

# Fuelling the world's third largest energy consumer

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**T**he Indian oil and gas sector is more than a century old, tracing its origins back to the first oil strike in Assam in the northeast in 1889. So the country's oil and gas story runs parallel to the growth of the global oil industry.

Whether it is India's post-independence industrial and agrarian revolutions, the automobile boom, the growth of the aviation industry, the mainstreaming of LPG in urban kitchens, all have been fuelled by this vital sector of the economy.

India is today poised to be a driver of global economic growth. This will see a steep increase in its energy consumption. The combined share of oil and gas in India's energy basket, at 29 per cent in 2013, is expected to rise to 32 per cent by the year 2040. As the third largest consumer of energy in the world, India is an attractive market for international oil and gas exporters as well as oil and gas companies keen to partner with Indian companies.

India is already a top destination for FDI. It has an excellent banking system, many reputed institutes of management and engineering, a productive and skilled workforce, enjoys a demographic advantage, and has a large mass of aspirational customers who are driving demand.

The oil and gas sector, under the Ministry of Petroleum and Natural Gas, is geared to meet the challenge of making energy accessible and affordable across the socio-economic divides.

## Tapping the upstream potential

With India dependent on imports for more than 80 per cent of its oil consumption, exploration and production is a critical area that requires a robust strategy for long-term energy security.

India's 26 sedimentary basins cover an area of 3.14 million km<sup>2</sup>, of which 1.35 million km<sup>2</sup> area is in deepwater, 0.4 million km<sup>2</sup> in shallow water and the remaining 1.39 million km<sup>2</sup> area is on land. While the true prospectivity of Indian reserves is yet to be established, 61 per cent of the forecast reserves of 28 billion tonnes (oil and oil equivalent of gas) are also to be harnessed.

The Government of India envisages a complete re-engineering of the sector. The new strategy focuses on enhancing domestic oil and gas production and bringing substantial technology and investments from abroad. Other unconventional hydrocarbon resources that are being pursued by India are coal-bed methane (2,599 billion cubic metres) and shale gas/oil reserves and gas hydrates (estimated in significant recoverable quantities). Besides efforts to raise domestic production, India's national oil and gas entities have also acquired 24 oil and gas blocks abroad.

Strategic crude oil storage is another area of government focus, with the creation of the Indian Strategic Petroleum Reserves Ltd and the construction of storage at three locations of 5.3 million metric tonnes.

The new Hydrocarbon Exploration and Licencing Policy (HELP), promoting ease of doing business and investing from abroad, plus an ambitious target of a 10 per cent cut in crude oil imports by 2022 offer an excellent opportunity to intensify exploration efforts within the country.

The increasing popularity of natural gas – in industry, homes and transport (as compressed natural gas in cars) – is built on a natural gas pipeline network of over 16,200 km. It is expected that, in about five years, this network of trunk gas pipelines will increase to about 30,000 km.

## India emerges as a refining hub

With a total refining capacity of 230.1 million metric tonnes per annum (mmtpa) against a cumulative consumption of 177 mmtpa in 2015-16, India is the second largest refiner in Asia and is a net exporter of finished and value-added products. Its 23 refineries have been performing to international standards, and the fall in crude oil prices has contributed significantly to the profitability of the refining sector.

With India's oil demand projected to grow from the current 177 mmtpa to 490 mmtpa by the year 2040, a similar increase in domestic refining capacity will be needed, including expansion of existing capacity and new greenfield refineries, with a mega-refinery on the west coast. In this sector, a number of collaboration and investment opportunities lie in refinery configuration, upgrading auto fuels to Euro-VI norms, refinery-petrochemical integration, catalyst and technology development, carbon footprint reduction, hydrocarbon loss control, energy efficiency management, advanced process control, real-time optimisation and advanced shutdown management systems.

India is now a major exporter of refined petroleum products. In 2015-16, it exported 43.8 million tonnes of petroleum products, including lubricants and petrochemicals.

In the wake of rapid urbanisation and the automobile sector boom, the country's fuel station network, currently numbering over 53,000, is bound to witness a huge expansion. They are also being modernised and automated on a massive scale. Value-added services and non-fuel businesses at fuel stations are also emerging as attractive propositions in line with international trends.



**IndianOil spans the hydrocarbon value chain, from production and refining through to distribution and marketing**

### LPG as a cooking fuel

India is one of the world's largest markets for Liquefied Petroleum Gas (LPG) as cooking gas in kitchens. With a goal of raising the penetration of LPG from the current 61 per cent of the population to over 85 per cent, LPG use is being aggressively promoted in rural India. Over 100 million new domestic gas connections are to be realised in the next three years, half of them with subsidy for poor families. The LPG retail network is also being expanded, opening up investment opportunities in new LPG bottling plants and bulk LPG transportation.

The management of subsidies for LPG as cooking gas has been innovatively rationalised through a countrywide Direct Benefit Transfer (DBT) scheme, whereby the cash subsidy is directly transferred to the bank accounts of the beneficiaries, making it possibly the world's largest cash transfer programme for households. Demand for another petroleum product – aviation fuel – is also benefitting from government expansion of civil aviation, with the addition of 34 new airports to bring the total to 125 around the country.

### The road ahead

Looking to the future, Indian oil and gas companies are pursuing research in areas like shockwave-assisted fracking, tribology and refining technologies. Indian Oil's R&D centre has developed several world-class refining processes such as INDMAX (for LPG/propylene maximisation), OCTAMAX (for higher production of high-octane gasoline with improved RON)

and INDAdaptG (for production of BS-IV gasoline from INDMAX gasoline stream).

Fuelling India's rapid economic growth calls for a concerted and sustained strategy to increase energy efficiency and manage growth in energy demand, along with tackling the multiple facets of energy policy, including pricing, promoting bio-fuels, accelerating transition to Euro-VI grade auto fuels, and putting in place a robust plan to ensure secure energy supplies and equitable distribution at stable, affordable prices. Against the backdrop of India becoming a hotspot of hydrocarbon expansion, Indian Oil is organising the 12th edition of the PETROTECH International Oil and Gas Conference and Exhibition in New Delhi in December 2016.

Investing in people is important for the future. India's oil and gas sector has an excellent pool of talented technical professionals, and their expertise will be most beneficial in all international partnerships. In view of the massive growth in the sector, the government has set up a Hydrocarbon Skill Sector Council (HSSC) which has a roadmap to train nearly two million people over the next 10 years in 134 different roles pertaining to the upstream, midstream and downstream, as well as the construction and services sectors.

Overall, the Indian oil and gas industry is robust, responsible and responsive, and is capable of taking on the emerging opportunities and challenges. Today, as a resurgent India rises, the oil and gas sector stands committed to creating a brighter tomorrow for the country's 1.25 billion people. ●