

NATURAL GAS

2022 –

A Tumultuous Year

By Deepika Lal



The year 2022 was the year of uncertainty for the global natural gas sector. Russia's invasion of Ukraine in the beginning of the year led to a disruption of Russian gas supplies to Europe and triggering a kind of global energy crisis causing spiralling energy prices. The disturbances have since been felt across the world. European nations which were hitherto relying on piped gas had to scout for alternative arrangements while the Western world too faced shortage of supplies amidst increasing gas exports to Europe.

However, despite the crisis, the Indian gas sector was more or less successfully able to tide over 2022. We have made an endeavour to bring to you the turns and twists in the Indian gas story which despite the global turbulence showed resistance to all the negative factors impacting the economy and stayed on the growth path.

Russia's invasion of Ukraine – The Global Gas Impact

Russia has been by far the world's largest exporter of fossil fuels including natural gas;

it supplied 40 per cent of Europe's natural gas, mostly via pipelines. However, after its invasion of Ukraine in the beginning of 2022, pipeline imports from Russia were dramatically reduced in response to Western sanctions. Flows through the Nordstream 1 pipeline, which used to take gas from Russia to Germany ceased. Soon afterwards, the pipeline itself was badly damaged in a series of explosions. Deliveries from Russia to Poland through the Yamal pipeline also ceased. And therefore, Europe became increasingly reliant on LNG imported by sea.

Consequently, European LNG imports in January-September 2022 were 23% higher than in the whole of 2021. This increasing reliance on LNG meant that European buyers paid whatever the market asked to attract cargoes (which could otherwise find buyers elsewhere; particularly in Asia). This led to a dramatic increase in gas prices in international markets from early to mid 2022. The gas prices reached unreasonably high levels by August. European households and businesses were faced with huge increases in their energy payments.

When natural gas prices in Europe skyrocketed,



FEATURE STORY

European buyers sought alternatives, ultimately importing enormous volumes of LNG from the US in order to meet mandated reserves ahead of the winter. However, unseasonably warm temperatures thereafter led to a reduction in heating demand, which in turn kept European storage sites full. Resultantly, LNG tankers in European waters doubled since September. The LNG prices which were hitherto ruling high fell drastically because of so much availability of LNG. However, these LNG vessels lining up offshore held their positions in anticipation that colder weather will increase demand for energy and in turn drive up prices. And they were right. December arrived with colder than normal weather conditions and the prices shot up again. EU Dutch TTF prices, Europe's benchmark for natural gas, skyrocketed from roughly €70/MWh prior to the start of the war to an all-time high of €350/MWh in August before falling to €130/MWh in early December.

Gas in India - The Year of Survival

India is the world's third-largest energy consumer. India's economic growth is closely linked to its energy demand, where oil and gas play a key role.

Within energy, natural gas remains the fuel of choice and a promising energy source because of its low emission of particulate matter, carbon dioxide, nitrous oxide and cleaner burning. However, its per capita consumption of natural gas stands at only around 29 standard cubic metre (SCM) vis-a-vis the world average of 363 SCM. The gas share on primary energy mix also is a mere 6.7% against the world average of 24.7%. For US it is 34.82%, Russia 52.31% and China 8.18%. Considering that and its benefits, the government has time and

again shown its commitment to increasing gas share in India's primary energy mix to 15% by 2030 and it has been supporting that with various policy directives and regulatory changes to reach that goal.

Gas Consumption

While gas consumption had returned to higher than normal levels in 2021-22 supported by opening of the economy after COVID, it took a hit following the Russia's invasion in 2022. Consequently, during the first six months of 2022-23 from April to September, the daily consumption was only 172 MMSCMD, lower than the average daily consumption at 180.5 MMSCMD during the same period of 2021-22. The primary reason was the lower spot purchases of costly LNG in the international market given the high prices driven by Russia-Ukraine conflict. Considering the LNG imports constitute almost 50% of India's gas consumption, India too faced the consequences.

Sector-wise, the fertiliser sector almost maintained its share in gas consumption at around 33% in 2022 (30% in 2021-22). However, the price sensitive power sector's share declined drastically to 14 % (17%) since it was not able to afford the high gas prices. CGD sector, however jumped

Gas Statistics -Production/Consumption/Imports

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Apr-Sep 21	Apr-Sep 22
Net production	84.52	86.93	87.83	82.90	76.12	90.77	90	91.65
LNG Imports	68.08	75.18	78.74	92.84	90.03	84.32	90.55	80.36
Total consumption (incl internal consumption)	152.59	162.11	166.57	175.74	166.15	175.09	180.55	172.01

Sector-wise Gas Consumption 2021-22 (MMSCMD)

	Fertiliser	Power	CGD	Refineries	Petro	Others	Total
RLNG	33.87	7.32	14.35	10.75	6.93	8.96	82.18
Domestic	15.66	20.51	19.01	3.81	0.92	26.39	86.29
Total	49.53	27.83	33.36	14.56	7.85	35.35	168.47
Sector's share in total consumption (%)	29.4	16.5	19.8	8.6	4.6	20.9	100

Sector-wise Gas Consumption (Apr-Sep 22)

	Fertiliser	Power	CGD	Refineries	Petro	Others	Total
RLNG	39.36	3.95	12.36	7.14	3.5	7.84	74.15
Domestic	14.99	18.64	20.85	4.55	1.74	26.88	87.65
Total	54.35	22.58	33.21	11.69	5.25	34.72	161.8
Sector's share in total consumption (%)	33.59	13.96	20.52	7.22	3.24	21.46	100

Gas - Sector Growth During Last 5 years

	2015-16	2021-2022
Gas Consumption	130 mmcmd	168 mmcmd
LNG regasification capacity	21 MMTPA	42.7 MMTPA
CGD gas consumption	17 mmcmd	33.4 mmcmd
GAs covered	64	297 GAs
No. of CNG stations	~1026	4709
No. of PNG connections	~3 million	9.9 million
Pipeline network	16,000 km	20629 km



its share to over 20% with increased demand due to overly priced alternative fuels diesel, gasoline and other alternative fuels in other sectors and the increasing coverage of gas distribution networks. Nevertheless, the overall situation led to a significant stress on the profitability of CGD companies.

What is driving the growth in CGD sector is the expansion of city gas network and price economics of CNG and PNG vis-à-vis competing fuels. This is visible in the numbers. The first CNG station was built in 1992. And now, there are over 4700 CNG stations. The target is 10,000 by 2030. Only 6% population had access to PNG till 2014 and now it is going to be nearly 98% covered by 297 geographical areas (GAs). Resultantly, piped gas is reaching 9.9 million domestic, industrial and commercial consumers as of now. The target is to take this to 60 million by 2030. As the gas grid widens and the connectivity increases further, CGD share could be the primary driver of gas growth in India.

Gas Supply

Consumption in the first six months of 2022-23 was supported by higher gas production at home and lower imports. The domestic production did well with highest output in past few years. While in 2021-22, there was a record gas production of about 91 mmscmd, a huge jump from 2020-21 (76 mmscmd), the same level of output was also maintained for the period April-Sep 2022.

This growth was primarily supported by increasing levels of production at the difficult fields of Reliance Industries and BP’s ultra-deep-water KG-D6 Block in the Krishna Godavari basin and ONGC’s UIB deep-water gas located in the

KG-DWN 98/2 block on the east coast. These are now contributing 20% of domestic production. Though the ceiling price for gas to be produced from these difficult fields was raised to \$9.92/MMBtu for Apr-Sep 2022 and now stands at \$12.46 for the period of Oct 22-Mar 23, it still remained much lower than imported LNG rates.

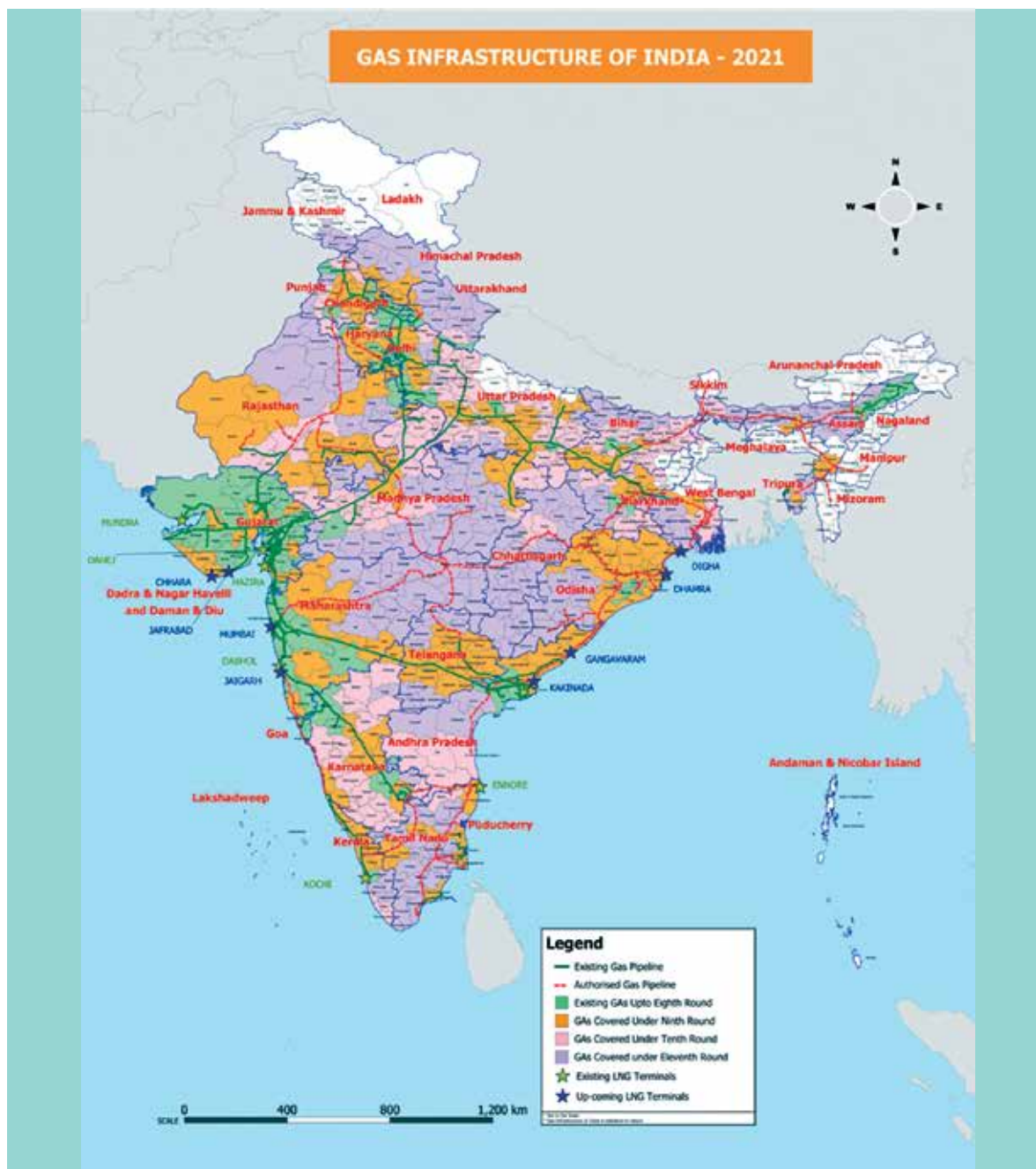
On the other hand, LNG imports saw a decline during 2021-22 to 84 mmscmd and further to only 80 mmscmd during Apr-Sep 2022 because of high prices abroad. In terms of source of importing its gas, India relies on Qatar for 40% of its LNG with the rest coming from the UAE, Oman, US, Russia, Nigeria, Angola, Nigeria and Australia.

Infrastructure Development

Infrastructure development has been a major focus area for the government with gas pipeline grid being established across the country and are at various stages of completion.

In pipelines, about 35,000 km natural gas pipeline network across the country has been authorised with the aim to create a national gas grid. Almost 21,000 km of natural gas pipelines are already operational (as of June 30, 2022) and another 14,000 km are under progress. With the completion of the PM Urja Ganga project in the eastern region, several fertiliser plants and refineries will provide a further boost to the gas demand. Completion of key trunk pipelines like Jagdishpur-Haldia, Kochi-Bangalore, Mehsana-Bhatinda, and the North East grid would facilitate better gas penetration.

Once this network is established, India would be able to provide gas for vehicles and household, commercial or industrial use to 88% of India’s geographical area under 297 GAs bid till now.



Since India sources almost 50% of its gas consumption through LNG imports, it is also increasingly investing in building its LNG regasification capacity at different locations which can easily serve the demand centres or feed the gas grid. India currently has six LNG regasification terminals at Kochi, Dabhol, Dahej, Hazira, Mundra and Ennore with a cumulative capacity of 42.7 MMTPA.

It is expected that these will increase from 6 to 10 by 2024 with capacity expanding to 62 MMTPA. Four new terminals are expected at Dhamra in Odisha, Jaigarh in Maharashtra and Chhara and Jafrabad in Gujarat. Existing terminals are also

being expanded. Petronet, for example, will likely add 5 mmtpa capacity at its Dahej terminal. Plans to build a floating terminal at Gopalpur in Odisha are also on.

Gas Prices

The increase in gas prices globally since the beginning of 2022 was reflected in a big jump in the domestic natural gas prices. Domestic gas prices were first raised to \$6.1/MMBTU during Apr 2022-Sep 2022 and then to \$8.57/MMBTU during Oct 2022- Mar 2023. The prices for difficult fields were also increasingly accordingly.

The gas price increase was reflected in the hike



in both CNG and PNG rates across entities from time to time during the year. PNG prices in Delhi rose 52 per cent in just over a year to Rs 53.59 per standard cubic metres (SCM) in October 2022 from Rs 35.11 per standard cubic metres (SCM) in September 2021. CNG prices shot up 57.9 per cent during this period to Rs 78.61 per kg from Rs 49.76.

Gas pricing in India has always posed a problem — and has been revised every six months based on a formulaic mish-mash derived from the weighted average prices of four global benchmarks: the US-based Henry Hub, Canada-based Alberta gas, the UK-based NBP and Russian gas. But neither producers are happy with it nor the consumers. While producers have been seeking complete pricing freedom for marketing their gas, gas consumers have asked for a price band to keep domestic natural gas affordable.

Accordingly, the government set up a committee under the energy expert Sh. Kirit Parikh in September 2022 to review the current gas pricing formula. The committee held consultations with various stakeholders, including gas producers, industry associations, generators, city gas distributors, and fertiliser makers, and submitted its report in November end.

The committee has suggested benchmarking price of natural gas produced from ONGC and OIL's legacy or old fields at 10 per cent of cost of crude oil imported into India. This rate would however be subject to a ceiling or cap price of \$6.5 per mmbtu, until a full deregulation of

prices is implemented in 2027. There would also be a floor of \$4 with a view to cover for cost of production and at the same time keeping cost for fertiliser, power and CNG, which use gas as input raw material, at manageable levels.

The basket of crude oil India imports averaged about \$83 per barrel in December. Going by recommendation of the committee, the price for APM gas, which makes up

for 60 per cent of all gas produced in the country, should be \$8.3 per mmBtu (10 per cent of imported oil price). But ONGC and OIL (OIL) will be paid only \$6.5 in case the recommendation for ceiling and cap price of the committee is accepted by the Cabinet. And therefore, to protect the domestic producers, the committee has also favoured paying them a premium of 20 per cent over such price for any new gas production they add from old fields. For gas produced from difficult fields, the panel has recommended continuing with existing formula without any floor.

Overall, the increased prices for domestic gas were still more affordable than LNG prices ruling in the international market and so the consumers relied more on domestic gas during 2022. It is expected that the domestic gas prices for the next control period could increase further given the speculated spike in the global prices. What is important here is that there should be a stability of domestic gas prices for enabling a consistent gas consumption, thereby ensuring the sectoral growth.

For sourcing our LNG, it is becoming increasingly critical to mitigating the risk of high LNG spot price by maintaining a portfolio mix of long-term, medium-term and spot cargoes. Out of India's total LNG capacity, about 50-60% capacity is booked on a long-term basis, which leaves close to 40% of capacity for spot RLNG. In comparison, countries such as Japan and South Korea have 80% of LNG contracted in long term which protects them in case of high spot prices. More importantly,

EXPERT OPINION

Key Challenges in the Gas Sector & Possible Solutions



AKHIL MEHROTRA, MD & CEO,
Pipeline Infrastructure Limited

- Lack of pipeline connectivity across eastern/southern parts: Fully functional National Gas Grid will help.
- High cost of imported LNG and insufficient availability of domestic gas
- Limited LNG regasification capacity: Completion of new LNG terminals on east coast will be beneficial.
- Shortage of skilled manpower
- Overbooked contractors and suppliers
- Lack of an appropriate pipeline tariff regime
- Absence of a uniform taxation regime: Gas

should be brought under GST

- Delay in approvals for pipeline laying: 'Single Window Clearance' will fasten the process.
- Falling renewable electricity price, adoption of EVs and increasing focus on hydrogen: Need to find newer user markets for gas such as room heating and cooling, use in telecom service towers, long-distance transport, inland waterways, LNG bunkering in fishing/marine vessels etc. More mobile refuelling units (MRUs) need to be in place.
- Minimal presence of international investors in the sector
- Lower than expected participation in upstream licensing



M. K TIWARI,
Managing Director, BGL

- Non availability of land for CNG stations: Need to encourage use of the Mobile refuelling unit and doorstep CNG delivery
- High gas prices: Immediate implementation of Kirit Parekh committee recommendations is necessary
- Trade margins on CNG sales: Need to rationalise

trade margins

- Incentivisation of CNG kit manufacturing and retrofitment is important
- Need to recognise and declare CGD as public utility
- Variable VAT and duties on gas: Gas should be brought under GST
- Incentivisation needed for CNG kits manufacturing and retrofitment business
- APM pricing at source point: Uniform city gas station pricing is required



SANJAY SHARMA,
Director (Commercial), MNGL

- Low availability of domestic natural gas and high prices of RLNG
- Inadequate gas pipeline infrastructure: Faster

execution of national gas grid will help

- Increased cost of setting up CGD networks resulting in delays in achieving MWP targets within timeline/extended timeline
- Massive increase in demand for CGD equipments and infrastructure vs supply constraints



R.K DAS,
Managing Director, CUGL

- Continuous increase in gas price: Opting for IGX for buying /selling of gas instead of a single buyer/seller may be a solution
- Gas supply restrictions on both domestic gas and RLNG: Contracting with multiple buyers / sellers at competitive prices may be a solution
- High VAT tax for CNG and PNG: Gas should be brought under GST
- Need for robust, mandatory guidelines by state governments to discourage use of polluting fuels

like coal, furnace oil etc. by industries: Issuance of mandatory guidelines are necessary

- Lack of time-bound procedure for issuance of permissions/NOCs from state government authorities: Setting time-bound procedures are important
- Non availability of land for CNG stations at concessional rate in GA limits
- Third party damages of pipeline
- No separate utility corridor for laying of gas pipelines
- Last mover disadvantage as most of the underground space has been already occupied by other utilities

we believe it would be prudent to hedge long-term contracts with pricing linked to Henry Hub, Brent and JKM markers.

The discovery of market-driven prices for natural gas with India’s first gas exchange Indian Gas Exchange (IGX) which was set up in June 2020 has been fruitful. Many companies have started trading gas on IGX; infact ONGC became the first company in India to trade domestically produced gas on IGX in May 2022 after the government allowed domestic producers of gas to sell 10% of their annual production on exchanges in August 2021. Selling gas on IGX allows domestic producers to earn market price for their gas as against the lower administered price fixed every six months. This also incentivises them to bring more acreage under production. With more and more sellers and buyers trading on the exchange, it will help in developing India in becoming a more mature and competitive gas market.

Regulatory and Policy Push

Apart from the pricing intervention, the Government continued to focus on fulfilling the increasing demand for gas as well as to increase the share of gas in the energy basket in 2022.

On the supply side, the government is focusing on finding new reserves and tapping existing fields. The Director General of Hydrocarbons (DGH), since the launch of Hydrocarbon Exploration and Licensing Policy in 2016, has offered about two lakh square kms in seven rounds of bidding for 134 blocks. The eighth round bidding process for

36,316 square kms is over and winners are yet to be announced. A few months ago, DGH announced it will offer 26 blocks over nine sedimentary basins covering an area of 2.23 lakh square kms for exploration and development through international competitive bidding. About 36 blocks in these regions are estimated to have an oil and gas resources potential of 1,775 metric million tonnes of oil equivalent.

To create more demand centres across India, the government is connecting more and more areas with gas under city gas distribution. The Petroleum and Natural Gas Regulatory Board successfully conducted 11th and 11A rounds of CGD bidding taking the total number of authorised GAs to 297, covering 98% of country’s population and 88% of its area.

Future outlook

All in all, India’s outlook for the natural gas sector looks very exciting on the back of rising domestic production, development of missing infrastructure links including pipeline connectivity and additional LNG terminals and supportive regulatory and environmental policies. Robust growth is expected in the Indian oil and gas sector, thereby making the sector quite attractive and conducive for investment. That is evident from the government and companies’ planned investments in the sector. Last year, Prime Minister Mr. Narendra Modi announced that the Government plans to invest ~Rs. 7.5 trillion on oil and gas infrastructure in the next five years. This investment will be used



to expand gas infrastructure — pipelines, port-based LNG terminals, CGD networks and gas exploration projects by February 2026.

On supply side, increase in domestic output is expected to continue in the short to medium term as ONGC and Reliance/BP have committed significant investments. Offshore prospects on the east coast should continue to bear fruit with additional supplies from KG Basin. ONGC is planning to invest ₹31,000 crore in exploration over the next three years and has roped in ExxonMobil as E&P partner. The company has cumulatively invested ₹1.5 lakh crore in E&P over past five years.

Reliance Industries is also increasing gas production. With the commissioning of MJ Field, KG-D6 will increase its contribution to India's gas production. RIL and BP are developing three deep-water gas developments in KG D6 — R Cluster, Satellite Cluster and MJ — expected to produce 30 mmscmd gas by 2023. Oil India Ltd (OIL), which produced 8.2 mmscmd of natural gas in FY22, the highest since its inception 63 years ago, is also increasingly pursuing E&P. It drilled seven exploratory and 31 development wells last year alone and is planning oil and gas exploration in Assam and other areas — Assam Shelf & Assam Arakan Fold belt, Rajasthan basin, Mahanadi onshore, Andaman onshore and Kerala-Konkan onshore.

Huge investments are planned in creating infrastructure too (as we discussed above). Various companies such as Adani Total Gas, IOCL, BPCL, HPCL, GAIL, Torrent Gas, Think Gas, AG&PS, etc. have committed further investments. These companies plan to spend thousands of crores in the city gas areas which they won in the 11th and 11A rounds of CGD in the next eight years. Petronet LNG too announced that it would invest ₹40,000 crores in the next five years for expanding LNG import infrastructure.

Consequently, gas demand is expected to be driven by the increasing investment in the sector and the increasing CGD spread. Sector-wise, CGD and small industries are expected to be the key drivers of demand. New industrial clusters/belts, like, Petroleum, Chemicals & Petrochemical Investment Regions (PCPIRs),



National Investment and Manufacturing Zones (NIMZ), Mega Food Parks etc. currently being developed are expected to drive gas demand from the industrial and commercial sectors in the future. Above all, stable gas prices will accelerate the growth of consumption of gas. Also, the increasing awareness about CNG and its cleanliness and price economics vis-a-vis petrol and diesel will establish CNG as a main transport fuel in the coming years.

Globally, Russia-Ukraine conflict has given the world the need to rethink their energy order. Importing countries are now reassessing the role of natural gas as a transition fuel and are looking at securing their energy supplies by exploring more trustworthy alternates. The environmental case for clean energy needed no reinforcement, but the economic arguments in favour of cost-competitive and affordable clean technologies are now stronger — and so too is the energy security case. Infact, many countries may switch from natural gas to renewables. The result may actually be good in the long term leading to changes that have the potential to fasten transition to a more sustainable, cleaner and secure energy system.



The author of this article is Deepika Lal. She has been the lead content writer for GSR since 2015. An economics graduate and an MBA (Finance), she has over 22 years of experience in research and analysis and content writing in the energy sector. She has produced several industry reports and research papers and has profiled many leading names in the oil and gas domain in her professional career.