

TOWARDS BUILDING A MODERN ECONOMY



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PRIMARY ENERGY AND POWER INFRASTRUCTURE

Where do we stand?



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In the last five years Bangladesh has been maintaining a GDP growth rate between six and seven percent. Consequently, Bangladesh's energy consumption has been increasing at more than eight percent per year. Electricity consumption has been increasing even faster at 10 percent per year.

The country is heavily dependent on natural gas. The consumption of natural gas in different sectors for the year 2015-16 is shown in Figure 1. As can be seen more than 40 percent of the gas is consumed by the power sector. Additionally, nearly 17 percent gas is used by industries to generate electricity on-site (captive generation), and there are many large industries such as the urea fertiliser plants that generate their own electricity using natural gas. Therefore, approximately 60 percent of total natural gas is used for power generation.

Domestic natural gas production is less than 3,000 MMcf (million cubic feet per day), but the demand is more than 3,500



The Matarbari Project includes a deep-sea port for handling coal and the real concern here is its cost and the resulting tariff.

PHOTO: STAR

MMcf. From existing reserves the supply cannot be increased, and, therefore, the gap between demand and supply will widen as the demand in 2030 is projected

to be more than 5,000 MMcf. Considering a modest exploration programme where the probable and possible reserves can be brought into supply, the production of gas would still fall to 2,000 MMcf in 2030.

If no new reserves are discovered then all proven reserves would have to be met through imported LNG. The 2P (proven + probable) estimate of remaining reserves is less than 14 Tcf (trillion cubic feet). Even if the 3P (2P + possible) remaining reserve, which is 18 Tcf, is considered, the 2030 demand cannot be met. The gas resources are modest according to a USGS study (32 Tcf at 50 percent probability), and cannot be relied upon beyond 2030 to fulfil demand in all sectors.

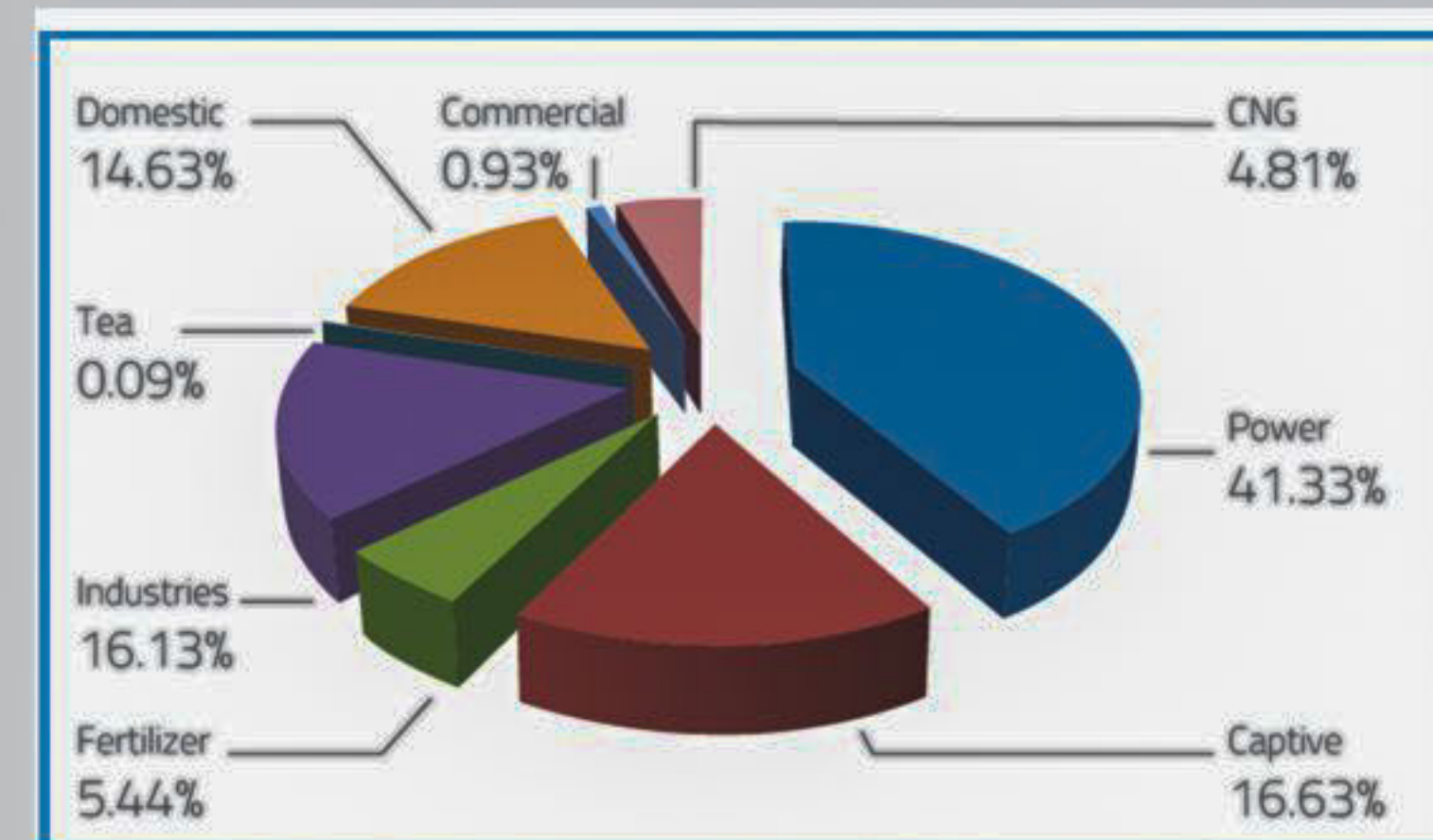
Bangladesh has plans to expand its electricity sector, but is finding it difficult to execute the plan because of severe shortage of primary energy. In the last decade Bangladesh has been able to add very little to the natural gas reserves. Since the country's industry and power generation is heavily dependent on natural gas, Bangladesh has decided to import LNG to meet the shortfall of gas. Obviously, this will have a huge impact on the price of gas. With more and more LNG import the price of electricity produced from natural gas would increase to a level that would no longer be the cheapest option in Bangladesh. When all of the gas is depleted then the tariff for gas-based electricity will be produced from LNG.

The present weighted average tariff for gas is USD 2.5/1000 ft³. Therefore, if LNG is used to meet the shortfall, then even in the best scenario industries will have to pay nearly three and a half times the present tariff, and in the worst case scenario, which is as probable as the best, the price of gas will be more than five times i.e. the full price of LNG.

With regard to developing coal resources, no progress has been made. Concerted resistance from environmentalists is preventing open-pit mining of coal. Bangladesh is blessed with one of the finest quality coal. Not only is it low in sulphur but a good portion of it is also high-value coking coal. If open-pit mining is employed then more than 90 percent of the reserves can be extracted. Even 50 percent of our known reserves will allow 10,000 MW to be generated over 20 years. Without open-pit mining it would not be cost effective to develop these mines. Only one coal mine has ever been developed in Bangladesh with Chinese assistance at Boropukuria, and has been able to extract only 8-10 percent of the reserves in its nearly 15-year mining history.

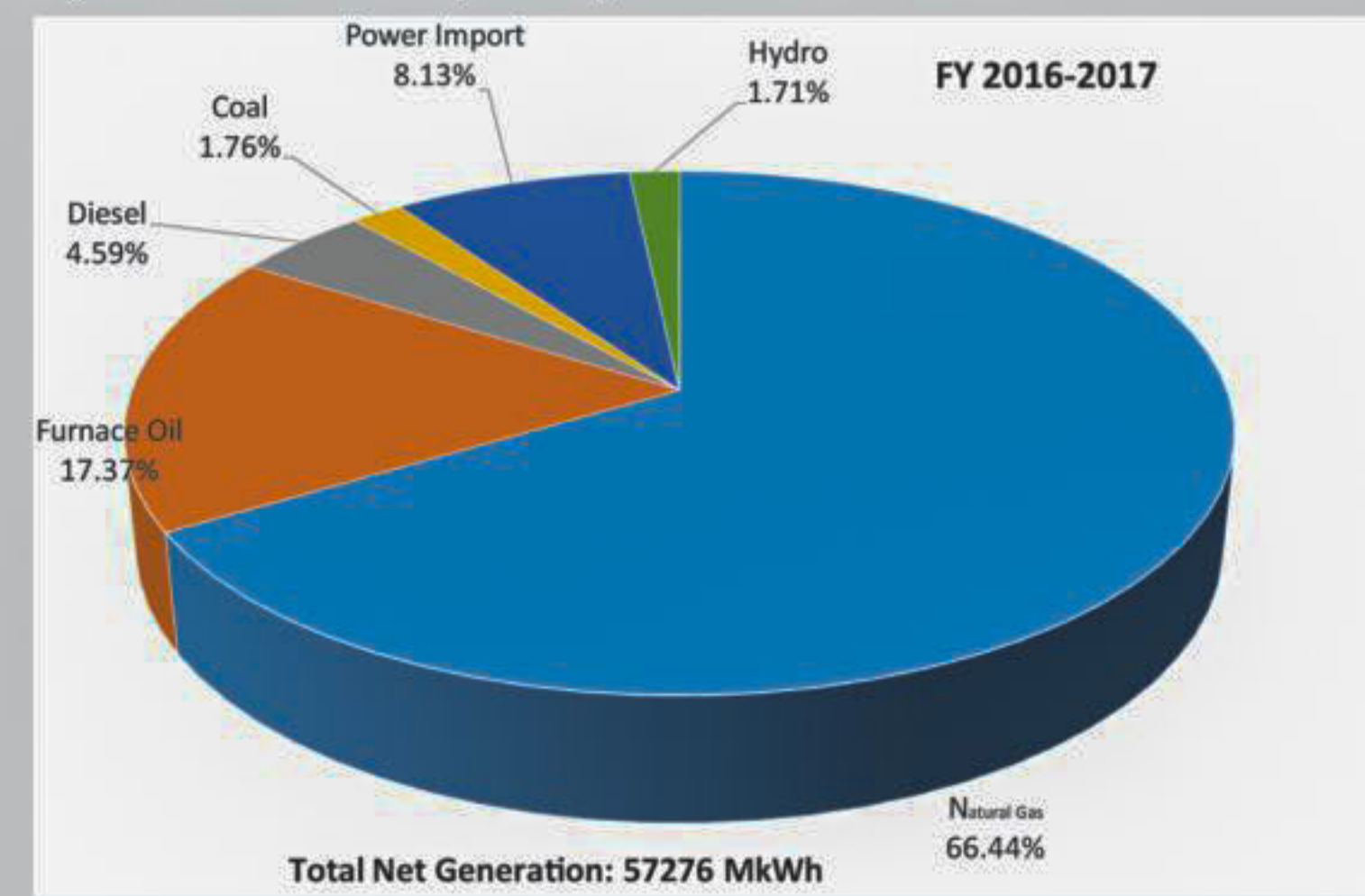
The government has declared that

Figure 1: Consumption of natural gas in different sectors (2015-16)



SOURCE: PETROBANGLA ANNUAL REPORT 2016

Figure 2: Fuel mix for power generation in 2016-17



mainly imported coal will be used for power generation. Depending on imported coal for 50 percent of electricity generation in 2030, as stipulated in the Power System Master Plan (PSMP) 2016, is ambitious and risky because Bangladesh does not have a deep-sea port. Three major hurdles with respect to imported-coal-based power plants can be anticipated, namely timely financing, construction of coal-receiving facilities, and coal purchase contracts.

POWER DEMAND AND SUPPLY

The fuel mix for electricity generation in 2017 is shown in Figure 2. Natural gas is the predominant fuel in Bangladesh, and as can be seen from Figure 2 nearly two-thirds of total electricity has been generated using this fuel. Other than the predominance of natural gas, there are two noteworthy things in the figure. The first thing to note is that nearly 22 percent electricity has been produced using liquid fuels (diesel and furnace oil). The second thing is that more than

eight percent electricity came from "power import".

The generation capacity in 2017 and the plans of the power sector for 2021 are shown in Figure 3 and Figure 4 respectively. Compared to the figure for 2017, it can be seen that imported coal occupies a significant portion of the pie in Figure 4. There is also doubling of power import capacity from four to eight percent. These expansions are expected to come at the expense of gas, furnace oil and diesel. Thus the challenge between now and 2021 is the successful completion of the coal projects and sealing the proposed power import deals.

COAL-BASED POWER PLANTS
Presently, three joint ventures are at various stages of implementation. The two private sector coal projects are yet to show any real progress. The total generating capacity of these five power plants is more than 6,500 MW. Of these, only the Payra Project is more or less on track, and is likely to start production in 2019. However, this project faces severe challenges with regard to coal

ARE YOU IN SAFE HANDS?

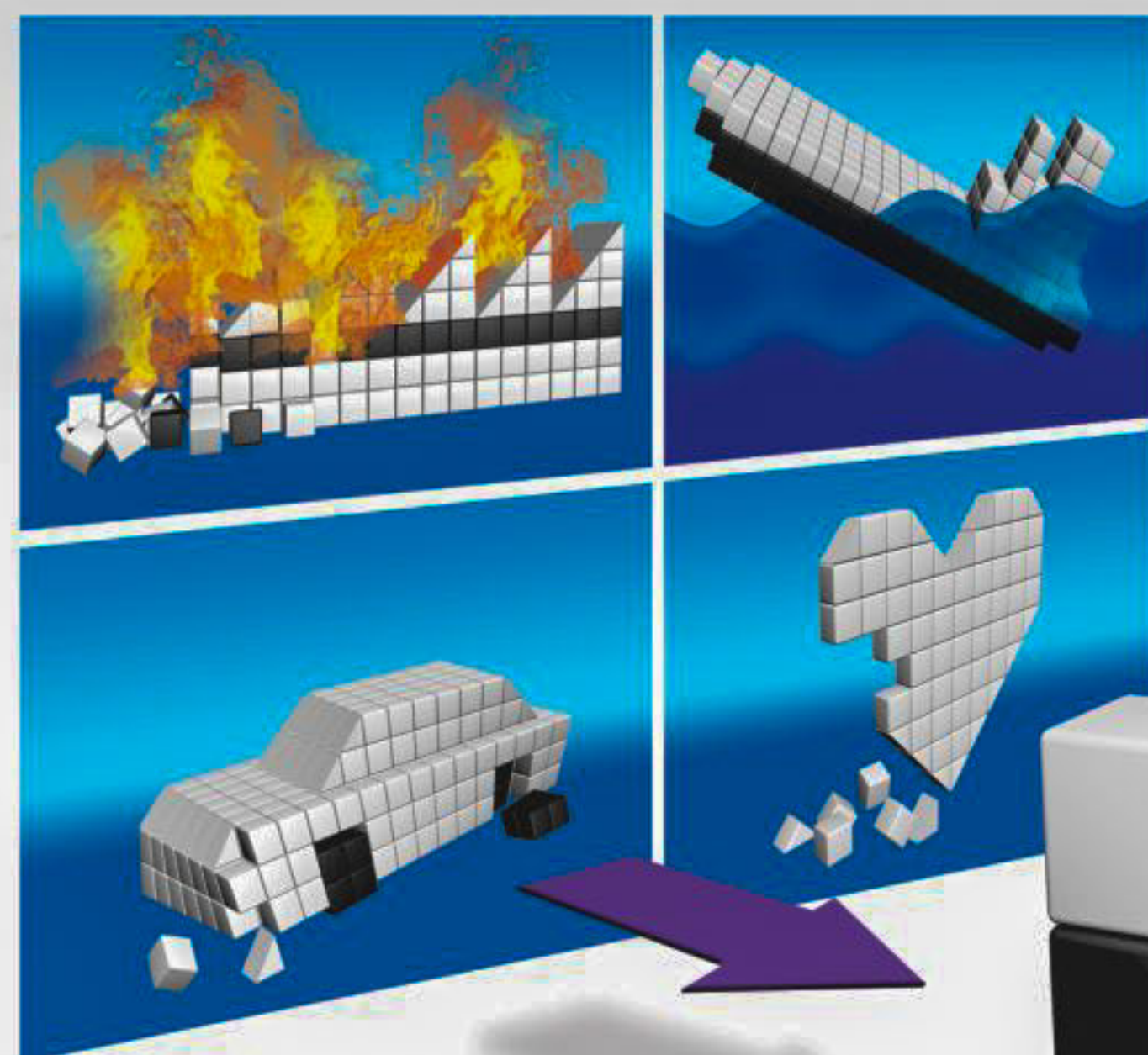
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