Challenges of Fuel Production & Availability Issues. Is India Poised to Tackle Them?

Satyajit Ganguly

India is the fourth largest consumer of energy with consumption of over 614 million tons of oil equivalent (Mtoe). Coal remains a staple to India's energy needs and even though the country produced 565.76 million tonnes of coal in 2013-14 (an increase of 1.7 per cent over FY 2012-13), it is still not enough to satiate the country's growing demand for energy, commensurate with the growing population and rising standards of living. The total import of coal has increased by 15.5 per cent (i.e from 145.80 million tonnes to 164.44 million tonnes) to meet the growing demand.

As far as domestic natural gas is concerned, its production has fallen in recent years. The total gas production faced a dip of approximately 13 per cent from FY 2012-13 to 2013-14 (i.e., from 39.78 billion cubic meters in FY 2012-13 to 34.64 billion cubic meters in FY 2013-14) with further drop-offs expected in the coming future. Given the growing demand and reliance on natural gas for power, issues with obtaining natural gas from other countries, and its own falling production, satisfying natural gas needs is one of the country's most critical challenges.

India currently imports over 35 per cent of its gas demand and this number is set to increase over the years. The import of gas is also influenced by geopolitical issues. Various plans with Myanmar, Iran, Pakistan, and Turkmenistan for the setting up of pipelines have fallen apart over security and border disputes.

Access to electricity is a tremendous problem in India and major inequalities in access plague the subcontinent. India faces an exploding demand and an insufficient supply. As the country's population and needs continue to grow rapidly, major reforms in infrastructure and efficiency is the need of the hour. Some of the key issues that India needs to address are as followed:

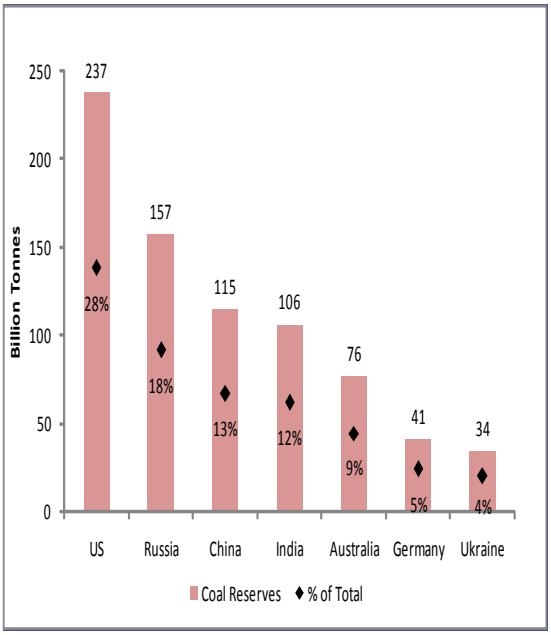
Production and availability issues -Coal:

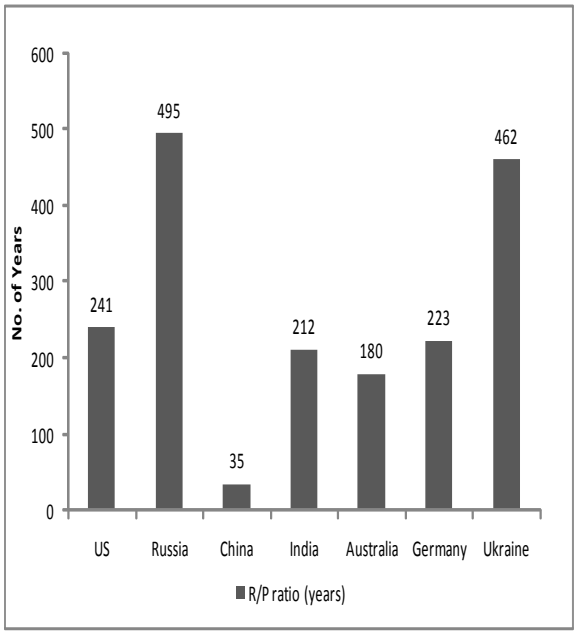
1. Coal Reserves

Coal provides 30.1 per cent of global primary energy needs and generates over 40 per cent of the world's electricity. India was the third largest producer of coal in 2012-13, meeting 71 per cent of its electricity requirement from coal.

Further, as a result of explorations carried out to the maximum depth of 1200 m, a cumulative total of 301.56 billion tonnes of geological resources of coal has so far been estimated in the country as on April 1, 2014.

India possesses significant coal reserves - fourth largest in the world. In terms of the reserves to production (R/P) ratio, India has enough reserves to meet the demand for coal for the next 232 years approximately.





2. Stagnating Domestic Production:

During the 11th Five-Year Plan, India's coal demand increased at a compound annual growth rate (CAGR) of 8.5 per cent. However, CIL's domestic production has increased at a CAGR of 4.6 per cent during this period. As pointed out by the Ministry of Coal and CIL, the rigid and time-consuming procedure to obtain environmental and land permission from the Ministry of Environment and Forests and state governments resulted in considerable delays in coal mining projects.

3. Import Dependence:

The direct outcome of sluggish domestic coal production is the considerable increase in the import of coal. India's coal imports have more than doubled over the last five years, which is noteworthy in a country where the public perception is that coal is abundant. Growing coal import dependence creates several major complications. First is that coal imports are not easy due to limited supporting infrastructure. Second, different characteristics of coal typically allow Indian power plants to blend imported coal with domestic coal only up to 10% to 15%.

4. Infrastructure:

India requires a well-integrated infrastructure for its coal supply chain, which includes railroads, importing ports and washeries. Delayed construction of railways by Indian Railways, to connect mines, dispatch centres and end-use destinations, has already created a considerable bottleneck in coal supply in recent years. The supporting infrastructure – India's domestic manufacturing capacity of mining equipment and machinery – is a cause for concern as well. Limited supply capacity and poor quality of equipments of Indian suppliers can hinder mining productivity.

According to one of the Central Electricity Authority (CEA) reports, 28 coal-fired power plants are in a critical state with coal stock that is expected to last for less than seven days. Out of these, 14 have coal stock that may not even last four days. It speaks volumes about the coordination, or lack of it, between the various departments of the Government. While power plants are being starved of fuel, it is reported that huge quantities of coal produced from the mines of Coal India Ltd. (CIL) remain piled up at pit heads for want of railway rakes for transportation to different power plant locations.

5. Investment:

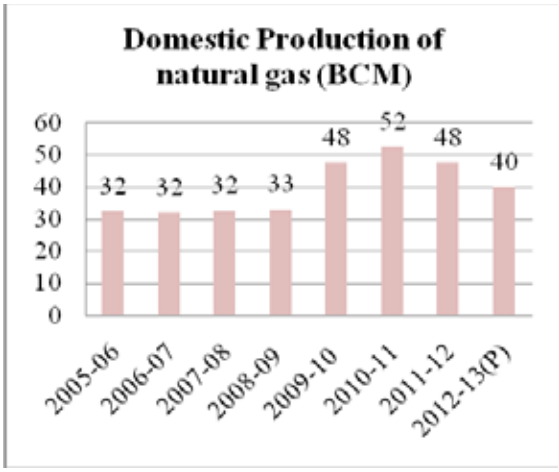
The coal sector is the only energy sector remaining de facto closed to private investment. Two PSUs, CIL and SCCL, practically have a monopoly on coal production. The only segment open to private participation is captive production. FDI is allowed only in captive-mining related business: 100 per cent FDI is allowed in captive mining for power projects and coal-processing plants selling washed coal to raw coal producers; FDI up to 74% is allowed for other captive consumption. But private producers are barred from selling processed coal in the open market. The most problematic aspect in the coal sector is this lack of private investment. Once CIL and SCCL fail to achieve production targets, there is no reliable alternative source to make up the losses other than imports.

Production & Availability Issues - Gas:

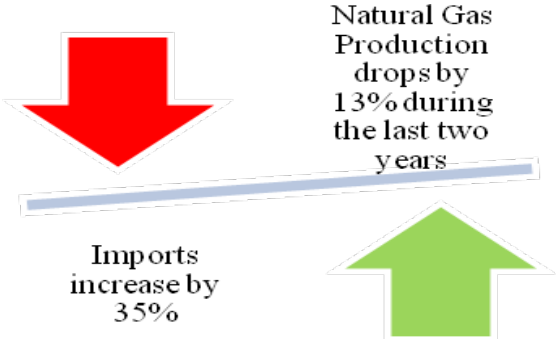
1. Declining Domestic Production:

The total world production of natural gas increased from 2674.2 Mtoe in 2007-08 to 3041.6 Mtoe in 2013-14. The production has increased by 0.8 per cent from 2012-13 to 2013-14. Country-wise, USA was the largest producer of natural gas (20.62 per cent) in the world during 2013-14, followed by the Russian Federation (17.90 per cent) and Iran (4.93 per cent). However, India's share in the total world production of natural gas during 2013-14 was only 1 per cent (30.3 Mtoe).

Further, production of natural gas in India has decreased from 39.78 billion cubic meters (BCM) in 2012-13 to 34.64 BCM in 2013-14 registering a negative growth of 12.92 per cent and a CAGR of 1.12 per cent from 2005-06 to 2013-14.



The uncertain future of Indian domestic gas production has cascading effects on the overall role of gas in the country's energy sector. The impacts have already been felt in the power sector where the PLF of gas-fired plants during the year averaged only 18.64 per cent in May 2015 due to unavailability of gas, India is, therefore, contemplating the import of more LNG, but this again raises the question of affordability.



2. Affordability:

The two largest gas consumers, power and fertilizer, are highly price-sensitive as they operate in tightly-regulated output markets. Fuel is not a fully pass-through cost in the power sector in competitive bidding under section 63 of the Electricity Act. Thus, it is unlikely that that the two industries can substitute domestically produced gas with LNG in the near future in light of the substantially higher costs. However, other potential customers – industry, captive power production, refining and petrochemicals – are presumed to be able to pay even higher prices for electricity, although no alternative cost benchmark has yet been established. One possible benchmark could be alternative fuel prices based on calorific value, as unmet gas demand is currently substituted with liquid fuels.

3. Infrastructure:

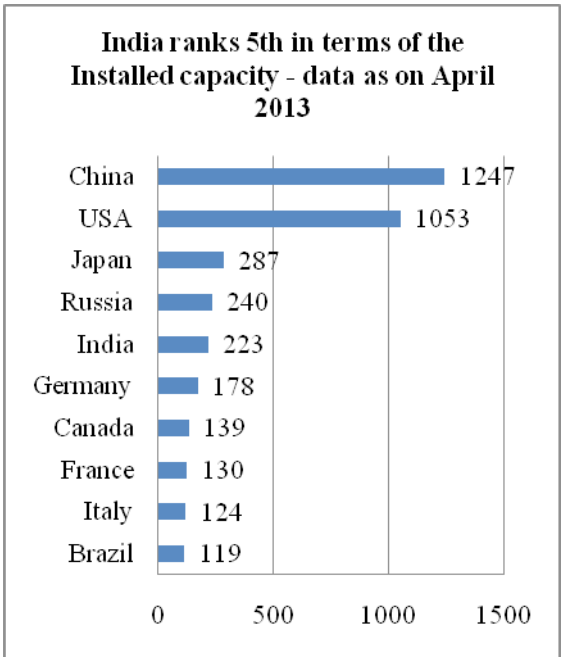
India is still far away from having a fully integrated national gas grid. Especially, the Southern and Eastern parts of the country suffer from a lack of connectivity. A fully developed grid would allow gas-fired power generation, especially high efficient CHP (combined heat and power) units, and industrial use to spread throughout the country and provide anchor load for other users like citygas and CNG. Particular attention should be paid to last-mile connectivity as many potential and solvent gas consumers are unable to access the gas due to lack of regional infrastructure. However, the absence of clear and effective third-party access conditions both to distribution and transmission grid needs to be resolved urgently to encourage much needed investment.

4. Gas Utilisation Policy:

The central government's Gas Utilisation Policy, in practice, negates the right of the NELP producers to sell gas on purely commercial basis. Instead gas is allocated by the government. Priority is given to fertilizer, LPG and power sectors. One of the side-effects of the Gas Utilisation Policy is that the latent gas demand in India is difficult to discover as industrial consumers and IPPs rank at the bottom of the priority list. Furthermore, the policy limits further upstream investments as the high cost of off-shore exploration cannot be recovered from the priority sectors that are highly price-sensitive.

Per Capita Power Consumption

IPP generation in India has significant growth potential and India ranks fifth globally in terms of the installed capacity.



Unfortunately, the per capita consumption of electricity in India is 914 kWh, which is far below the world average of 3010.4 kWh.

All India Per capita Consumption of electricity#	
2012-13	914.41
2013-14	957*

*Provisional

#(gross generation + net import)/mid-year population

It is evident that per capita consumption in India is expected to grow with increasing population, economic growth and rising income levels, which in turn speaks well for IPP capacity in the future.

Conclusion and way forward

In view of the above and considering that adequate availability of fuel (coal/natural gas) at reasonable prices is the pre-requisite to spur capacity addition in the power sector, here are some areas requiring immediate attention and intervention are:

Coal

1. Expediting the establishment of an independent coal regulatory authority and the constitution of appellate tribunal for coal.
2. Ensuring successful completion of competitive bidding for allocation of captive coal blocks.
3. Setting-up a standing inter-ministerial committee of the Ministry of Power and Energy to act as a single window for environmental and forest clearances of power projects and associated mines. This will expedite the process of obtaining clearances, ensure better coordination between the involved ministries and strike a balance between energy security and environmental security.
4. CIL to take aggressive lead to acquire overseas coal mine assets or enter into long-term contracts to import coal. The imported coal to be blended with domestic coal and sold to power generation consumers at average prices against the long-term contracts.
5. CIL to take steps to develop underground and abandoned mines to augment domestic coal production capacity.
6. Rationalization of coal source linkages to generation plants to optimize coal transit time and costs of transportation.
7. Transportation infrastructure of roads/railways and ports are required to be strengthened/expanded as the coming years will witness increasingly higher volumes of both domestic and imported coal.
8. Reviewing of bidding guidelines for power projects, especially where imported coal is involved, for determination and allocation of fuel taking into account controllable and uncontrollable factors and possible measures to mitigate risks. Possibility of pass–through of genuine increases in fuel costs to procurer deserves serious consideration.

Gas

9. Focussing on accelerating developments of discovered gas and marginal fields as well as renewed focus on exploration of unexplored basins.
10. Expediting development of LNG terminals and pipelines by resolving land acquisition issues.
11. Sourcing of natural gas at competitive prices
12. Maximising mature field production and recovery through production optimisation by deploying efficient and effective technology.
13. Blending of domestically available natural gas with RLNG and its supply by Gas Authority of India and to power plants at average cost.

About the author

Satyajit Ganguly is the Managing Director at ONGC Tripura Power Company. In the past, he has worked with Central Electricity Authority (CEA), Power Grid Corporation of India and Power Exchange India Limited as well as leading private sector companies. `

The views expressed are of author and do not necessarily represent the views of IPPAI.