How have the energy issues been played out?

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AS to the question how the national energy issues have been played out in 2014, one would probably find that uncertainties loom large in most of the energy sectors. In the face of depleting gas reserve on which the country almost wholly depended for last three decades, a comparative primary energy source is not in sight. One thing for sure though, that all agree to the fact that a multiple energy mix must replace the long adopted gas based mono-energy status in the country. But the uncertainties that veil the issues are overwhelming. There are probably more questions than one can answer on the issues.

How long the gas reserves can sustain the present gas based installations. A limited time frame for the above means a replacement source of gas is required. An alternative imported LNG (liquefied natural gas) source, conclusively initiated in 2014, means that we will replace $2 to $3 per unit own gas by $14 per unit imported LNG. But how long Bangladesh could sustain such costly venture and how will this affect the economy?

Coal is a logical alternative to gas under the above situation and the government is planning mega scale mostly import based coal fired power plants to that end. What would the huge amount of imported coal ($160/ton) mean in terms of cost of generated electricity. How does the government plan to exploit the cheaper coal ($100/ton) from local coal deposits? After the media hype for several years, is the issue of coal policy formulation evaporated in thin air in 2014?

Why are the oil based rental and quick rental power plants continue to generate costly electricity, although these were supposed to be phased out by 2014? As the year 2014 passed, people could very well remember the governmental promise that the power price would come down as the base load plants would take over from rental and quick rental plants. Yet we see the prospect of power and gas price hike coming to reality by the beginning of 2015?

All in all the energy status in Bangladesh is yet to stand on any degree of solid footing as to how best the country may solve the present crisis. In all the three principal energy fronts i.e the gas, the oil and the coal, the country could presumably see more problems than it could resolve.

Natural gas:

The question when would the present gas reserve in the country be exhausted holds little merit. The last drop of natural gas in the country would perhaps be withdrawn from the ground beyond 2030. A diminishing flow of gas down the pipeline for a long time would not contribute much in the economic drive. The important point is how long would the gas supply support a reasonable part of a consumption system. Taking this into consideration one may find it alarming that the government sponsored master plan (PSMP 2010) has projected that gas production would increase in the country until 2017-18 and henceforth the production will decline gradually and continuously until its eventual depletion. That means the gas supply curve will come closest to the demand curve in 2017-18 and henceforth the two will be separated from each other further and further with time. A large gap between the demand and supply thus produced will remain and will never be close again. The gas supply decline curve would have a long tail meaning that gas will continue to be produced in a small to insignificant volume for some length of time (Figure 1).

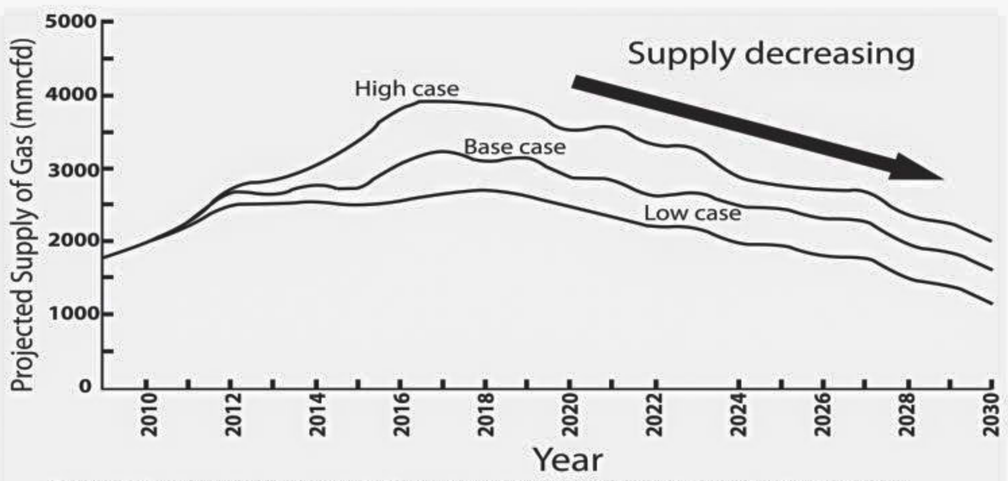

Figure 1. Projected gas supply in Bangladesh in near to medium term future-a rise and then fall (Source: JICA 2012)

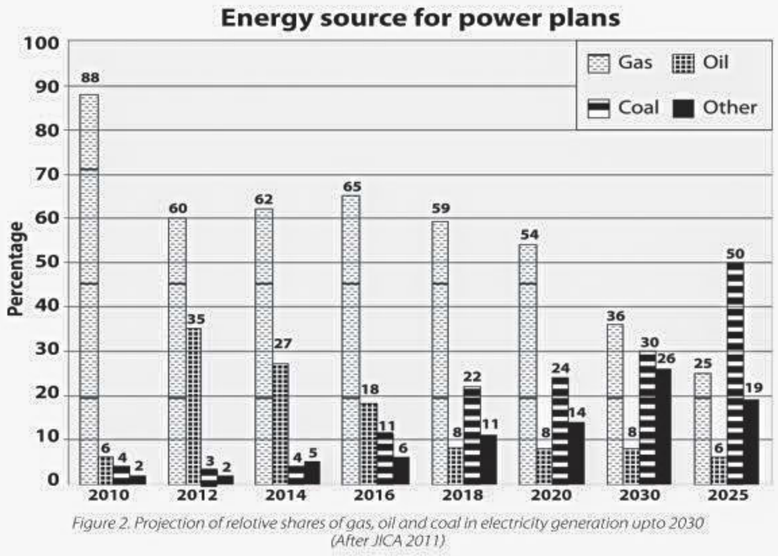

Figure 2. Projection of relative shares of gas, oil and coal in electricity generation upto 2030 (After JICA 2011)

> A diminishing flow of gas down the pipeline for a long time would not contribute much in the economic drive. The important point is how long would the gas supply support a reasonable part of a consumption system.

The above scenario may take a downhill turn should there be any deviation from normal behaviour of a major gas field. This is a case worth mentioning because of what happened in Sangu offshore gas field, now depleted and abandoned. Sangu at its peak production period supplied 150 mmcfd (million cubic feet per day) gas, but the gas production nose dived suddenly apparently because of the overproduction which damaged the reservoir. Presently Bibiyana gasfield in Habiganj district is the highest gas producer in Bangladesh and a major increase in the the gas production rate is being done in response to the government's demand of supplying 300 mmcfd more from what it was producing before. That means the Bibyana will be producing at a rate of about 1200 mmcfd gas from 2015 which equals almost half of the total daily gas production in Bangladesh. Consequently, the life span of the Bibiyana gas field is being cut short significantly. While a steady modest production rate would keep the gasfield vibrant for 25 to 30 years, the present program is likely to cause a nose dive in production around 2025 – only ten years from now.

To most geoscientist this is not a healthy practice in more than one count. Firstly, this will be a case of overproduction, a practice which is likely to damage the reservoir and may result in a sudden collapse of production like Sangu gas field. Secondly, we should not depend on a single gasfield for almost half of the total daily gas production in the whole country. Should Bibiyana is affected by any mechanical problem, or should there be any dispute between Bangladesh and the foreign company operating Bibiyana, a major crisis would crop up which would endanger the gas lifeline of the entire country. The year 2014 is when the infrastructures for the implementation of the targeted high production have been completed and the 2015 is the year when this program starts running in full swing. Many gas observers are skeptical about the merit of this over dependence for the gas supply on a single gas field.

Coal:

The most obvious change in the energy scenario in Bangladesh in the near future is going to be the gradual replacement of gas by coal as the principal energy source. At present about 3% of the total electricity generated in the country comes from coal fired power plant. The government, according to the PSMP 2010, projects that share of coal fired electricity will be increased to be 25% in 2020 and to 50% in 2030 (Figure 2). The total generation capacity of power is projected to be increased to about 20000 MW in 2020 and 40,000 MW in 2030. By thumb rule, for a 1000 MW power plant to run, about 3 million tonne of coal is required per year. By that count, the country would need 15 million tonne coal per year by 2020 and 60 million tonne of coal per year by 2030 for power generation.

At present there is only one coal fired power plant of 250 MW capacity fed by Barapukuria underground coal mine in Dinajpur. The government mega projects to build up several coal based power plant include 1320 MW at Rampal, 1200 MW at Matarbari, 1320 at Moheshkhali and 1320 MW in Pyra. In addition about 2500 MW more coal based power is on the planning stage by private sector. Assuming that the construction of the above coal power plants are implemented, we are still in the dark as to the source of coal to feed the plants. If all the coal is to be imported, as government plans, the issue of economics need to be addressed. Bangladesh has to pay dearly to import coal from far away places like Austrsalia and South Africa- the two most viable country coal may be imported from. In an estimate the country need to spend about 24,000 crore taka per year to import coal as above (equivalent to the cost of building one Padma bridge). In addition several billions of dollar has to be invested for preparing the infrastructure for coal handing. What would be price of the generated power with costly coal and would it be within reach of buying capacity of average citizen of the country?

Alternately, bringing in cheaper coal means mining the country's own coal reserves. There are good reserve of coal, but the controversy with coal mining in the country is rooted so deep that even in seven years after the first draft was prepared, the nation could not finalize a coal policy to identify the road map for coal exploitation. The debate is mostly on the issue of open pit mining which would supply enough coal but the strongly opposed by the local people. When this controversy flared up to an extreme level resulting mass agitation and death of protesters in 2006, the then opposition leader Sheikh Hasina pledged solidarity with people's demand of banning open pit mine in Bangladesh. Now being a prime minister she is least likely to break her pledge. The coal controversy has thus embraced element of politics within it and therefore it is more of a socio-political issue than a technical environmental one.

However, the local coal could still be made available by undergound mining but to a much reduced scale. An underground mine could probably produce 2 million tonne of coal a year and considering that there are four mines that can run, the total coal would be 8 million tonne a year, much less than the required amount in the long range. The solution to that is to go for both import and local coal so that the combined price could be little lower than if wholly imported. We may concludes that the hey day of cheap electricity by indigenous gas is over and we are being dragged into a future which is going to get us power at a higher cost in all terms.

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