-

burg, (we) discussed various routes to bring Russian gas to India and cooperation in third countries. Also, (I) met Alexei Miller, CEO Gazprom, world's largest gas company. Gazprom is keen to work various gas projects with India," said petroleum minister Dharmendra Pradhan.

Pradhan also met top executive from Novatek, the second largest gas producing company of Russia, which also express interest to participate in Indian gas sector.

EP



Working meeting between Alexey Miller chairman of the Gazprom management committee, & Dharmendra Pradhan, Indian Minister of Petroleum and Natural Gas

India Taking Lead to Create Alliance of Gas Importers

India is taking the lead for creating an alliance of gas importers across the world for "reasonable and affordable" pricing of the fuel, Union Oil Minister Dharmendra Pradhan said.

"We must have a cooperation between all the LNG (Liquefied Natural Gas) and gas consuming countries, we must create a situation for a reasonable, rational and affordable price. India is taking the lead to create a network between

these major gas consumers," Pradhan told reporters.

Calling gas as an important fuel for the next two decades which will be an important constituent of the country's energy basket, Pradhan said the state-run Gail is taking the lead in the company-to-company negotiations at the international level.

It is already in touch with companies in Japan and South Korea, the Minister said,

India Plans LNG-Powered Barges on Ganges by 2018

India's Ministry of Shipping is setting about introducing Liquefied Natural Gas (LNG)-powered barges to its waterways, with the first barges proposed for navigation of the Ganges by end of 2018.

The Ministry recently followed up on the MOU between Inland Waterways Authority of India (IWAI) and Petronet LNG for providing an LNG based alternative, fuel efficient and environment-friendly mode of transport on National Waterways.

The MoU, signed at the Maritime India Summit in Mumbai in April, 2016, has the

objective to promote the usage of LNG Barges on National Waterway-1 (Ganga or Ganges). Up to 17.5 MT of cargo is expected to be transported on NW-1 by 2020.

Both the options of switching over from the existing diesel to LNG barges and introduction of new LNG barges are being considered.

Although the switching over from traditional fuel (diesel) to LNG will entail an initial capital expenditure, the investment is likely to be recovered in four to five years at current prices.

EP

OPEC Keeps Global Oil Demand Forecast Unchanged

The Organization of the Petroleum Exporting Countries kept recent forecasts for global oil supply and demand unchanged after its members broke off a meeting earlier last month without reaching an agreement on oil output.

Global oil demand will increase by 1.2 million barrels a day this year to 94.18 million, led by India, the group's Vienna-based research department said in the monthly report.

Non-OPEC production will fall by 740,000 barrels a day from 2015 to 56.4 million barrels a day this year. The downward revisions in Canada, Brazil and Colombia broadly offset upward revisions

in the U.S., U.K., Russia and Azerbaijan.

OPEC forecast U.S. production this year will fall by 420,000 barrels a day from 2015 to 13.57 million barrels a day. Total U.S. output will decline by 150,000 barrels a day in the second half of this year compared with the first half as producers cut production that is become unprofitable with the low oil price environment.

OPEC broke off its meeting earlier this month in Vienna without reaching an agreement on oil output, continuing a hands-off policy that members say could set up a new test for the group's relevance: shortages.

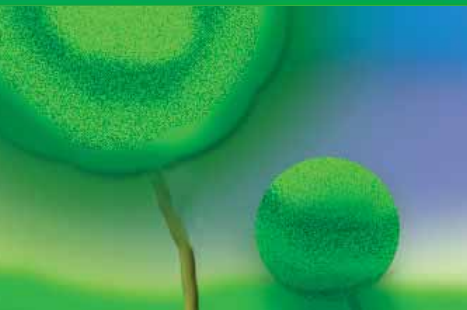
EP

adding that China can also be a partner in the future.

Pradhan added that according to some estimates, India and

China will account for 90 per cent of the incremental gas demand in the next two decades.

EP



Green page

Patronization Can Make Renewable Energies Accessible to People

All the government and non-government organizations concerned should come forward and patronize the sector of renewable energies for best uses of its existing potentialities, speakers at a public dialogue here said.

They highlighted the enormous aspects of the sector in both rural and urban areas of the region including its vast Barind tract and said there should have adequate measures of making those accesses to the poor and marginalized population.

Bangladesh Resource Center for Indigenous Knowledge (BARCIK), a collective initiative for participatory research, policy advocacy and campaign, organized the dialogue styled "Energy and Poverty and Poor Peoples Participation to Renewable Energies" held at Tanore Upazila Parishad auditorium recently.

During his keynote presentation, Shahidul Islam, Barind Region Coordinator of BARCIK, mentioned instead of depending on only the fossil fuel emphasis should be given on enriching the renewable energy sources to face the energy challenges.

Availability of energy from different sources is vital for the present life in meeting the challenge of the ever-increasing demand for energy. He emphasized the need for wide-ranging use of energy efficient products to reduce the existing pressure on power demands.

EP

World Bank Helps Spread Solar Home Systems in Bangladesh

The World Bank, under its renewable energy promotion scheme, has so far supported installation of 3.9 million solar homes systems across the country which benefited over 20 million people.

The success came when Rural Electrification and Renewable Energy Development II (RERED II) Project is running and the first phase had already been completed.

The state-owned Infrastructure Development Company Limited (IDCOL) in partnership with NGOs, is implementing the project that provides electricity in rural remote villages of Bangladesh through solar power and renewable energy

sources.

The project also introduced and installed 321 solar irrigation pumps and seven renewable energy-based mini-grids across the country, WB sources said.

With replacing more expensive diesel-run irrigation pumps, these solar pumps benefited more than 8,000 farmers by reducing their irrigation costs, the WB claims.

The seven renewable energy-based mini-grids have a combined capacity of 966kw power. There mini-grids supply electricity in the remote locations of Swandip, Kutubdia, Bagha and Godagari in Rajshahi, Paratoli in Narsingdi, Nageshwari in Kurigram, and Monpura in Bhola.

Nine more mini-grids with a combined capacity of 1,071kw are under construction. The project will soon start constructing four more mini-grids with aggregate capacity of 736kw.

EP



Solar Pumps Set to Bring Agri Revolution to Rajshahi

A massive agricultural revolution is expected in greater Rajshahi region as the Barendra Multipurpose Development Authority (BMDA) has set up four irrigation pumps driven by solar power at different areas of Godagari upazila in Rajshahi.

As a result, the farmers would be able to provide irrigation with those pumps and cultivate crops throughout the year. Be-

sides, it would reduce power consumption.

The BMDA authority claimed that at least 2,000 bighas of land across the upazila would be brought under the cultivation of different crops and vegetables throughout the year.

According to BMDA sources, Godagari Zone-1, the authority has set up four such pumps at Zogpur, Birill-Sormongla Khari, Gopalpur and Poldevpur areas in the upazila.

EP

Remote Islands to Get Solar Mini-Grids

The government has planned to set up 50 solar mini-grids in remote off-grid areas of the country, mainly in islands, by 2018.

Of the planned mini-grids, seven have already been installed while 11 are under the installation process, while the remaining 32 are at the planning stage, according to official sources.

"Each of the mini-grids will have 100-250 kilowatt load capacity for serving 500-1200 households and commercial consumers," said Enamul Karim Pavel,

head of Renewable Energy of IDCOL, a state-owned financing agency.

All these mini-grids are being set up by private sector partner organizations (PO) of the IDCOL, each requiring an investment of Tk 4-9 crore depending on the size and capacity.

A solar mini-grid plant means there will be an integrated solar system containing a battery storage system alongside a backup by diesel-fired generator. Initially, electricity will be generated from a solar hub and then it will go to consumers through a distribution lines during the daytime.

The battery system will work as power storage to supply electricity during the night time. During any rainy day, diesel-fired generators will provide the backup support.

EP



Renewable Energy to Attract Two-Thirds of Power Plant Investments

Renewable energy sources such as wind and solar will attract two-thirds of all investment in power-generating plants between 2016 and 2040 in spite of persistently cheap coal and gas prices, a new report has found.

The forecast by Bloomberg New Energy Finance, the energy research unit of information company Bloomberg, expects some \$7.8 trillion to be invested glob-

ally in renewables over the period, compared with \$1.2 trillion for new coal plants - largely in India and other Asian emerging markets.

Gas will attract a relatively small \$892 billion, it said, despite a projected glut of the fuel leading to lower power generating costs.

"One conclusion that may surprise is that our forecast shows no golden age for gas, except in North America," according to report co-author Elena Giannakopoulou.

"As a global generation source, gas will be overtaken by renewables in 2027. It will be 2037 before renewables overtake coal," she said.

EP



Greenpage

Denmark is Schooling the US on Going Green

In this fraught election year, it may seem a novel concept, bipartisanship. Yet in Denmark, where so many progressive ideals seem made manifest, it's virtually a given – at least where global warming's concerned.



Lars Gert Lose

"No matter what government you have, whether it's a left-wing government or right-wing government, they almost always agree on climate policies," says Lars Gert Lose, Denmark's ambassador to the United States. "Those goals are, to some extent, fixed."

Even as U.S. conservative lawmakers continue to deny climate change exists – including the chairman of the Senate Environment and Public Works Committee – Denmark's plunging ahead in investing in green energy: Wind generates 42 percent of the country's electricity, the nation plans to slash its heat-trapping carbon dioxide emissions by more than a third in the next decade, and Denmark ranks as one of the globe's top exporters of renewable energy technology.

And despite reports last fall that the country's new government was considering abandoning its predecessor's pledge to wean the country off fossil fuels by 2050, Lose says that ambition remains on the table, calling it "perhaps the most important goal in Denmark that we have set ourselves."

All the while, the country's economy has grown, swelling by nearly 80 percent since 1980 as Danes enjoy high per-capita income and relatively narrow income disparities.

EP

Average Costs for Solar & Wind Electricity Could Fall 59% by 2025

The average costs for electricity generated by solar and wind technologies could decrease by between 26 and 59 per cent by 2025, according to a report released recently by the International Renewable Energy Agency (IRENA).

The report, *The Power to Change: Solar and Wind Cost Reduction Potential to 2025*, finds that with the right regulatory and policy frameworks in place, solar and wind technologies can continue to realize cost reductions to 2025 and be-

yond.

It estimates that by 2025, average electricity costs could decrease 59 per cent for solar photovoltaics (PV), 35 per cent for offshore wind, and 26 per cent for onshore wind compared to 2015.

Electricity prices for concentrated solar power could also decrease as much as 43 per cent, depending on the technology used. By 2025, the global average cost of electricity from solar PV and onshore wind will be roughly 5 to 6 US cents per kilowatt hour.

EP

India's Tata Power to Buy \$1.4bn Renewables Portfolio

Tata Power Company Ltd. agreed to buy a 1.1-GW solar and wind portfolio from Welspun Renewable Energy Pvt in India's biggest clean energy deal, according to an exchange filing.

The transaction values Welspun's assets at 77 million rupees per MW, Tata Power's Chief Executive Officer Anil Sardana said in Mumbai recently. The acquisition's enterprise value is 92.49 billion rupees (\$1.4 billion), of which the debt component is \$820 million, he said.

The acquisition "will give us better re-

turns and lesser risk," Sardana said in a broadcast briefing. "It's strategic

and tactical for Tata Power."

Welspun's renewable assets will boost capacity of Tata Power's renewable energy unit to about 2.3 GW, according to the filing.

In addition to the 294 MW of wind and solar already under management, Tata Power is transferring another 500 MW of renewable projects onto the books of Tata Power Renewable Energy Ltd. Another 400 MW of solar and wind projects are being implemented.

EP

Solar Energy Sector Could Create 7,300 Jobs

The Irish Solar Energy Association (ISEA) has called on the government to introduce a support mechanism for solar power.

Solar power is currently the only renewable energy technology that does not qualify for any form of a subsidy in Ireland.

The ISEA said the deployment of solar power in Ireland will see the creation of over 7,300 high-value jobs throughout the country.

It also said it will help save the country from EU fines in excess of €300m a year from 2020.



An independent KPMG report has estimated that the Irish solar sector can deliver €2 billion in gross value added (GVA) for Ireland and return €800m in tax revenues by 2030.

The association said that in the first two weeks of June, a commercial rooftop installation in the south-east of the country generated

16,000 units of renewable electricity.

It said this means an established solar energy sector with 2 GW capacity would have produced 7% of the country's total electricity needs.

EP

Greenpage

Solar Head of State Emboldens Energy Ministers

Solar Head of State (SHOS) is exhibiting recently at the seventh Clean Energy Ministerial (CEM7) Solutions Showcase held in Union Square, San Francisco.

The display, in partnership with Sungevity and the California Clean Energy Fund, aims to persuade the energy ministers from the 23 countries in attendance to commit to installing solar photovoltaic panels on national executive residences as a display of commitment to a clean energy future.

CEM7 will bring the global energy policymakers together with visionaries from the business and investment communities and other clean energy experts to drive high-impact, real-world action.



The ministers attending represent over 90% of clean energy investments worldwide and 75% of global greenhouse gas emissions.

Danny Kennedy, Managing Director of the California Clean Energy Fund, said, "CEM7 is a great opportunity for energy ministers of the world's leading economies to learn about new technology and initiatives. We hope they will take the chance to join the Solar Head of State program, as these installations can have profound impacts by raising public and political awareness of solar technology."

EP

Suitable Coal Mining Method for Bangladesh

Engr. Anwar H. Khan

Recently, a day-long seminar titled “Appropriate Method of coal Mining in Bangladesh” was held in Dhaka to gather suggestions, views or comments from the experts working in the oil, gas and mineral sector of the country along with the experts associated with this sector long back. Officials including the Managing Directors, Directors, General Managers and other senior officers from Petrobangla, BCMCL, MGMCL & GSB, IWM & BMD along with some other professionals participated in the seminar. Key-Note papers were presented, followed by open discussion of other participants presenting their views or suggestions regarding the mining method. Hydrocarbon Unit (HCU), the Technical Wing of Energy & Mineral Resources Division, arranged the seminar.

Coal Mining in Bangladesh

Besides natural gas, Bangladesh has significant coal reserves of about 3.1 billion tons comprising of 5 deposits at depths between 118-1158 meters in the north-western part of Bangladesh. So far, coal is being mined only from Barapukuria Coal Mine. Bangladesh has entered into the era of coal mining through the development of Barapukuria underground mine with projected output of 1 million tones per annum for 25-30 years. Detailed geological, geotechnical, social and environmental studies following international standards have been completed for the Phulbari coal field. Jamalganj coal field with significant resource (>1 billion tones) is so far not considered technically and economically feasible for mining due to the depth (>600m). Other two coal fields – Khalashpir and Dighipara – are not systematically assessed and significant efforts will be required to define the mineable reserve and the method of mining and associated issues.

Bangladesh coal is of good

quality but considering other major coal producing countries, the reserve is pretty limited – almost equivalent to the annual production of China. Therefore, mining method has to be appropriate to maximize the recovery taking into consideration of geological along with hydrological reality of the coal fields and economic viability and energy needs of the country. Underground mining experience at Barapukuria has already demonstrated that coal extraction with this method is not a sustainable solution, and will not meet the required demand for the country. It is uneconomic and will lead to loss of valuable resources of the country. Considering the limited reserve and fast growing primary energy market, open pit mining may be taken into consideration as logical option for coal development.

Observations

Considering the future development of coal sector of the country, information available from the presentations made by the experts and views of participants from the seminar, following observations could be made:

The coal mining method depends on many technological, economic and social factors:

(i) The technological factors include the number of seams, the thickness and steepness of each seam, the nature and thickness of the strata overlying the seams, the quality of the coal seams, the

surface topography, the surface features and the transportation networks available.

(ii) Economic factors include energy demand and its growth, the supply and cost of alternative sources of energy, coal quality and the cost of coal preparation, the selling price of coal, advancements in technology that affect costs of production and environmental legislation.

(iii) Social factors include prior history of mining in the area, ownership patterns, availability of labor and government support.

It is understood that technological factors dictate a clear choice of mining method, whereas economic and social factors determine whether a coal reserve will be mined at all.

Both open pit and underground are well established and practiced mining methods all over the world for extraction of coal. But the choice of mining method depends on basin geology and economic viability of extraction of the deposit. Social and environmental impacts of mining are also important consideration. Generally open pit mining method is preferred for appropriate geotechnical conditions of a coal deposit as it maximizes the resource recovery and offers better economics and surplus revenues for environmental and social care related to mine development.

Conclusion

Bangladesh already has the experience of underground coal mining. The option for open pit mining should be evaluated at least for one coal field as ‘pilot scheme’ with introduction of state of art technologies and best practice mitigation measures of mining world.



Engr. Anwar H. Khan;
Energy & Management
Consultant

How a Coal Power Plant Works?

A.H.M. Zafrul Hossain

Coal is being used for electricity production to power appliances. This form of energy for generating electricity is being used due to its affordability. Coal plays a vital role in electricity generation worldwide. Coal has one of the largest reserves as an energy source. Coal plays a vital role in electricity generation worldwide. Today, Coal-fired power plants, also known as power stations, provide over 42% of global electricity supply.

How Is Coal Converted to Electricity?

Steam coal, also known as thermal coal, is used in power stations to generate electricity. Coal is first milled to a fine powder, which increases the surface area and allows it to burn the powdered coal is blown into the combustion chamber of a boiler where it is burnt at high temperature to heat water to produce steam. The steam, at tremendous pressure, flows into a turbine, which spins a generator to produce electricity. The steam is cooled, condensed back into water, and returned to the boiler to start the process over.

The high pressure steam is passed into a turbine containing thousands of propeller-like blades. The steam pushes these blades causing the turbine shaft to rotate at high speed. After passing

through the turbine, the steam is condensed.

Efficiency Improvements

Improvements continue to be made in conventional PCC power station design and new combustion technologies are being developed. These allow more electricity to be produced from less coal - known as improving the thermal efficiency of the power station. Efficiency gains in electricity generation from coal-fired power stations will play a crucial part in reducing CO₂ emissions at a global level. A one percentage point improvement in the efficiency of a conventional pulverized coal combustion plant results in a 2-3% reduction in CO₂ emissions.

Coal combustion releases nitrogen oxides, sulfur dioxide, particulate matter (PM), mercury, and dozens of other substances known to be hazardous to human health. Burning coal, such as for power generation, gives rise to a variety of wastes which must be controlled or at least accounted for. So-called 'clean coal' technologies are a variety of evolving responses to late 20th century environmental concerns, including that of global warming due to carbon dioxide releases to the atmosphere. However, many of the elements have in fact been applied for

many years.

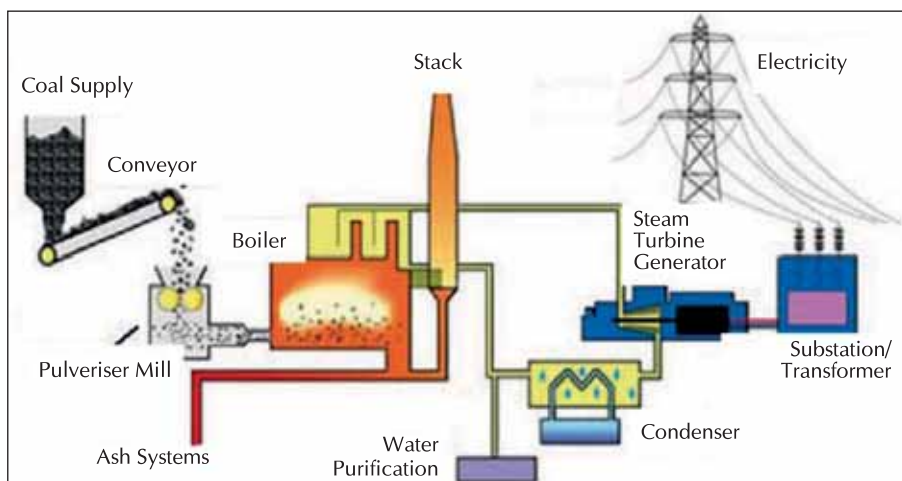
Coal cleaning by 'washing' has been standard practice in developed countries for some time. It reduces emissions of ash and sulfur dioxide when the coal is burned. Electrostatic precipitators and fabric filters can remove 99% of the fly ash from the flue gases – these technologies are in widespread use.

Flue gas desulfurization reduces the output of sulfur dioxide to the atmosphere by up to 97%, the task depending on the level of sulfur in the coal and the extent of the reduction. It is widely used where needed in developed countries. Low-NO_x burners allow coal-fired plants to reduce nitrogen oxide emissions by up to 40%. Coupled with re-burning techniques NO_x can be reduced 70% and selective catalytic reduction can clean up 90% of NO_x emissions.

Techniques NO_x can be reduced 70% and selective catalytic reduction can clean up 90% of NO_x emissions. Increased efficiency of plant – up to 46% thermal efficiency now (and 50% expected in future) means that newer plants create less emission per kWh than older ones.

Advanced technologies such as Integrated Gasification cation Combined Cycle (IGCC) and Pressurized Fluidized Bed Combustion (PFBC) enable higher thermal efficiencies still – up to 50% in the future. Ultra-clean coal (UCC) from new processing technologies which reduce ash below 0.25% and sulfur to very low levels mean that pulverized coal might be used as fuel for very large marine engines, in place of heavy fuel oil. There are at least two UCC technologies under development. Wastes from UCC are likely to be a problem. Gasification, including underground coal gasification (UCG) in situ, uses steam and oxygen to turn the coal into carbon monoxide and hydrogen.

EP



A.H.M. Zafrul Hossain;
XEN, EGCB Ltd.
Siddhirganj 335 MW CCPP

3R Strategy for Waste Management

Environment and Forests Minister Anwar Hossain recently said the government has adopted various measures, including formulation of the National 3R (Reduce, Reuse, Recycle) Strategy for Waste Management, for protecting Dhaka City from environment pollution.

"Department of Environment, Chittagong and Dhaka South and North City

Corporation have been running a pilot project for implementation of the concept of National 3R," he said while replying to a question from opposition bench member Begum Salma Islam of Dhaka-1 in the Jatiya Sangsad.

The minister said the city corporations concerned have

been working for an environment friendly management of the wastes produced at hospitals/clinics in the Dhaka city by collecting those through a private organization.



Anwar Hossain

Besides, the Department of Environment has been monitoring markets, holding meetings with market committee leaders and building awareness among the common people to discour-

age using the banned polythene, he said.

Anwar Hossain told the House that the Department of Environment also seized 2,42,613-kilogram polythene and fined violators of the environment law Taka 2,90,80,606 by conducting 664 mobile courts last year.

EP

Norway to Become Climate Neutral by 2030

On June 15, Norway's Parliament approved a national goal to achieve climate neutrality by 2030, accelerating the initial 2050 target.

Based on the recommendation from the Environmental Committee, the Parliament approved a resolution to achieve climate neutrality "from 1 January 2030" "through the EU emissions trading market, international cooperation on emissions reductions, emissions trading and project-based cooperation".

The motion has passed with 54 votes in favor and 47 against, faced with opposition from the ruling parties of the minority government.

Norway's road to climate neutrality relies completely on carbon offsets, excluding any measures to reduce emissions domestically. The biggest share of GHG emissions in Norway belongs to oil and gas industry, amounting to 14% in 2014.

In his speech to the Parliament, the climate minister,

Sustainable Energy for All Shifts Gear to Speed Delivery of Affordable, Clean Energy

Sustainable Energy for All – the global, multi-stakeholder platform that played a core role in putting universal access to modern energy services at the heart of the Sustainable Development Goals (SDGs) and Paris climate agreement – is shifting gear with a new five-year strategy that will drive action and deliver on those promises.

The Strategic Framework for Results 2016-21, titled 'Going Further, Faster', was backed today by Sustainable Energy for All's Advisory Board of high-level figures from the public and private sectors and civil society, co-chaired by UN Secretary-General Ban Ki-

moon and World Bank Group President Jim Yong Kim.

"The new Sustainable Energy for All strategy provides a powerful tool for delivering on the promises of the Sustainable Development Goals and the Paris Agreement. Affordable, clean energy is the golden thread that links economic growth, increased social equity and a healthy environment," Secretary-General Ban said.

"To achieve universal access to clean, affordable energy we need to unlock hundreds of billions of dollars in finance," said President Kim.

EP

Scientists Turn CO₂ into Stone to Fight Climate Change

Carbon dioxide has been pumped underground and turned rapidly into stone, demonstrating a radical new way to tackle climate change.

The unique project promises a cheaper and more secure way of burying CO₂ from fossil fuel burning underground, where it cannot warm the planet.

Such carbon capture and storage (CCS) is thought to be essential to halting global warming, but existing projects store the CO₂ as a gas and concerns about costs and potential leakage have halted some plans.

The new research pumped CO₂ into the volcanic rock

under Iceland and sped up a natural process where the basalts react with the gas to form carbonate minerals, which make up limestone.

The researchers were amazed by how fast all the gas turned into a solid – just two years, compared to the hundreds or thousands of years that had been predicted.

"We need to deal with rising carbon emissions and this is the ultimate permanent storage – turn them back to stone," said Juerg Matter, at the University of Southampton in the UK, who led the research published recently in the journal Science.

EP

Vidar Helgesen, pointed out towards a need for a rapid ratification of the Paris Agreement. Following the

discussion, the motion for ratification was unanimously supported in a plenary vote.

EP

Climate Change Triggers Drought, Flood in Barind Tract

Adverse impact of climate change has been triggering natural disasters including drought and flood posing a serious threat to the overall public health especially relating to water and sanitation in the region including the vast Barind tract.

To face the natural catastrophe, substantial and sustainable promotion of water and sanitation related modern technologies have become indispensable as the vulnerable water and sanitation situation is closely associated with the climate change.

Professor Dr Asaduzzaman from Department of Geography and Environmental Sciences in Rajshahi College

revealed this while presenting his keynote in a seminar.

District Disaster Management Committee and Department of Disaster Management jointly organized the seminar titled "Drought and Flood" held at the conference hall of Deputy Commissioner in Rajshahi recently.

Keynote presenter Dr Asaduzzaman told the meeting that the common consequences of drought such as dust storms due to desertification, eroding landscapes, less crop growth due to lack of water for irrigation, malnutrition, dehydration, habitat damage now being observed in the dried region. **EP**

Clean Energy Ministerial Secretariat Finds New Home at the IEA

The International Energy Agency (IEA) has announced that a new, multilateral Secretariat for the Clean Energy Ministerial (CEM) will be established at the IEA later this year.

The CEM is a high-level forum of many of the world's economies working together to accelerate the global transition to clean energy.

"The choice of the IEA as the home of the new CEM Secretariat is a 'win-win' for everyone involved," said IEA Executive Director Fatih Birol.

In November 2015, the IEA

Ministers gave us a clear mandate to strengthen the clean-energy technology and innovation-related activities of the Agency and also to 'open our doors' to increase our engagement with major emerging economies.

The IEA's 29 member countries have now accepted the proposal to transition the CEM Secretariat to the IEA. The decision follows CEM members selecting the IEA – from a short-list of other international organizations – as their preferred home for the CEM Secretariat at their recent Ministerial meeting in San Francisco on 1-2 June. **EP**



The meetings were preceded by a consultation with CSOs on 6 June, as well as a meeting of the Scientific and Tech-

nical Advisory Panel (STAP).

GEF Chief Executive Officer (CEO) and Chairperson Naoko Ishii and Caroline Leclerc (Canada) served as Co-Chairs for the meetings.

The LDCF/SCCF Council convened for its 20th meeting on 9 June, and considered a progress report on the funds as well as the 2015 Annual Monitoring Review and 2015 Annual Evaluation Report of the Funds, and Work Program and budgets for 2017. **EP**

GEF Council Approves Programs of \$400m

The GEF Council approved a work program comprising 38 project concepts and four programmatic frameworks, with total resources amounting to US\$398.68 million. The programmatic frameworks include a Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development and a project on Leapfrogging Markets to High Efficiency Products.

In addition, the 50th meeting of the GEF Council also established a new trust fund for the Capacity-building Initiative for Transparency (CBIT).

The 50th meeting of the Global Environment Facility (GEF) Council was convened in Washington from 7-9 June 2016, at World Bank head-

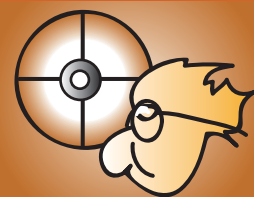
quarters.

The meeting marked the occasion of the 25th anniversary of the GEF. Representatives of governments, international organizations and civil society organizations (CSOs) attended the three-day meeting, which also included the 20th meeting of the Council for the Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF).



REVISED PSMP: LET'S HOPE FOR THE BEST

Reverse Swing



Farid Hossain

A revised master plan on power and energy (it's yet to be finalized) is presenting a new picture and a shift in the focus. The revised Power Sector Master Plan is expected to be a final document by end June. The plan has an amended estimate of power demand and generation by 2041, the year Prime Minister Sheikh Hasina has set to turn Bangladesh into a developed economy.

The draft of the revised PSMP has put the electricity demand to soar to 52,000 MW in 2041 with generation capacity estimated at 57,000 MW. This time the focus has been put on import. According to the plan, as reported in this magazine, 46,000MW to 48,000MW would come from mostly imported energy and electricity. Local coal will account for only 1 plus percent in the total generation. The first master had focused on the greater use of local coal in the generation of electricity. The new plan looks like a deviation from that plan. It shifts the attention more to the imported coal. The government seems to have adopted a policy of preserving the local coal and instead go for imports.

Bangladesh Power Development Board (BPDB) Chairman Shamsul Hassan Mia defends this shift saying the energy infrastructure of many countries in the world is dependent on import.

"If they can develop through imports, why can't we," he was quoted as saying

by this magazine. Well and good. If others can Bangladesh should not fail. Relying on imports should not be a major issue if some key conditions are met. First, the coal should be available for import and second, the price has to be competitive and fair so the electricity price also remains competitive. If it is found that mining of the country's own coal reserves (which are said to be huge) proves costlier than the imported coal then the import plan sounds good and logical. However, there has to be accurate assessment of the quantity of coal to be available for import. It also involves a proper assessment of the changes that may occur in the global coal market and the uncertainty associated with the trade.

One painful aspect is, meanwhile, clear. The country's available natural gas reserve has been declining and the authorities have failed to offer anything that can make the country hopeful about new gas find. Good to see that the cost of importing oil has come down as the global oil prices have plummeted. The country's oil-based electricity generation has thus got a breather. It has also contributed in

keeping the generation cost of electricity under control. The lower prices of imported oil have recently encouraged the government to cut the prices of fuel oil. In the field of electricity generation the government is lowering its attention on the oil-based plants. It's better to shift to other options like coal (imported or local), nuclear power and solar energy.

Works on some coal-based power plants are under way, even though a couple of them are facing protests from environmental activists. Rampal power plant project, a joint venture of Bangladesh and India, will have to pacify the environment activists who see it as a threat to the Sundarbans, the world's largest mangrove forest. Not far from the Rampal project couple of other coal-based power plants are about to launch their work making the Bay of Bengal a hub of power generation. These upcoming power plants will be coal-based.

With progress in the coal field, Bangladesh is eagerly looking forward to the Rooppur Nuclear Power Plant, a long-dreamt project being implemented with the assistance from Russia. The nearly \$13billion project has two units each having capacity of generating 1,200MW. The first unit is expected to be in operation by 2023.

Authorities insist that the revised master plan has taken all aspects _ the odds and possibilities _into account. Let's hope for the better.



'Land for Big Infrastructure Needs Govt Guarantee'

The government will have to ensure availability of land for all large infrastructure projects, including energy sector ones -- be it in the public sector or private. The implementation of any large project in future will become impossible if there is any withdrawal after starting. Local community must be integrated during the execution of any project. There must be showcasing how the project will bring long-term benefits. Executive Director of Policy Research Institute Dr Ahsan H Mansur said this while talking to Energy & Power. He thinks that there is no other option but to import primary fuel if local resources are not adequate. He also thinks local natural gas availability now is less than required volume; coal is not being extracted for political reasons. Consequently, Bangladesh has no other alternative but imported fuel.

Mansur said this in an exclusive interview with EP Editor **Mollah Amzad Hossain**. Following is the extract of the interview:

EP: How do you evaluate the present scenario of Bangladesh Energy sector?

AM: Natural gas is our lone source of local primary fuel. We have discovered coal resource. The extraction and use is economically profitable. But for political reasons we are unable in taking decision. Coordinated efforts for exploring new gas resources could not also be done.

We cannot say that using imported coal at the present global price will have much price impact. But we could not reach the stage for concluding any contract so far for coal purchase. The

works for setting up coal import infrastructure also could not be started yet. We do not get exact idea about the impact of imported coal before these are finalised. A coal port construction in Matabari is possible but for Rampal Plant, coal needs to be transhipped in lighterage vessels from mother vessels to be anchored in the deep sea. This will add to cost. Hence, it is very difficult to say anything definitely about energy sector of Bangladesh now. We have to wait till the future fuel mix is finally determined.

EP: The government had to set up about 2,200 MW liquid fuel based power plants as contingency measure for confronting crisis at the initial stage. Again tender has been floated for another 1,000 MW liquid fuel using plants. What are your views about this?

AM: There was no other alternative but to go for contingency liquid fuel using plant option. But after seven years of the government, such initiative is not acceptable at all. A vested group has been created around this contingency action. They influence political economy. For that reasons possibly, the government is again going for 50-100 MW liquid fuel based plants. This cannot be supported at all.

EP: The government has vision for achieving mid-income and developed economy status. But energy and power supply for industry remains uncertain. Gas supply is very much inadequate for the industries in operation. How do you look at it?

AH: The reality is that we do not have any other alternative fuel than own coal. We are not going for it. The pres-



Dr Ahsan H Mansur

In the present scenario interrupted & quality power is not being supplied. It is not also possible without modern transmission & distribution network. We have to give due attention to these segments of power value chain. It is good that government has realised this though a bit late.

ent gas production is way below the demand. We are not optimistic also of discovering any large gas field in the foreseeable future. The initiatives now being taken for exploration using BAPEX and IOCs may take 5-8 years to bring any fruit. I do not find any other option but to go for primary fuel import in this situation. We have to go for both – importing primary fuel and also power. The draft PSMP has stressed upon emphasis for cross border trading. I think if Bangladesh can manage joint investment in Nepal and Bhutan, it will be possible for getting power at affordable price.

The cost of imported coal at present market price will also be affordable.

But the price will increase as the global crude oil price increases. The industry sector has to advance keeping this reality in mind.

EP: What is your opinion about the budgetary allocations proposed for energy and power sector?

AH: I think the provision of subsidy for energy sector in the budget is all right. We cannot afford taking out subsidy from energy sector as yet. But liquid fuel does not need any subsidy now. But the power sector is still not making profit. Hence subsidy for this sector is justified, but it must be adjusted in phases.

Though less than last budget, yet the allocation for power and energy sector is sizable. The investment in this sector is not dependent on budgetary allocation only. There is huge private sector investment here. So it will not be correct to evaluate the development of power sector from the point of view of budget allocation. We have to look at overall perspective.

EP: Finance Minister in the parliament has announced that LNG import would start in 2018 and gas supply to industries can be given as per demand. He also said that power supply according to demand will also continue. Can our industries maintain the competitive edge of its products with more expensive gas from LNG?

AH: In the present scenario interrupted and quality power is not being supplied. It is not also possible without modern transmission and distribution network. We have to give due attention to these segments of power value chain. It is good that government has realised this though a bit late.

Spot price of LNG now is within the affordable limit. But such low level may not be lasting long when crude price again reaches US\$60/bbl. I suggest that the government should immediately conclude agreement with LNG suppliers for short and long term LNG purchase.

I also consider that import of LNG should be opened to private sector

alongside the public sector. An Asian price index can be set linking it with crude oil price. If LNG price goes higher local industries will have no option to avoid it. They must be ready for it with their planning process.

EP: The adoption and implementation of mega projects have to hurdle over many barriers. This is more applicable in case of energy projects. How do you look at it?

AH: This is not only for energy projects alone. Local communities are fuming with discontent wherever land acquisition and land purchase are required for any project. After Phulbari project, Rampal, Bashkhali and finally specialised industrial zone project in Sylhet have experienced resistances from local communities. The dense population of the project areas are among reasons for these protests. But if we want development, then not only for energy projects, we have to endure some pains for any project. The government has to use its political skills to motivate the community. There has to be definite plans for rehabilitating the affected communities. We must remember once started there must not be any back out. If that happens, similar crisis will continue happening for all future projects.

I believe capital dredging of four major rivers – Padma, Meghna, Jamuna and Brahmaputra – can create huge lands on the riverbanks. The large industries and infrastructure projects can be set up there. The better navigability of the rivers will facilitate smoother transportation of raw materials and finished products. Consequently, industrial entrepreneurs will have added incentives for investment.

The government must regularly monitor the mega projects. If any problem arises, it can be resolved amicably through continued consultation with local communities. If there is any objection from environmentalists or civil societies, the rationale of that objection should also be reviewed.

EP: What do you think the government and entrepreneurs should do now?

AH: The government is responsible for providing the land for any project whether is of public sector or private. The acquired land has to be handed over through the local administration to the project developer. The government must use its political party and front in convincing local community if any disputes arise. There is no other option but expanding job opportunities through industrialization for achieving the mid-income country status. The government has initiated actions for setting up 100 specialised industrial zones in different regions of Bangladesh, apart from energy projects. But without government's guarantee against lands, no such projects can be implemented. All pros and cons must be taken into consideration before adopting any project. There must not be any fall back after launching a project.

EP: How the environmentalists and political activists can be motivated? In their protest against Rampal Power Plant, they asked as to why the plant needs to be built near the Sundarbans mangrove forest. Why not in other place? That group is trying to agitate the local community now at Bashkhali. What are your views?

AH: I have mentioned this earlier already. It is very difficult to say what the government should or should not do? We must remember all projects need to take for the interest of the country and its people. So the government must contain all such objections and protests objectively through political motivation, convincing the people of the long-term benefits these projects will create. These must be done in credible manner how the community will be ultimately benefitted.

Immediately on launching any project, side by side a comprehensive plan for works for community health care, schools development, training facilities for local community for future job creation must be developed with consultation of the local community. It will be easier to integrate local community with mega projects if such initiatives proceed with the progress of the

projects.

EP: In the preparatory stage of the Phulbari project, Asia Energy had extensive community contacts. People also responded positively during feasibility study. Do you think the Phulbari crisis is the outcome of any conspiracy?

AH: I believe that it could be a very good project from the economic point of view. I am not sure why it could not be implemented. Possibly the government did not showcase this project to local community before the project was launched. Consequently, the opposition group who did not want the project could create trouble there. This is the consequence of indecision on the part of the government. The initiative for local coal exploration was put on hold with this.

EP: Barapukuria mining could proceed after paying right compensation when it also ran into crisis. What are your views about this? Some confusions and controversies being created about coal fired power generation. But one such plant is in operation at Barapukuria. Local people have no issues against it. Why the government is not using it as a motivational matter?

AH: Look I do not think Barapukuria project was at all a financially viable project. Land subsidence has completely changed the land feature there. But right planning and application of open pit mining at Barapukuria and Phulbari could recover majority of the affected land after mining. But for political reasons we have failed to do that.

I think we must take decision about mining own coal right now. If this is not done now, global reality would make us leave coal buried under surface for ever. From economic point of view appropriate decision must be taken now without any further delay. I think political consideration and indecision are prevailing over earnest intention for coal mining.

On the other hand, local community have not raised any alarm about pollution from Barapukuria coal fired power plant. The persons who are raising ob-

jections can visit the plant area. The government can take initiative for that.

EP: Prof M Tamim has recently claimed that if local coal is not extracted and exploited, Bangladesh would become 92% dependent on imported primary fuel in achieving the projected power generation of PSMP. Do you think so?

AH: We have to import fuel if we do not have our own. There is no alternative. Many countries of the world have ensured their industrialization and economic development importing fuel from abroad. I think that the pricing policy is appropriate and imported fuel would keep the pace of economic development dynamic. It should not create great difficulties.

EP: Will you then suggest for mining own coal?

AH: Mining own coal will be the most beneficial for meeting the primary fuel demand. The reasons being that although imported coal may be having affordably lower price now but mine mouth power plant can generate cheaper power. The huge investments required in setting up import infrastructures for coal would add to the cost of power generation.

Rest of the world is gradually coming out of coal. If we are at all interested in mining our own coal, the right time is now. If we miss the opportunity, we may miss it forever.

EP: Do you think government is on the right track in energy sector?

AH: I think yes they are. But there are huge gaps between plans and implementations. The necessary amendments must be made in strategic areas and implementation process must be invigorated.

EP: Investment is a huge challenge in the energy sector. What should the government do for this?

AH: Yes investment is a major challenge for implementing the mega plans. The government would need 60-70 billion US\$ in investment over the next 10-15 years in the energy sector. There should not be major problem if the government can work in coordination with donor countries, development agencies and private sector. But we must keep in mind that fuel price must also be market based for attracting major investment.

EP

Report

Petrobangla Loses Niko Case

The state-owned Petrobangla has lost its appeal against Niko Resources in the International Centre for Settlement of Investment Disputes (ICSID) due to the failure of officials to present vital data before the court.

The ICSID upheld its previous verdict after a final hearing on May 26.

According to the verdict Petrobangla has to pay Tk 275.34 crore as compensation. It is assumed that the failure of the authorities to present appropriate data caused this loss.

A Petrobangla official said lack of enthusiasm of some officials resulted in losing the case. The responsible offi-

cials did not present actual information of the accident at the hearing.

The ICSID issued the decision on the payment claim initiated by Niko for gas delivered from November 2004 to April 2010.

So, Petrobangla has to pay a total amount of Tk 275.34 crore approximately, as compensation with interest of Tk 51.80 crore for up to September 11 of 2014 and with interest from September 12 in 2014, at six-month LIBOR plus 2 per cent rate for US dollar and 5 per cent for BDT, compounded annually.

EP

The Siemens logo is displayed in a teal, sans-serif font. It is positioned within a white rectangular box that is part of a larger white graphic element in the top left corner of the advertisement. The background of the entire advertisement is a low-angle photograph of industrial power infrastructure, including a large cooling tower on the left and high-voltage transmission towers and power lines stretching across the sky on the right.

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