RIS Policy Brief

No. 101 December 2020

Price Discovery becomes Robust in Gas, Electricity and Coal Markets in India in Post-Covid 19 Reforms

India's energy policies, often seen as disparate efforts have begun to coalesce. They have also begun to get ambitious. On 30 September 2020 the ministry of coal has opened the bids for the auction of 38 coal mines[1]. These mines are to be auctioned with their coal reserves allowed to be sold to any entity on a commercial basis instead of being used only as feedstock for their own use, by the bidders. It changes a 47 year old policy of coal nationalisation.

The economy had been a late starter to get its energy policies integrated. It updated its National Energy Policy in 2017[2] after a gap of more than two decades. It recognises the need for an integrated vision of energy security. The recent policy developments in various sectors including coal, petroleum and natural gas, power and renewable energy demonstrate the overriding nature of this vision. In the process energy security now spans a dual objective—one of those is at sub-national level with detailed plans including 100 per cent electrification of Indian railway routes by 2023, provision of subsidised LPG cooking gas to all families under the poverty line to supporting hydrogen enriched CNG as an alternate fuel and acceleration of clean coal technologies. The other objective is at the global level with enhancement ofengagement with key global energy players that implies strategic and comprehensive energy engagements with supplier countries such Russia, US, Saudi Arabia and UAE on hand and also with key fuel consumer economies, such as Japan and South Korea.

A very significant element of this objective of energy security is the development of a market mechanism for price discovery in gas, coal and electricity. In the span of few months India has brought trade in gas and electricity under the spot market mechanism. It also wants to eventually set up a national spot market for coal.

This has to be put in the context of investments in the sector by China.[3] The approach of China includes a specifically energy-related vision: the Global Energy Interconnection Initiative (GEII), a sub-component of the Belt and Road Initiative. This aims to create the first global electricity grid, using a technology that China has fully mastered, UHV (Hyper High Voltage) power transmission networks, and investing in the electricity grids of more than 80 countries.

Allowing pricing freedom is a big deal in the Indian energy policy. Gas is (largely) under an administered pricing system, electricity prices in no state reflects demand and supply

RIS *Policy Briefs* are prepared on specific policy issues for the policymakers.

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forces, moreover, lack of transparency in coal pricing was one of the reasons foreign investors have baulked in investing in Coal India (CIL). Even though more than one state chief minister has made objections to some of these reforms, the rapid pace of movement in these sectors is an indication of how seriously the government plans to secure India's energy security by making efficient price discovery the bed-rock of it.

So the changes in India, both those launched and on the anvil, are, therefore, most significant. India has already made petrol and diesel prices market based with effect from 2017. India's state owned oil marketing companies IOC, HPCL and BPCL switched to daily price setting instead of fortnightly revisions that was followed till then. The International Energy Agency had pointed out that most times Indian consumers still pay more for petrol than global crude prices warrant.

This could seem surprising as retail prices of both petrol and diesel kept on rising through June 2020, despite record drop in global oil prices. Some of the difference also happened because India does not buy at spot prices but at what is known as the average of a basket of prices that usually includes Oman, Dubai and Brent crude prices polled at the time of purchase. To that is added the tax levied by both the centre and the states. The tax comprises roughly 70 per cent of the total retail price.[4]

However, all these movements demonstrate that despite aberrations pricing of energy fuels in India is now highly market linked, as of July 2020.

The establishment of trading exchanges for gas and coal and their expansion for electricity markets is therefore a harbinger of even more such changes for the consumers. At the very least there would be options for the consumers of not having to buy the fuel when the suppliers want them to do so. It will be a demand driven market for each of the fuels, something that manufacturing industry will love and domestic consumers of cooking gas to those planning electric vehicles could certainly be pleased with. In the weightage of Consumer Price Index fuels group carries the sixth heaviest weight (rural and urban) indicating how important it is to the consumer's expenditure basket. This will only rise as the consumption of electricity rises through net usage as India becomes digital. Larger degree of mobility will also raise the share of fuel group. As government moves away from subsidised availability of fuel for most income groups, it is therefore of utmost importance that there should be rationalisation of the price of fuels.

Also as the prices for all these commodities for long administered by the ministries become market determined, the benefits should accrue to the renewable electricity sector too, which has increasingly replicated the ills of coal based power. India plans to move 40 per cent of its power to renewable by 2030.

Pricing freedom:

1. Natural gas

A domestic market mechanism for pricing the energy commodities and their derivatives makes sense even though India has a shortage of gas and oil. It imports over 80 per cent of those and even of coal despite holding the world's fourth largest reserve.

According to Enerdata statistics India's total energy consumption is a third of USA and even less at 30 per cent of China for the year 2018. The change in the relative pricing of the key fuels could help quite a bit to bridge the gap.

One needs to understand why one has to compare how gas is currently supplied within India and what a market can do instead. Suppose there is a cement plant in Rajasthan (there are quite a few of them). This plant runs on gas as a fuel and has a varying demand for its product. But it cannot tailor its demand for gas since it has to buy it at an administratively set price with a set quality standard. A spot market, is however, like a bazaar where our cement maker can on a given day of the week

[1] Coal mine auction: Receipt of offline/physical bids; PIB, GOI 29 September https://pib.gov.in/PressReleasePage.aspx?PRID=1660044

[2] National Energy Policy, Niti Aayog, 2017; https://niti.gov.in/writereaddata/files/new_initiatives/NEP-ID_27.06.2017.pdf

[3] Foreign Investments in the European Electricity Sector 2 Jul 2020: Enerdata; https://www.enerdata.net/publications/executive-briefing/international-electricity-investments-europe.html?utm_source=Enerdata&utm_campaign=05f9773cad-Email_Daily_Energy_News_07_2020&utm_medium=email&utm_term=0_838b1c9d18-05f9773cad -124491877

[4] Here's why a crude oil crash won't reflect fast on your petrol and diesel bills NAVDEEP YADAVAPR 21, 2020; Business Insider; https://www.businessinsider.in/india/news/heres-why-a-crude-oil-crash-wont-reflect-very-fast-on-your-petrol-and-diesel-bills/articleshow/75264311.cms#:~:text=This%20is%20because%20of%20the,of%20crude%20oil%20per%20se.

buy gas at an advantageous price and offset it against a lean market for cement. On other days when the market for cement is buoyant it will be willing to buy at a higher price too, or settle for a compromise of a lower rated gas like unprocessed gas if it wants to. At another time it may opt for a variety with a higher heating value. A spot market for gas can offer to sell all varieties of the product offering advantage to the buyers even when the country is dependent on imports, in other words ensuring what industry calls a stronger price discovery.

The Indian Gas Exchange (IGX) which began operations[5] in June 2020 will hope to reach there as a nationwide online delivery based gas trading platform. Incorporated as a wholly owned subsidiary of the IEX - India's energy market platform, IGX will enable market participants to trade in standardised gas contracts. The platform is fully automated with web-based interface to provide seamless trading experience to the customers. The petroleum minister has noted: "The government has no business to be in business and the consumer is the king in a free market…through IGX, India's vision on mega investments on Liquefied Natural Gas (LNG) terminals, gas pipelines, city gas distribution infrastructure and permission for market driven price mechanism will be materialized".

It is understood that the Petroleum and Natural Gas Regulatory Board (PNGRB) is working on rationalization of tariff to make natural gas affordable in every part of the country. As of now the exchange will allow participants to trade in standardized gas contracts, diversifying into new products later.

It will take a few years, though, to happen. A Morgan Stanley report estimates the domestic gas market could be as high as $15 billion by 2025. The same report notes that India has become the second fastest growing gas market[6] in the world (China is first) with LNG demand set to reach 31 million tonnes by 2025.

"There can be industry wise value discovery with a gas exchange, something which wasn't possible without a gas market. Of course it will not be positive for everyone but that is what a market mechanism is for", said Shuvendu Bose, senior energy expert at IFC. The domestic gas currently sold under the administered price mechanism cannot be sold in the exchange. The market is available only for fresh capacity coming up under the New Exploration Licensing Policy.

The other challenge is infrastructure for gas pipelines. Unlike the power sector where there is a national grid, India has less than 12,000 kms of existing gas pipeline. Another 14,239 kms of network of about 12 pipelines was approved last year. It would also need hiving of state run GAIL into two companies with one responsible solely as a pipeline operator.

2. Coal

The same concerns for price discovery should propel the coal market too, where government run Coal India and Singareni Collieries Company Limited suffocatingly dominate the supply chain. This is peculiar because India is the lowest cost producer of coal among the key producers of the world. India's coal demand is expected to reach close to 1500 million tonnes by 2025 but this could have been larger.[7] A large percentage of manufacturing companies that used to depend on coal have shifted out meanwhile. Some did due to environment concerns but more have done it because of the uncertain state of supply of coal that has encouraged them to switch.

Even giant downstream companies like NTPC have wrestled with quality and price issues of the coal they purchase for their power plants. There have been some improvements though. Since 2018 coal prices are set by the two state run suppliers based on the gross calorific value[8] (heat content) of each coal consignment it sends out. It is a more realistic price and certainly an improvement over an averaging mechanism used earlier. Coal was earlier sorted into grades and for each grade their average heat content was used as yardstick. But CIL complains that the new mechanism makes the prices adverse for it because it has to account for every dip in the

5 Ministry of Petroleum & Natural Gas--15 JUN 2020; https://pib.gov.in/PressReleasePage.aspx?PRID=1631721

6 ETEnergyWorld July 23, 2019; https://energy.economictimes.indiatimes.com/news/oil-and-gas/india-becomes-second-fastest-growing-gas-market-30-billion-war-chest-ready-for-supply-boom/70342243

7 ETEnergyWorld August 20, 2018; https://energy.economictimes.indiatimes.com/news/coal/indias-thermal-coal-consumption-to-reach-1076-mt-by-2022-23-crisil/65475033

8 Precise Pricing CIL's new pricing mechanism to limit grade slippages in coal bills March 2018: Powerline; https://powerline.net.in/2018/03/09/precise-pricing/#:~:text=Coal%20India%20Limited%20(CIL)%20is,consignment%20from%20April%201%2C%202018.&text=In%20January%202018%2C%20coal%20prices,by%20almost%2022%20per%20cent.

quality but cannot take the same advantage for an improvement. All of these concerns can be sorted in an open market which can judge the quality far better than a company set mechanism even if one assumes that it has been set transparently.

The union ministry of coal is, however, hopeful of the way things are unfolding. In various fora[9] they have emphasised about the need for a mechanism for price discovery in the markets. One of those is a coal exchange. Unlike gas, more of CIL's production is expected to come under the exchange, which will also subsume the e-auction mechanism of the company. The first stage of the process to develop an exchange will be the auction of coal mines for commercial mining. The coal ministry has in June 2020 announced auctions for coal mines on commercial basis.[10] Once the production from the auctioned coal mines[11] come into the market, the basic requirement of volumes to kick start a spot exchange will happen.

These auctions will change the rules from earlier regime where auctions were allowed only for restricted sectors, use and price. Now there are no such restrictions at all. "The proposed auctions have terms and conditions which are very liberal allowing new companies to participate in the bidding process, reduced upfront amount, adjustment of upfront amount against royalty, liberal efficiency parameters to encourage flexibility to operationalize the coal mines, transparent bidding process, 100% FDI through automatic route allowed and reasonable financial terms and revenue sharing model based on National Coal Index. The successful bidders also will have flexibility in coal production unlike past and have provision for incentives for early production and coal gasification". These efforts are expected to supplement the 1 billion tonne coal production expected from Coal India in FY 23-24 and meet the full requirement of domestic thermal coal.

The changes are co-terminus with some other changes in the mining[12] sector done over the past couple of years. These include amendments to provide for joint allocation of coal blocks as composite "Prospecting License-cum-Mining Lease". To make mining plans for entrepreneurs simple many overlapping information sought earlier has been deleted. Also the power to approve the mining plan has been delegated to just within the Coal Controller Organisation, to bring transparency. But there are concerns, One of those is about the possession of land by the miners around the mines. Land being a state subject, the central government will have limited scope to intervene. Also, the miners still need to obtain the environment clearance from the union ministry of environment, though here the coal ministry could expedite those.

The World Coal Association[13] has acknowledged the significance of India's coal auctions. Its statement says : "We strongly support all countries in their right to choose coal and clean coal technologies, to deliver their economic and environmental aspirations. Today is an important milestone in India's drive towards '24x7 affordable and environmentally friendly power for all by 2022', with coal enabling economic growth, bringing power to households, and directly supporting the steel and cement industries who will be critical to the success of the 'Make in India' campaign. Moreover, the coal auctions will support several other policy objectives of the Indian Government, including Prime Minister Modi's 1 billion tonne coal vision and economic recovery following COVID-19".

The efforts to ramp up coal production is also important looking at what is happening globally too. The Indonesian[14] Coal Mining Association (APBI) has decided to cut domestic production to 480 MT in 2020 in a bid to increase global coal prices (as on August 25 Newcastle Coal Futures was US$ 59.08, 17.1 per cent down from January 1, this year) from 582 Mt in 2019. Indonesian coal exports to China, India and the Philippines have been hit by the coronavirus outbreak and ongoing restrictions. Bumi, which is Indonesia's largest coal producer, has reduced its 2020 output

9 Government Looking At Reducing Entry Barriers In Coal Mining, Business Standard; January 24, 2020 https://www.business-standard.com/article/news-cm/government-looking-at-reducing-entry-barriers-in-coal-mining-120012400638_1.html

10 Ministry of Coal-11 JUN 2020 https://pib.gov.in/PressReleasePage.aspx?PRID=1630919

11 India delays coal mine auction process, 11 August 2020; Argus Media https://www.argusmedia.com/en / news/2131231-india-delays-coal-mine-auction-process

12 Ministry of Coal--03 JUN 2020 https://pib.gov.in/PressReleasePage.aspx?PRID=1629073

13 Statement from Michelle Manook World Coal Association Chief Executive; https://www.worldcoal.org/wca-response-india-coal-auctions

14 Indonesian coal producers to reduce output in a bid to bolster prices 6 Jul 2020; Enerdata; https://www.enerdata.net/publications/daily-energy-news/indonesian-coal-producers-reduce-output-bid-bolster-prices.html?utm_source=Enerdata&utm_campaign=ead4e38499-Email_Daily_Energy_News_07_2020&utm_medium=email&utm_term=0_838b1c9d18-ead4e38499-124491877

guidance from 94.5 MT to 85-90 MT.

But on a longer term Indonesia will build a massive 2 GW coal fired ultra super critical project in Java. The tender has been won by South Korean[15] utility Korea Electric Power Corporation at a cost of US $3.5 billon. In Cambodia[16] a 700 MW coal fired power plant in the Preah Sihanouk province with an investment of US $1.3 billion project will be developed by the state run Cambodia International Investment Development Group and Chinese company Huadian Sihanoukville Power Generation, an affiliate of the Chinese state-owned power generation group China Huadian Corporation. The project has two phases of 350 MW each. The first phase will be commissioned in 2023 and the second a year later, in 2024.

At the same time, in Europe, Germany[17] has approved a 40 billlion compensation package for coal fired power utilities to shut down by 2038 at the latest. Under the agreement, these utilities will benefit from compensations for switching their plants to gas, depending on the power plant's age and the conversion date, or for shutting them down by 2033 altogether if they cannot do so.

3. Electricity

Rationalisation of coal prices would basically help the power sector, big time. Of all the exchanges in fuel, the power business has enjoyed the longest spell in the spot market. But it is also the sector grappling with the highest legacy issues. The launch of real time pricing of power in the power exchange in addition to the day ahead trading is therefore a big deal.[18]

Because of these legacy issues, whenever a company buys electricity it has to pay for both the share of fixed costs demanded by the power producers in addition to the variable costs of production. Some of the higher fixed costs flow from the high price of coal. To compensate for such uncertainty of price and supply, the generation companies prefer to enter into long term power purchase agreements with the electricity distribution companies. These agreements account for more than 90 per cent of the market. The latter too are happy with the buffer for they are not sure about the ability of the different generators to meet their commitments. In Maharashtra, for instance, the installed capacity is 38GW but the average load drawn by the state has never exceeded 17GW. It is the same story for other states too. The cost of this additional capacity has to be apportioned among the stake holders. It also makes renewable capacity costlier as the discoms have to make allowance for this legacy of fixed costs when bidding for new capacity.

The spectre of losing the arrangement and being forced to work realistic prices for power has annoyed some of the states. We have referred to the objections of some states on the centre's plans to amend the Electricity Act. Their objection is that electricity is a concurrent subject for legislation and so the centre should not have moved into its regulations at least without detailed consultations with them. The expansion of the role of the power exchanges does not come under those amendments but by asking the states to stick to the narrow in the act, it certainly gives more room for play to the exchanges.

At a pan India level costs of this nature have ballooned to more than Rs 90,000 crore. Another evidence of this is that India is sitting on 370 GW of capacity with a peak load of only 180GW. It is an infrastructure build up which has added to costs in the sector and is a deadweight for the economy.

If instead the prices can be sorted through spot exchanges, it will bring sanity to the eventual price of electricity. It will also force the distribution companies, mostly state run and so reluctant to cut losses by charging efficient prices to pull themselves up. If electricity flows through exchanges, there shall be no option for the states to offer free power sops and will be perforce forced to reform their pricing. The generation companies, most of all, will have no option but to finance their own fixed costs and either become efficient or shut their plants. Actually unlike what the West Bengal chief minister feels the exchanges

[15] KEPCO goes ahead with a 2 GW coal-fired power project in Indonesia 2 Jul 2020; Enerdata; https://www.enerdata.net/publications/daily-energy-news/kepco-goes-ahead-2-gw-coal-fired-power-project-indonesia.html?utm_source=Enerdata&utm_campaign=abab8bfdaa-Email_Asia_Weekly_Energy_News_07_2020&utm_medium=email&utm_term=0_838b1c9d18-abab8bfdaa-124491877

[16] Cambodia approves a 700 MW Chinese-built coal-fired power project 3 Jul 2020;Enerdata; https://www.enerdata.net/publications/daily-energy-news/cambodia-approves-700-mw-chinese-built-coal-fired-power-project.html?utm_source=Enerdata&utm_campaign=3e4ccea270-Email_Daily_Energy_News_07_2020&utm_medium=email&utm_term=0_838b1c9d18-3e4ccea270-124491877

[17] Germany approves a €40bn plan to phase out hard coal by 2033 1 Jul 2020: Enerdata; https://www.enerdata.net/publications/daily-energy-news/germany-approves-eu40bn-plan-phase-out-hard-coal-2033.html?utm_source=Enerdata&utm_campaign=d6ad3a8fdd-Email_Daily_Energy_News_07_2020&utm_medium=email&utm_term=0_838b1c9d18-d6ad3a8fdd-124491877

[18] PTI June 01, 2020: ET; https://energy.economictimes.indiatimes.com/news/power/power-exchange-india-starts-real-time-market-for-electricity-transactions/76133125

can raise the efficiency of current investments in power generation and distribution and so reduce the drag on state finances. This can be a win-win situation for both the consumer and the states.

There is another reason why electricity should be traded more on the exchanges. The South Asian grid through BIMSTEC that India is nurturing can be a reality only if nations draw their requirements through the exchange. At present India and the other nations have entered into several power purchase agreements (PPA) to buy and sell electricity. This leads to sub optimal pricing since each PPA has its own trading terms. This militates against free price discovery. A robust electricity market can encourage the nations to instead use it to meet their need at better terms.[19]

The two electricity exchange had for some time been offering day ahead market, i.e. a market where anybody who needs power can book a slice of supply at a 24 hour notice. This month, the exchanges have extended the market to what is known as real time market. In this market consumers, including discoms and captive users or anybody else can buy power on exchanges just an hour before delivery. The next phase is the development of an ancillary market for power. The day ahead market has begun to get traction. Prices at real time market should be higher than day ahead. Overdraw from the grids by the discoms to meet sudden surges should also smoothen out in future.

Way Forward

India has clearly become ambitious in its energy policies. From a narrow focus that treated energy security, mainly at managing supply and demand the scope of the policy has expanded. At the sub national level the definition plans for 100% electrification of Indian railway routes by 2023, provision of subsidised LPG cooking gas to eight crore families, installation of over 15 lakh standalone solar pumps under *Kisan Urja evam Utthan Mahabhiyan* by MNRE, that of Road Transport Ministry supporting hydrogen enriched CNG as an alternate fuel, accelerating clean coal technologies by developing coal gasification projects and Green Port initiative by Ministry of Shipping and so on. Each has its demand and supply dynamics that in turn depend on integrating them with the overall national goals. Beyond the borders this implies taking into account geo-political, economic, social and environmental dimensions. It has consequently had to be made a part of energy diplomacy in alignment with India's foreign policy choices. This has yielded results.

To make all these possible it is necessary that decisive changes are made in the domestic pricing policies to make the market for coal, gas and electricity robust. This has taken the shape of pricing freedom by setting up trading exchanges which shall allow market forces to determine demand and supply for these commodities.

The establishment of trading exchanges for gas and coal and their expansion for electricity markets is, therefore, a harbinger of key changes that augurs well for the Indian consumers. Smart pricing ushered through spot exchanges creates hopes for economies of scale for end users, from agricultural to industrial. It will usher in efficiencies in the production process to offer a massive support to the goal of AtmaNirbhar Bharat.

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[19] Panel Discussion with Energy Studies Institute, NUS: 03 July 2020: https://www.facebook.com/instituteofsouthasianstudies/videos/1525385570967167/

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