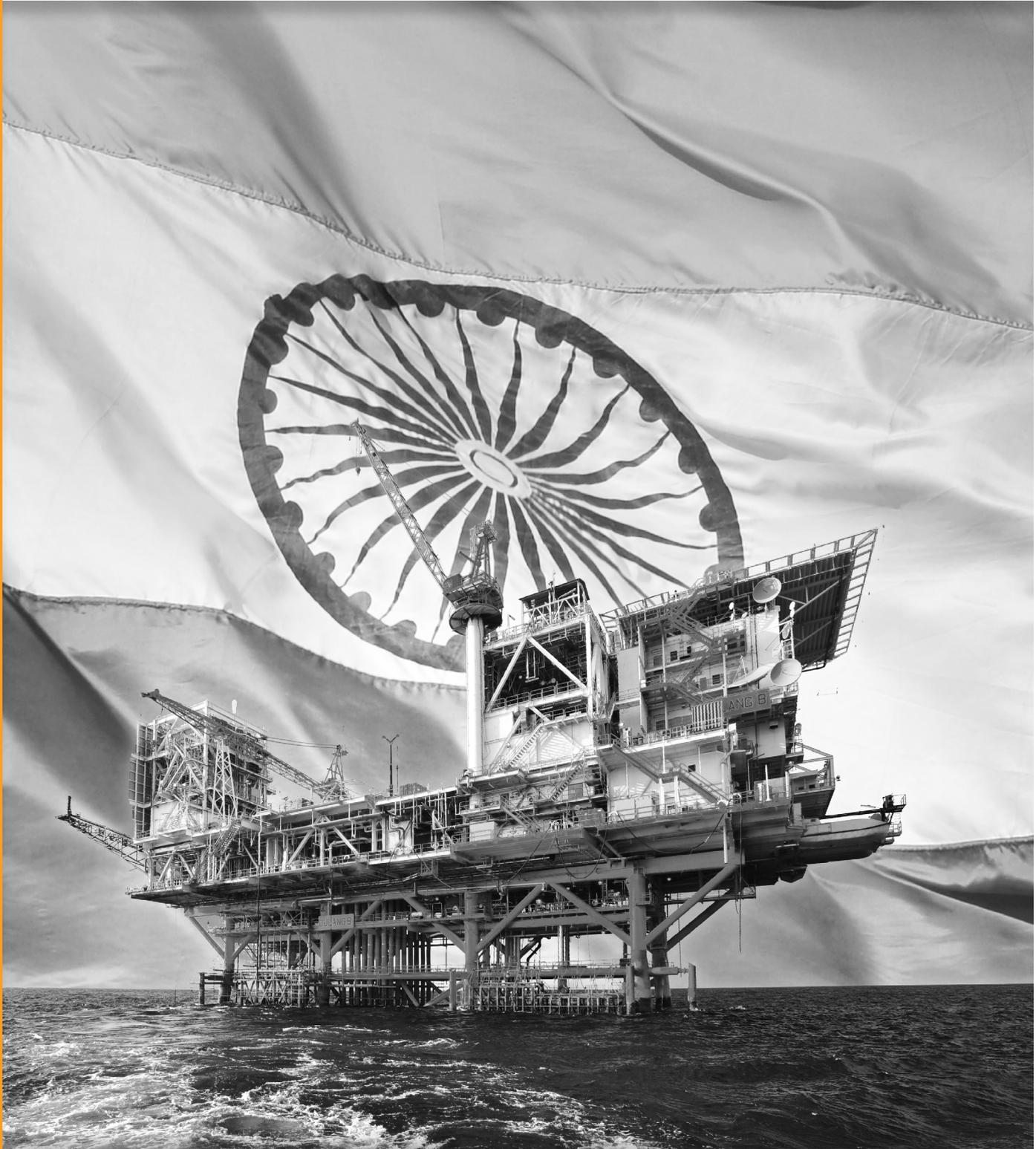


EYE ON

India's Hydrocarbon Sector Investor
Index & Market Survey

Annual PetroFed Awards Ceremony



In Partnership with:





PETROFED

Petroleum Federation of India

Voice of Indian Oil & Gas Industry

About Us

- The Petroleum Federation of India is an apex Society of entities in the hydrocarbon sector and acts as an industry interface with Government and regulatory authorities. It represents the industry on Government bodies, committees and task forces and has been submitting recommendations to the Government on behalf of the industry on various issues.
- It organizes seminars, conferences, workshops, roundtable meetings and brings out study reports and a quarterly journal. It has instituted 15 Awards in 13 categories which are open to all Oil & Gas companies operating in the country. All major companies operating in the Oil & Gas sector in India are members of PetroFed.



Core Purpose Statement

To be the credible voice of Indian hydrocarbon industry enabling its sustained growth and global competitiveness

Shared Vision

- A progressive and credible energy advisory body stimulating growth of Indian hydrocarbons sector with global linkages.
- A healthy and strong interface with Government, legislative agencies and regulatory bodies.
- Create value for stake holders in all our actions.
- Enablers of collaborative research and technology adoption in the domain of energy and environment.
- A vibrant, adaptive and trustworthy team of professionals with domain expertise.
- A financially self-sustaining, not-for-profit organisation.



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Follow us on:

Directing the momentum of Indian Oil and Gas Industry

India's Hydrocarbon Sector Investor Index & Market Survey

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PetroFed Message

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Global Investment Intelligence

PR Partner:



Investment Profile



Survey Analysis

India's Investment Profile

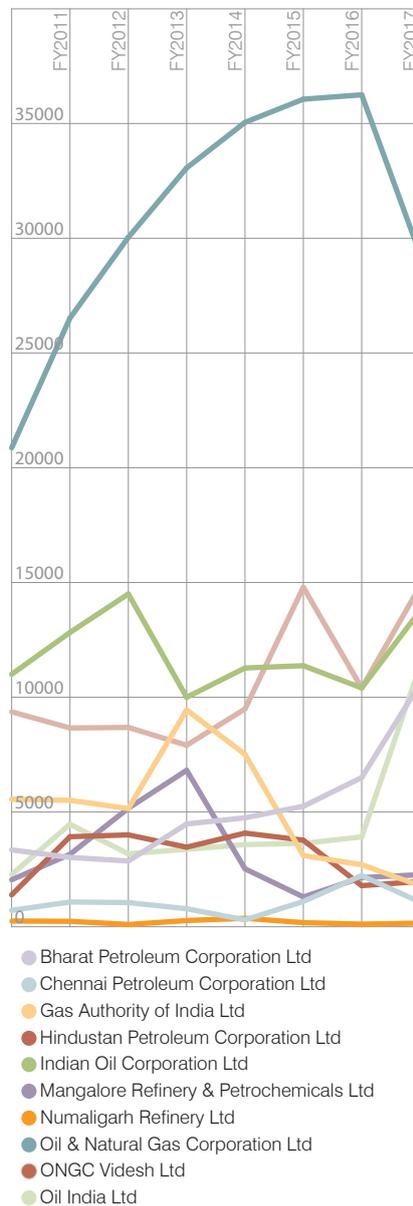
Joining efforts to assess the new business environment in India's hydrocarbon sector, EYE ON and PetroFed are pleased to hereby release the results of their first market survey on India's oil and gas industry. 214 oil and gas executives, industry analysts and policy experts responded to key questions on the market, contributing data to this informative exercise.

In 2015, India's energy consumption rose by 5.2% according to the BP Statistical Review, and the country surpassed Russia to become the third largest energy consumer in the world. Lower oil prices, India's spiraling energy demand and an economy growing at over 7% make the country's hydrocarbon sector a bright spot for oil and gas investors. Reforms carried out by the NDA government since 2014 have been intended to bring new impetus to a sector plagued by bureaucratic hurdles and depleting domestic output, and secure reliable and affordable sources of energy for India's growing population.

A core part of the 25 sectors that are key to Make in India campaign, the oil & gas industry is dominated by state-owned companies, and the sector has witnessed increasing government spending for the past three years. Capital expenditures in FY2015 and FY2017 (projected) are the highest India has seen since FY2010. Both years cross the threshold of the Rs. 80,000 crore, totaling respectively Rs. 80,634.82 crore and Rs. 87,214.36 crore. It has to be noted that over 60% of state-owned companies' capex for FY2017, or Rs. 55,531.89 crore, is reserved by the three upstream-focused corporations, i.e. ONGC, its overseas subsidiary ONGC Videsh, and Oil India Ltd, showcasing a strong will to encourage exploration efforts and boost production at home and abroad.

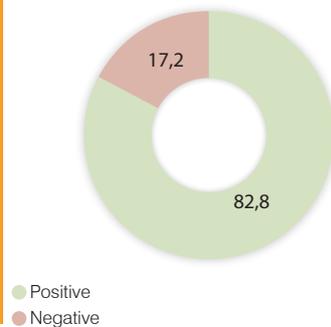
The increase in capex is indicative of a positive sentiment across the industry.

PSUs Capex FY2010-FY2017

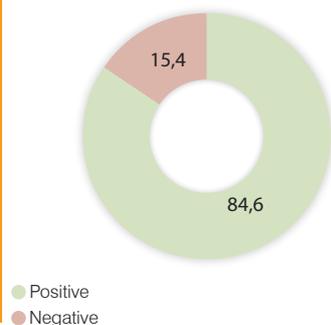


Indeed, EYE ON and PetroFed's survey has found that 82.8% of the industry rates current investment conditions in India as positive, with an even higher number, 84.6% seeing them remaining so for the coming year.

Overall how do you rate the current investment conditions in India's hydrocarbons market?



What are your expectations for the investment conditions over the short term (next 12 months) in India's hydrocarbons market?

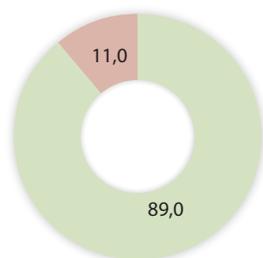


BP's Energy Outlook 2035 forecasts an energy consumption growth of 128 percent in India, driven by a 155 percent growth

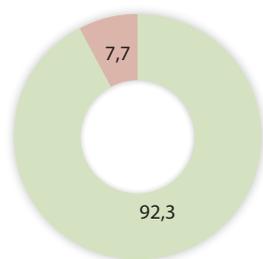


in gas demand and 118 percent growth in the demand for crude oil in the forecasted period. India's voracious appetite for energy will mean sustained investments to boost domestic output and develop infrastructure to meet the country's growing energy needs. The survey results seem to agree with the statement, as the industry sentiment on business and investment opportunities grows more positive with time. With lower oil prices expected to stabilize around \$50 and an economy projected to keep growing at a minimum of 7% in the medium term, 89% and 92.3% of those surveyed think that investment opportunities will exist in the mid- and long-term respectively.

Do you think that Mid Term opportunities will exist to invest in India's oil & gas sector?

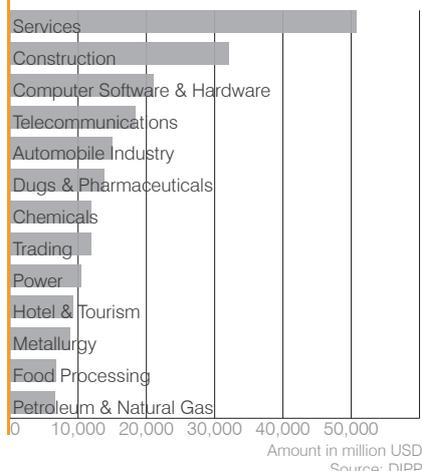


Do you think that Long Term opportunities will exist to invest in India's oil & gas sector?



In the petroleum and natural gas sector, 100 per cent FDI is allowed via automatic entry route in exploration, marketing and natural gas infrastructure, pipelines, LNG terminals, refining etc. Domestic and foreign investments have successfully been made in the sector, notably through local and international private investors like BP, Cairn India, Reliance Industries, Essar Group and Shell.

FDI inflows per sector 2000 - 2016

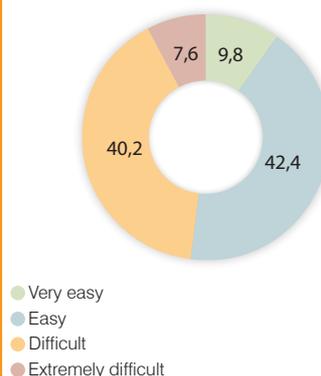


According to the Department of Industrial Policy & Promotion, the petroleum & natural gas sector has totaled \$6.7 billion of FDI equity inflows between April 2000 and March 2016, which represents 2.31% of total inflows in that period. The hydrocarbons sector currently ranks as the 14th most attractive sector in terms of FDI inflows, after key sectors such as services, construction, telecommunications & IT, automobiles, process industries, power, tourism and metallurgy. The sector has had brighter days: in 2010 it was ranked as the 9th most attractive sector in terms of FDI inflows, and was still in the top 10 until the end of 2012. It represented as high as 3% of the country's

total FDI inflows in August 2012. Looking at the numbers however, FDIs in the sector have been substantially increasing since 2012. In FY2013, 2014 and 2015 they totaled respectively Rs. 1,192.57 crore, Rs. 678.39 crore, and finally Rs. 6,473.22 crore.

The level of entrepreneurship witnessed in the sector is a final indicator of the attractiveness of India's oil and gas industry for investors. In line with the StartUp India movement launched by Prime Minister Narendra Modi in January 2016, the hydrocarbon sector is trying to encourage the establishment of start-ups across the hydrocarbons value chain, by exploring the opportunities of setting up a start-up fund and encouraging start-ups to bid during the ongoing auction of the 67 small discovered fields. However, the sector remains a challenging one to start up a business in. Indeed, EYE ON and PetroFed's survey shows that 47.8% of respondents view the setting up of an oil & gas business in India as as a difficult or extremely difficult venture. ■

How would you rate the ease of starting an oil and gas business in India?



Downstream Vision

IndianOil Corporation Ltd (IOCL) is the largest public enterprise in the country with a well-established refining, transportation and marketing network. IOCL and PetroFed Chairman Mr. B. Ashok speaks about market deregulation, investments and the road ahead.



B. ASHOK
Chairman
IndianOil Corporation Ltd
Chairman
PetroFed

To what extent have deregulated retail prices impacted the fuel marketing sector? What is IndianOil's strategy to maintain and/or increase its market share under the new market conditions?

Deregulation has been truly beneficial for IndianOil. While on the one hand IOCL is focusing on competitive marketing by clearly understanding the market forces, investment decisions too are being taken to further strengthen the infrastructure to meet the need of the customers. We are also able to focus more on optimising resources to enhance the Corporation's efficiency, leading to competitive prices to our customers besides providing better customer satisfaction in the competitive scenario.

What are the planned investments of IndianOil in the next five to seven years?

Augmenting our refining and pipeline capacity, fuel quality upgradation, expanding the marketing infrastructure and retailing network are major thrust areas in the core business of the company. Additionally, IndianOil's forays into the petrochemicals and gas business along with exploration and production and alternative fuels remain part of IOCL's future business expansion.

In view of the above, IndianOil intends to make an investment of about Rs. 1,75,000 crore in the next few years, subject to techno-economic feasibility of the projects. Nearly 25% of the proposed investment is envisaged in various refinery projects aimed at capacity expansion, fuel quality improvement and increasing profitability of IndianOil refineries. Concomitant investment of about 25% is envisaged in expansion and modernization of supply chain network. About 20% of the investment is envisaged towards acquisition of upstream assets in pursuit of secured energy supply. Another 30% is being envisaged in petrochemical business to convert commodity products into special grades for enhanced

profitability and expansion of natural gas infrastructure and associated pipeline networks to meet the increasing demand for natural gas.

How are IndianOil's GRMs and what strategy are you devising to further maximise profit from the refining output?

IndianOil's Gross Refinery Margin (GRM) was of \$5.06/b in FY2016. A number of steps have been taken to enhance the operating efficiency and GRM, which include processing new crude grades and enlarging the crude oil basket to help bring down input costs and widen supply sources. In 2015-16, 8 new crude oil grades were processed and a new grade added to the crude oil basket in order to improve cost-effectiveness of importing crude oils and also to reduce dependency on select countries. We have also maximised processing of high-sulphur/ heavy/high-TAN crude oil to the extent of 62% in FY2016. Thrust on implementation of various energy conservation projects, and engaging reputed external agencies for benchmarking and suggesting improvements has also helped.

What is the status and detailed timeline of the Odisha PCPIR where IndianOil is the anchor tenant?

As the anchor tenant, IndianOil has already commissioned the mother unit of the PCPIR – Paradip refinery of 15 MMTPA capacity in February 2016.

Further, the Corporation has started implementing Polypropylene (PP) unit at Paradip for commissioning by March 2018. The production from this plant would meet the PP requirements of end-processors likely to set up units in the PCPIR. IndianOil is also planning to set up another project at Paradip for production of Mono Ethylene Glycol (MEG). This project is expected to be commissioned by the financial year 2020-21.

In addition, IndianOil is also examining the techno-economic feasibility of other proj-

IndianOil intends to make an investment of about Rs. 1,75,000 crore in the next few years, subject to techno-economic feasibility of the projects.

Planned investment in coming years:
Rs. 1,75,000 crore

FY2016 Gross Refinery Margin: **\$5.06 per barrel**

LPG distributorships commissioned in FY2016: **1,200**

Paradip's Polypropylene unit's expected commissioning: **March**

During FY2016, IndianOil has commissioned 1,200 new LPG distributorships, which is 60% of the commissionings by the oil marketing companies (OMCs).

ects at Paradip based on the captive streams available from the refinery.

With India's efforts to curb carbon emissions and overall air pollution, what is the detailed plan and timeline for each of IndianOil's refineries to produce BS-VI compliant fuel?

M/s Engineers India Ltd. has been engaged as the Project Management Consultant for implementation of BS-VI projects in six IndianOil refineries (Panipat, Mathura, Koyali, Bongaigaon, Haldia and Digboi) with September 2019 as the timeline for completion. In case of Barauni refinery, the ongoing BS-IV quality project (phasewise completion starting from March 2017) will be adequate for BS-VI quality products also.

For Guwahati and Paradip refineries also, the refinery configuration required for BS-VI quality products has been evaluated and feasibility studies are in progress. It would be our endeavor to complete these projects also in time for the rollout of BS-VI products across the country by March 31, 2020.

How is IndianOil contributing to strengthening India's LPG distribution networks and channels?

IndianOil is expanding and strengthening its LPG distributorship network and infrastructure to meet the growing demand for LPG arising out of the ambitious plan of the Government of India to release 50 million new LPG connections for BPL families in the next three years. Along with this, connections, as required by the prospective customers also will be released.

During FY2016, IndianOil has commissioned 1,200 new LPG distributorships, which is 60% of the commissionings by the oil marketing companies (OMCs). Out of the total 18,000 LPG distributors in the country as on July 1, 2016, IndianOil has 9,200 distributors.

Further, after unveiling of the Unified LPG Distributor Selection Guidelines, IndianOil, along with other OMCs, is conducting feasibility studies for setting up a large number of LPG distributorship in the country, especially in rural and far-flung areas respec-

tively. IndianOil will continue to contribute to at least 50% of the incremental growth and development of LPG in the country.

In order to meet future LPG demand arising out of above expansion activities, IndianOil, apart from augmenting its LPG import terminal at Kandla, is also setting up greenfield LPG import terminals at Kochi and Paradip. Bottling capacities are being augmented at existing bottling plants and 9 new bottling plants are being set up. We have plans to set up 8 to 10 more bottling plants in the next 5-6 years.

How do you define IndianOil's R&D strategy and focus? What are the challenges and opportunities of indigenising hydrocarbon technologies in India?

IndianOil R&D's Vision-2030 embodies its intent and aspiration to emerge as an "Energy Technology Licensor." It intends to develop and commercialise need-of-the-hour refining technologies, especially for BS-VI quality compliance. Further, our R&D pursuits aim at maintaining IndianOil's pre-eminence in lubricants technology, to develop refining and petrochemical catalysts, and to set up IndianOil Centre for Alternative and Renewable Energy (i-CARE) to undertake focused research in solar power generation, second and third generation bio-fuels, gasification, CO2 utilisation, nano-material research for fuels, lubricants and refining catalysts, etc.

IndianOil's R&D Centre already has a sizeable portfolio of refining technologies (Indmax, Octamax, Zeosom, etc) which are either commercialised or in different stages of validation, adoption and commercialisation. The main challenge of commercialising indigenous refining technologies is lack of or inadequate basic design and engineering capabilities with the process developers. We took note of this fact and are trying to reinforce our manpower on this front so that we will be building these capabilities in-house.

Further, on the policy front, some kind of preference and consideration for indigenously available portfolio of technologies for a given application will facilitate their faster commercialisation. ■

Upstream Pioneer

Established 60 years ago, state-owned ONGC has evolved to become India's leading integrated, global energy company. Chairman & Managing Director D. K. Sarraf sat down with EYE ON to assess the latest reforms impacting India's upstream industry and discuss the company's strategy across the energy value chain.



D. K. SARRAF
Chairman & Managing Director
**Oil and Natural Gas
Corporation Ltd**

How receptive is ONGC to the revenue-sharing contract model and what are its expected impacts for the market?

The implementation of revenue-sharing is one of the greatest reforms in the history of India's oil & gas industry. Since 1999 under the NELP regime, the profit-based production sharing model led to litigation and arbitration disputes between the contractors and the government because of the complex process of determining the contractor's profit and the difficulty in ascertaining the cost recovery. Because most litigations were based on cost determinations, an alternative like revenue-sharing, introduced under the Hydrocarbon Exploration Licensing Policy (HELP), is very welcome in the industry. Under this model, the revenue-sharing is a quoted and biddable number and working out a contractor's revenue is a much easier and more straightforward process. This shall in turn substantially decrease the number of disputes that has impacted the sector in the past.

To what extent has the HELP answered the industry's concerns and expectations?

HELP is not a single reform but is rather bringing about a set of regulatory transformations across the sector. The first concept to be introduced, the uniform licensing policy, will finally enable a contractor to explore and exploit any type of hydrocarbons from a given acreage. This marks a difference from the previous regimes where different hydrocarbons licenses were given by the government for different types of hydrocarbons like conventional crude oil, natural gas, coal-bed methane (CBM) or shale gas for instance. This resulted in contractors who found unconventional hydrocarbons within their conventional blocks to be unable to further explore and exploit such reserves. The situation was detrimental to the country's energy security and the overall economy.

HELP is also introducing the long-awaited Open Acreage Licensing, under which inves-

tors and contractors can select the areas they wish to explore and exploit so that the government can examine the same and put it out for bidding. As a result, investors need not wait for auctions or bidding rounds and can suggest by themselves new areas to bid for throughout the year. Open acreage requires, that the country's seismic data be available for all contractors and investors, and the completion of the country's National Data Repository (NDR) by the Directorate General of Hydrocarbons (DGH) is essential. The availability of seismic data, which is being greatly enhanced by ongoing onshore and offshore seismic surveys being conducted on behalf of the government by ONGC and Oil India, along with the NDR, shall ensure the successful implementation of open acreage in India.

Overall, HELP is both answering the industry's concerns and simultaneously bringing less government interference and intervention in the governance of the sector. As a result, we expect faster and more efficient decision making, which in turn will lead to faster exploration of our sedimentary basins, faster exploitation of India's hydrocarbons reserves, and better investor sentiments for the sector.

How is ONGC preparing to develop an asset like KG-DWN-98/2?

ONGC has been exploring offshore in the Krishna Godavari basin for several years and has made several successful discoveries. Because of their small size and isolation it was not however, economically viable to exploit them individually, thus we have clustered them into three different clusters running from the north to the south of the block. We have identified the cluster-2 as being the most promising and we expect the first gas to come on-stream in June 2019 and first oil towards mid-2020. We project a peak production of 17 mmscmd, which shall represent about 20 percent of India's natural gas production, and 77,000 barrels of oil per day (bopd) from this asset.

The implementation of revenue-sharing is one of the greatest reforms in the history of India's oil & gas industry.

ONGC is benefitting from lower prices for oilfield services and equipment, which allows the company to increase its level of activity while containing its capex below Rs. 30,000 crore

The natural gas pricing reform brought about by the government has been the final green light for ONGC to confirm its \$5.076 billion investment for the project. In addition to the natural gas pricing reform of October 2014 raising the price of domestically produced gas, the government also introduced a separate gas pricing regime for deepwater, ultra deepwater, and high pressure/high temperature gas areas such as the ones in Krishna Godavari. It is with the help of this policy that ONGC has been able, in only two weeks, to seek board approval and announce one of the biggest investment decisions the sector has seen under the current low oil price scenario.

What are ONGC's investment plans and strategy to increase domestic oil and gas output?

After seven to eight years of witnessing a decrease in its domestic production, Oil and Natural Gas Corporation Limited has managed in FY2014 to arrest production decline from its nominated blocks and achieve a marginal increase in production.

Because the country's biggest challenge is reducing dependence on oil imports by 10 percent by 2022, ONGC is undertaking several development and re-development projects across India to boost its domestic output. These no-

Because the country's biggest challenge is reducing dependence on oil imports by 10 percent by 2022, ONGC is undertaking several development and re-development projects across India to boost its domestic output.

tably include Mumbai High North Field Development and Mumbai High South Field Development approved since June and November 2014 respectively. The Daman Development Project, the Vasistha and S-1 Development Project, KG-DWN-98/2, Neelam Redevelopment Project and additional development projects like Bassein and Vasai East are also notable examples of such projects.

FY2017 Capex:

Rs. 29,307 crore

FY2016 net profit:

Rs. 16,004 crore

Discoveries made in FY2016:

17

FY2016 domestic crude oil production:

25.93MMT

What is ONGC's investment strategy to further integrate itself across the energy value chain?

Most of ONGC's first integration projects are commissioned and operational. In 2014, we completed the commissioning of our 726.6MW gas-fed power plant in Tripura, run by ONGC Tripura Power Company, which has greatly contributed in monetizing the gas reserves of North East India.

In Mangalore, ONGC Mangalore Petrochemicals Ltd (OMPL) has been successfully commissioned in 2014 and is being fed from our adjacent 15MTPA Mangalore Refinery & Petrochemicals Ltd (MRPL) to produce paraxylene and benzene. We now intend to integrate both entities by merging them to create even more value for our shareholders. MRPL is already producing BS-IV compliant fuels and in line with the directives of the Government has drawn up the required plans for implementing upgradation projects to produce BS VI grade of fuels by 2020. Refinery is also drawing up plans for expansion to 21MTPA.

In Gujarat, the long-delayed \$4 billion petrochemical plant run by ONGC Petro Additions Ltd (OPAL) shall be commissioned by September 2016 and will have India's biggest dual feed cracker, which is also one of the biggest in Asia.

Finally, in line with the company's commitment to sustainable development and the environment, ONGC intends to increase its renewable energy portfolio. While we already have 51MW of wind capacity in Gujarat and 102MW in Rajasthan, the company intends to foray into solar generation taking ONGC further in its path of being a sustainable and eco friendly company. ■

India's Hydrocarbon Market Survey Results



Survey Analysis

2 Years of Reforms

The International Energy Agency predicts that India's dependence on oil imports is set to increase to 83 percent by 2025 and 91% by 2040. Similarly, it sees natural gas import dependence increasing to 53% by 2025 and stabilising at 49% by 2040. In 2015, meanwhile, Prime Minister Narendra Modi set a target of decreasing the nation's oil imports by 10% by 2022.

With these projections as the backdrop for change, the Ministry of Petroleum & Natural Gas has embarked on a set of aggressive reforms since 2014, to improve sector governance and facilitate much-needed investments across the country's hydrocarbons value chain, especially in the upstream and infrastructure areas. The one-month long survey conducted by EYE ON and PetroFed proposes to assess this set of reforms and the sector climate in light of the industry's feedback. With 214 respondents from across the sector's value chain and both the public and private sector, the survey gives an objective, an objective picture of the industry's sentiment vis-à-vis investment conditions in the sector today.

Nearly 150 years after India's oil first sputtered out of a hand-dug well in Assam, the country's hydrocarbon sector is at a cross roads. India's dependence on oil imports stands at about 80 percent, with domestic production of 36.9 million metric tons in FY2016. Imports, meanwhile, crossed the historic threshold of 200 million tons, reaching a record high 202.9 million metric tons the same fiscal. Similarly, the story of India's natural gas sector is characterized by increasing imports to meet a demand that stood at 446mmscmd in FY2016 while domestic gas production reached its lowest level in 8 years, totaling 31,138.48 mmscm in FY2016.

Guided by a mandate to reduce import dependence by 10% by 2022, policy reforms since 2014 have touched on all aspects of

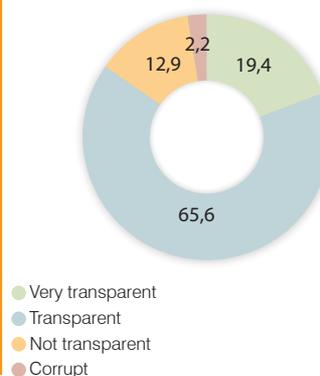
the hydrocarbons value chain. A few initiatives like Pradhan Mantri Ujjwala Yojana (PMUY), Give It Up and PAHAL Direct Benefit Transfer in LPG have explicitly proven the Government's consumer-centric approach and commitment to provide clean, reliable and affordable energy to all. The first such initiative, PAHAL Direct Benefit Transfer in LPG, was launched in January 2015 and has become the largest direct cash transfer scheme in the world, reaching over 150 million consumers. It is estimated that Rs. 32,000 crore of subsidy has been directly transferred into bank accounts and over Rs. 21,000 crore of subsidy has been saved. The Give It Up campaign was launched a few months later, in March 2015. It has so far succeeded in over 10 million consumers giving up their LPG subsidy, resulting in about 6.5 million underprivileged being given new LPG connections. Finally, in May 2016 PMUY was launched, which is targeting the set up 50 million LPG connections for the poorest citizens under a budget of Rs. 8,000 crore. The overall increase in LPG coverage since the NDA government took office in 2014 has been the highest in the country's history, totaling over 36 million new connections since 2014.

Committed to India's sustainable development, the MoPNG and the Prime Ministry, has also multiplied green initiatives and reforms to contribute in decreasing the country's carbon footprint. A major initiative in this regard is the thrust towards a gas-based economy, with the development of brownfield and green-

field LNG terminals and the expansion of the country's gas pipelines network by 15,000 kilometres. The Ethanol Blended Programme is another example of a green initiative, requiring oil marketing companies to sell ethanol blended petrol with up to 10% ethanol.

Additional policy moves have been targeted at restoring investors' trust and boosting investments in the sector. EYE ON deems that the policy moves have succeeded in restoring trust and confidence in the governance of the hydrocarbon sector, with 85% of the industry estimating that policy reforms have brought more transparency to the industry.

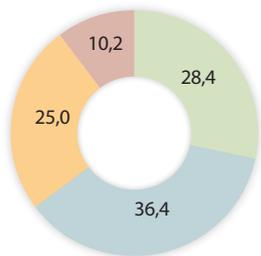
How would you rate the change in the level of transparency in India's hydrocarbons market in view of recent policy changes?



In October 2014, the diesel price deregulation ended the subsidy burden and increased competition in the fuel marketing sector. 36.4% of those surveyed expect

more spending on infrastructure and social areas following diesel price deregulation.

What is the main way that diesel deregulation is impacting the market?



- OMCs can increase investments in both existing and new assets on account of no under-recoveries
- Reduced subsidy burden on Government, allowing more spending on infrastructure and social sector
- Opens up the sector to competition from private retailers
- Helping bridge gap of petrol & diesel prices, thereby curbing diesel consumption

The upstream sector's regulatory framework has seen a number of transformations over the past two years. From October 2014 onwards, the new gas pricing formula was implemented to increase the price of domestically produced gas and encourage further monetization of the country's gas reserves. Pricing and marketing freedom has also been given for gas produced from HP/HT reservoirs and deepwater and ultra deepwater areas. It is expected that up to 6.75Tcf of gas reserves worth up to Rs. 150,000 crore could be monetized following such policy moves.

In March 2016, the introduction of the Hydrocarbon Exploration & Licensing Policy (HELP) for forthcoming bid-

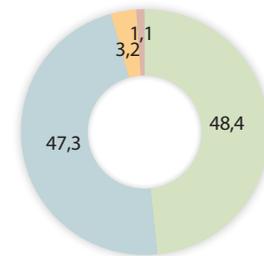
ding rounds completed a period of total re-engineering of the upstream sector. HELP notably provides the long-awaited open acreage licensing policy but also provides a single license for exploration and production of all types of hydrocarbons, under a revenue-sharing model, along with pricing & marketing freedom. The same principles will apply to the auction of 67 discovered small fields in 46 contract areas, under the small discovered fields policy of 2016, which is expected to expedite the monetization of Rs. 70,000 crore worth of oil & gas reserves.

The usage of gas has also been encouraged through landmark reforms including gas pooling mechanism and a gas supplies to stranded power plants. Since Cabinet approval was given in March 2015, fertilizer plants benefit from pooled gas to feed their urea units, which has resulted in an increase in gas consumption from urea units from 41.91mmscmd in FY2015 to 44.08mmscmd in FY2016, and a production increase of 2 million metric tons from existing assets. Similarly, 16GW of power generation has been revived by facilitating gas supplies to stranded gas-based power plants across the country.

The reforms brought about by the MoPNG since 2014 mark a clear difference with previous policies and make a good consensus within the sector. EYE ON and PetroFed's survey shows that over 95% of the industry deems the new policies to be pro-business. It is however noticeable that 47.3% of respondents still think that

this pro-business approach retains a few restrictions.

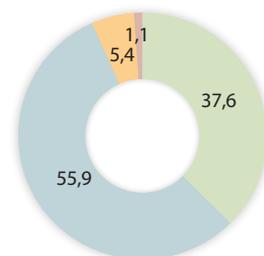
How do you see the change in recent policies of the government vis-à-vis the oil and gas industry?



- Pro-business
- Pro-business, but restrictive
- Anti-business, but accommodating
- Anti-business

Sector growth is expected to be positively impacted, with over 93% of those surveyed expecting the hydrocarbon sector to grow in the next five years. ■

How do you expect the new policies impacting the growth of India's hydrocarbon sector in the next five years?



- Significant growth
- Moderate growth
- Moderate decline
- Significant decline

HELP is on the way for India's E&P Sector

The Hydrocarbon Exploration Licensing Policy (HELP) is India's new and improved contractual and fiscal model that is aimed at boosting exploration and production from licenses across the country. The policy also brings new impetus to develop both unconventional and deep-water oil and gas fields.

HELP is a major departure from the New Exploration Licensing Policy (NELP), intended to enhance domestic oil and gas production, attract investment in the energy sector and create jobs in India's fast growing economy; an economy that currently imports three-fourths of its oil usage and a third of its gas demand.

HELP, approved by the Indian Cabinet in March 2016, is very different from NELP:

Blocks	Duration	NELP Royalty Rates (%)		HELP Royalty Rates (%)	
		Oil	Gas	Oil	Gas
Shallow Water	-	10	10	7.5	7.5
Deep Water	first 7 years	5	5	0	0
	after 7 years	10	10	5	5
Ultra Deep Water	first 7 years	5	5	0	0
	after 7 years	10	10	2	2

Source: MoPNG

1. One license for all: Under NELP, companies are required to obtain separate licenses to explore different types of hydrocarbons. So, while exploring for conventional oil, if a company stumbles upon shale oil, it would need a new licence to produce that oil, increasing the cost.

Under HELP, companies can produce all types of hydrocarbons - oil, natural gas, coal-bed methane, shale oil, shale gas and gas hydrates - under a single license and policy framework. This is timely, since some types of hydrocarbons like shale oil and gas and gas hydrates were not even known or

technically viable for production in India when NELP was introduced.

2. Smooth flow of revenue: Contracts under NELP require companies to share a part of their profits with the government, and until there is cost recovery, no money is paid to the government except for cesses and royalties. This exposed companies to excessive micro-management as the government tried to ensure that costs are not inflated to delay payment from profits, causing delays and disputes.

HELP has thus replaced this clause with a revenue sharing model, whereby bidders will have to quote a revenue share in their bids. The flow of money will start for the government as soon as the discoveries start producing oil or gas, without waiting for the cost of the project to be recovered. This will also end the government's need for constantly verifying operator's expenses, which in turn reduces issues of trust and gives companies operational freedom.

3. Freedom to pick blocks: Under NELP, companies can only explore in blocks that the government has put up for auction through tender. This restricts companies to explore other possible reserves until the time these are brought to the bidding stage, curtailing chances of additional discoveries.

HELP cuts the red tape and offers an 'Open Acreage Licensing Policy'. Here, a bidder can approach the government and seek permission to explore any block, without waiting for a formal bid round. Its Expression of Interest would be examined and if it is found suitable, there will be a call for bids

DIFFERENCES HELP/NELP

Parameters	NELP	HELP
Fiscal Model	Profit-sharing	Revenue-sharing
Cost Recovery	Yes	Not applicable
Cost Efficiency	Neutral	Encouraged
Royalty	Standard rates	Low rates for offshore
Exploration Period	7 years for onland and shallow water; 8 years for deepwater	8 years for onland and shallow water; 10 years for deep and ultra deep water
Management Committee	Technical and financials examination	No micro-management. More focus on reservoir monitoring.
Revenue to Government	From profit petroleum, after cost recovery	On production
Exploration in Mining Lease areas	Not allowed	Allowed
E&P activity for all	Not allowed	Allowed

Source: MoPNG

after necessary clearances. This is expected to speed up the study of unexplored and under-explored areas, leading to additional discoveries. The National Data Repository will be of aid in this open acreage policy.

4. Freedom in gas pricing: In the NELP era, the price of gas was fixed by the government, leading to revenue losses. Gas pricing thus became a contentious issue between producers and the government and even led to litigation in some cases.

To avoid such future scenarios, HELP gives the contractor the freedom to price and market the gas it produces based on the arm's length principle. The government, for its part, takes a share of the profit based on the higher of prevailing international crude price or actual price.

5. Low or no royalties: Cost of exploration and production always varies based on the location of the reserves. However, royalties that companies pay under NELP do not distinguish between low-cost and low-risk shallow fields and high-cost and high-risk deep and ultra-deep water fields, reducing incentive for exploration companies to go for riskier ventures.

HELP provides incentives to solve this, with a concessional royalty regime for deep-water and ultra-deep water areas. Companies do not have to pay any royalty for the first seven years and then pay concessional royalty of 5% (for deep water) and 2% (in ultra-deep water). In shallow water too, the royalty rates have been cut from 10% to 7.5%. This will reduce fixed costs and is expected to spur more E&P activity. ■

Survey Analysis

Policy Reform

The implementation of HELP is seen as a much-needed reform of an upstream industry that has been struggling for years to bring new impetus for companies to explore India's sedimentary basins and boost domestic production.

When asked about the best ways to decrease dependence on oil imports by 10% by 2022, 34.1% of those polled expressed a desire to see additional private investment in the upstream sector, and 25% of respondents would like to see exploration activities being further encouraged.

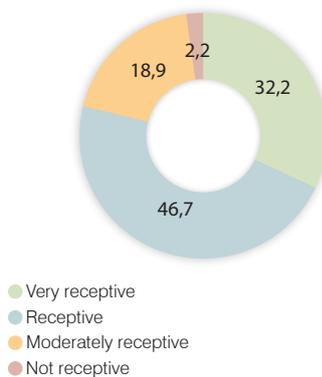
What do you think should be the primary focus of the government and the industry to reduce India's hydrocarbons import dependency by 10%?



The revenue-sharing model found in the upstream policies announced in 2016: the Hydrocarbon Exploration Licensing Policy (HELP) and the Marginal Fields Policy, had already been floated for comment on the MoPNG's website in May 2014. While switching to a revenue-sharing model has been the subject of much debate for years, it seems that the industry is starting to reach a consensus on the benefits of this model, with nearly 80% of respondents responding positively. Only 21.1% of those

surveyed remain moderately receptive or not receptive to revenue sharing models.

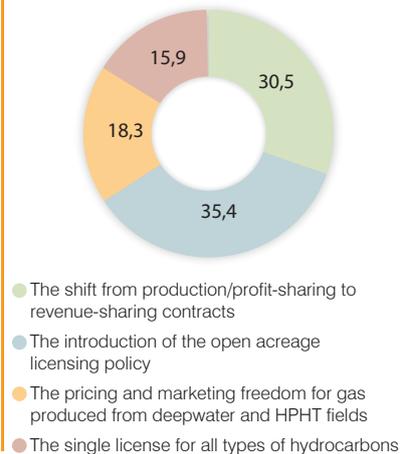
How receptive are you to the shift from production/profit-sharing contracts to revenue-sharing contracts?



However, it seems that what the industry is welcoming the most from HELP is the introduction of the long-awaited open acreage licensing policy, by which operators can choose the blocks they want to offer without waiting for the Government to put them up for bidding.

HELP, however, will need a coherent implementation from the Government and strong industry support to succeed. While the policy answers several of the industry's expectations, including a single license for all types of hydrocarbons, and scrapping cost-recovery, its success will be subject to an overall strong sector governance and ease of doing business. 30% of people surveyed think a better ease of granting licenses and approvals is a must to facilitate investments in the sector, and an almost similar share think that fiscal

What are the main advancements brought about by the HELP?



stability and reduced bureaucracy needs to be the focus of the Government if upstream investments are to be boosted. When they are considered together, these figures demonstrate a strong industry will to improve the ease of doing business in India's hydrocarbons sector. ■

What can bring in more investment in India's hydrocarbon sector?



Discovered Small Field Policy

With domestic oil and gas production gradually falling and India's energy consumption spiraling up, a new push to increase domestic output has commenced. The Discovered Small Field Policy is supporting efforts to monetize India's small discovered fields, with combined proven and probable reserves valued at around Rs 70,000 crore.

Distribution of offered discovered small oil and gas fields

State	Number of fields	Reserves
Mumbai Offshore	29	55.5 MMT
Assam	13	23 MMT
Andhra Pradesh	15	4.4 MMT
Gujarat	6	4.1 MMT
Tamil Nadu	2	0.4 MMT
Rajasthan	2	0.1 MMT

Source:Indiadsf

Estimated oil and gas reserves (million metric tonnes) for small fields per location

Basin	Offered Contract Areas	Number of fields
Cambay	5	5
Cauvery	2	2
KG-Onland	7	8
Assam-Arakan	9	13
Rajasthan	2	2
Vindhyan	1	1
Onshore Total	26	31
Mumbai Offshore	13	27
Kutch Offshore	2	2
KG-Offshore	5	7
Offshore Total	20	36
Grand Total	46	67

Source:Indiadsf

In spite of the fact that small discovered fields in India held combined proven and probable reserves valued at around Rs 70,000 crore, for years these small, energy-rich fields remained economically unviable. Despite a wealth of 2D and 3D seismic data being collected, the fields were surrendered to the government, unexploited.

Dawn of New Incentives: In September 2015, the Government sanctioned the Discovered Small Field Policy, formerly known as the Marginal Field Policy. The new regulation permitted the auctioning of the formerly discovered 67 fields under 46 contract areas. The bidding round was launched in May 2016 with a series of incentives. These include:

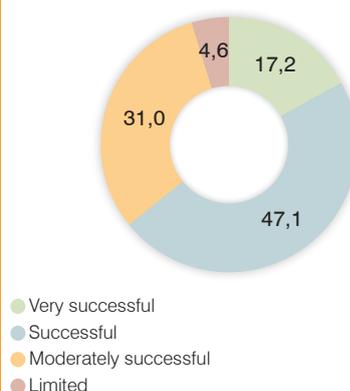
1. One license for conventional and unconventional hydrocarbons permits contractors to explore all types of oil and gas resources.
2. There will be freedom of oil and gas pricing.
3. There will be no time constraint on exploration activity. The contractor can carry out exploration activity during the entire contract duration, which is up to 20 years and extendable for another 10 years.
4. The contracts will be awarded on the basis of revenue sharing after the onset of production instead of the contentious cost-recovery model to reduce regulatory hurdles in field monetization.
5. Bids can be made by national oil companies, Indian private companies and foreign companies; either independently or in JVs. Up to 100% participation of foreign companies and JVs is allowed.
6. No prior upstream experience is required for bidding, leaving the bid round open to non-exploration and production focused companies and oil and gas startups with new technology.
7. Operators will be provided ease of exit and there will be no minimum work program.
8. There will be exemption from oil cess and

custom duty.

9. Royalty rates will be 12.5% for onshore, 10% for offshore and 5% for deepwater areas, the same as under the New Exploration Licensing Policy (NELP) regime.
10. There will be no upfront signature bonus – a first in the world for discovered fields.

The Bidding Process: The bidding round opened on July 15 and will remain open until October 31, 2016. The bids will be awarded within two months of the closure of the bidding round, and the contract will be signed within a month from the date of the award.

What degree of success do you anticipate for the forthcoming small discovered fields bidding round?



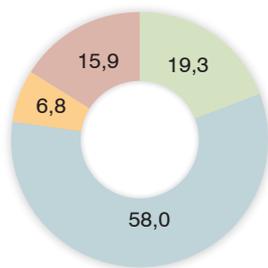
About the reserves: The fields were discovered by ONGC and OIL between 1970 and 2005 and are spread across Mumbai Offshore, Assam, Andhra Pradesh, Gujarat, Tamil Nadu and Rajasthan. Of the 46 contract areas 26 are onshore, 18 are in shallow water and two are deepwater. The fields are estimated to hold more than 48 million metric tonnes of in-place oil reserves and more than 38 billion cubic feet of gas reserves. To aid production companies in the development of the licenses the government has made 2,042 line km of 2D seismic, 1,336 square km of 3D seismic and 130 wells' geo-scientific data available. ■

India's steady transition to a gas-based economy

The story of India's natural gas sector is that of falling domestic production, increasing LNG imports and a widening supply-demand gap that is unlikely to be filled in the coming years. EYE ON's market survey asked respondents to comment on the initiatives being taken to address the challenges in the nation's gas industry.

The current gas sector challenges, along with the country's commitment at the United Nations Paris climate conference in December 2015 to cut carbon emissions, has pushed the Indian government to bring in sweeping policy changes to give a thrust to the domestic gas market. Indeed, the PetroFed and EYE ON survey shows a large majority of respondents of an opinion that developing a gas-based economy is the most efficient way to curb CO₂ emissions in India.

What is the most efficient way to curb CO₂ emissions in India?



- Encourage the use of biofuels
- Further encourage the country towards a gas-based economy
- Develop the electric cars industry
- Increase energy efficiency

In 2015-16, the country's total gas demand was 446 mmscmd which is projected to go up to 606 mmscmd by 2021-22, an expected demand jump of nearly 37%. In comparison, current supply at 306 mmscmd is projected to rise to 531 mmscmd in the next six years, with pipeline imports finally taking off.

Given these projections, the government, for its part, has taken a series of mea-

asures to push up gas availability. The policy moves include:

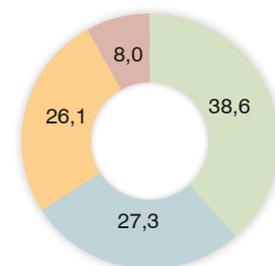
1. Introducing a new gas pricing formula to make production attractive
2. Intensifying exploration and production of conventional and non-conventional reserves
3. Acquiring and developing gas assets in foreign countries
4. Starting efforts to seal long-term LNG import contracts at low prices and also importing gas via pipelines
5. Announcing a new Hydrocarbon Exploration and Licensing Policy (HELP)
6. Providing pricing and marketing freedom for gas recovered from high pressure high temperature, deepwater and ultra reserves
7. Opening 67 small oil and gas fields for auction
8. Expanding the gas transportation and LNG regasification infrastructure
9. Increasing the penetration of the city gas distribution network

New Pricing: India has 47 trillion cubic feet (tcf) of proven gas reserves – 66% of which are found offshore. A majority of these reserves, especially in the gas-rich, deep-water Krishna Godavari (KG) basin off India's eastern coast, remains untapped. Of the 109 gas discoveries made since 2011, production has started in only 24 due to pricing hurdles and high production costs given the difficult nature of the reserves.

Given these projections, India has taken a series of measures to ensure gas availability. The policy moves notably include the introduction of a new gas pricing

formula to make production more attractive. In October 2014, to arrest declining production, the government introduced a new pricing formula, whereby domestic gas prices are benchmarked to prices at a clutch of international gas hubs in the US, the UK, Canada and Russia. The industry has been responsive to the policy move, with only 8% not expecting any change as a result of a new gas pricing formula. Indeed, up to 38.6% of those surveyed are expecting increased investments in the gas sector from now on. Almost a third of respondents also expect the same policy move to finally help monetising deepwater and HP/HT gas reserves. This is already materializing with ONGC's announcement of a \$5 billion investment to develop its deepwater KG gas asset.

How do you assess India's gas pricing reforms since October 2014?



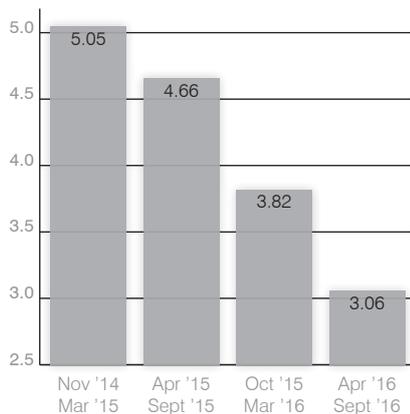
- Will boost overall investments in the sector
- Help developing deepwater and HPHT areas on fast-track
- Increase gas share in total energy mix in India
- No change expected

The formula also fixes the price every six months, based on trailing price and volume data of the previous four quarters with



a one-quarter lag. Since then, the prices, based on gross calorific value (GCV), have fallen steadily— from \$5.05/mmBtu to \$3.06/mmBtu for a 22-month period starting Nov 2014.

Domestically produced natural gas price based on new pricing formula (2014-2016)*

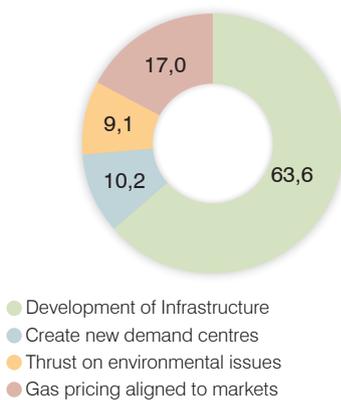


*Prices in dollar per mmBtu basis gross calorific value
Source: Petroleum Planning and Analysis Cell

The government has now also granted marketing and pricing freedom for gas produced from high-pressure high-temperature, deepwater and ultra deepwater areas. The easing is part of the new Hydrocarbon Exploration and Licensing Policy (HELP) of March 2016, which also allows for a uniform license for exploration and production of all forms of hydrocarbons and an open acreage policy, and replaces the cost recovery model with the revenue sharing model. As a result, state-run ONGC is investing \$5 billion in developing its gas assets in the deepwater KG basin, coinciding with the government granting pricing freedom from gas produced from deep-water reserves. ONGC expects to supply 16.29 mmscmd of natural gas from the project by 2020.

Gas Usage: Gas' share in India's fossil fuel energy mix today stands at 7%, this is compared with coal at 43% and oil at 22%. Thus a lot must happen in terms of supply before the country can be put on the path towards a "sustainable gas economy," as Minister for Petroleum & Natural Gas Dharmendra Pradhan has advocated. When surveyed, a sweeping 63.3% of industry leaders agreed on the necessity of developing the country's infrastructure to further accelerate gas usage and increase the share of gas in the country's energy mix.

Which of the following in your view would accelerate the gas usage in India at par with global average?



India's gas infrastructure is rapidly expanding, driven first by a massive gas pipeline expansion. The current gas pipeline network extends across approximately 16,250 km with a total capacity of 350.5 mmscmd, and it is being expanded by 12,687 km. As of mid-2016 there were 13 pipelines under-construction in India and nine new pipelines planned, adding to the network of 22 existing pipelines, according to EYE ON's pipeline projects database.

Given the growth opportunities in the LNG sector, investments have also in-

creased in setting up LNG terminals from where gas imports, predominantly from Qatar, are being regasified and distributed in India via pipelines. There are currently four LNG regasification terminals – in Dahej, Hazira, Kochi and Dabhol – with capacity utilization ranging from 5.6% for Kochi to 110% for Dahej. These four terminals are undergoing capacity expansions totaling 10.5 MTPA.

According to EYE ON research, the numbers of LNG terminals are set to multiply across the west and the east coasts, with 16 new projects in different stages of planning or construction. New companies are entering the fray, leading to an expected massive increase in regasification capacity. Though all planned projects might not materialise, EYE ON's LNG database indicates that up to 72.65MTPA of greenfield LNG capacities could be added in the coming years.

The path ahead: The daily natural gas requirement in India, according to government data, is 78 million standard cubic metres a day (mscmd), but it is expected to grow to 117 mscmd by 2022. At the same time, however, domestic gas production fell by another 3.8% in 2015, its fifth continuous year of decline. The International Energy Agency (IEA) estimates that India's natural gas consumption will reach 175bcm by 2040, when it estimates that domestic production will reach not more than 89bcm. As a consequence, the IAE estimates that natural gas import dependence is set to increase to 53% by 2025 and 49% by 2040. All eyes are now on the potential of the national gas market and the pressing need to monetize the country's gas reserves and build up the necessary infrastructure to meet increasing domestic demand. ■

Questions & Results

Survey conducted between June 21st and July 28th 2016.

Results are calculated from 214 respondents from across the public and private sector.

Index Questions

Overall how do you rate the current investment conditions in India's hydrocarbons market?



What are your expectations for the investment conditions over the short term (next 12 months) in India's hydrocarbons market?



Do you think that mid term opportunities will exist to invest in India's oil & gas sector?

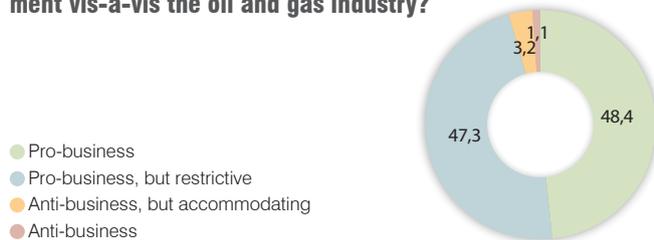


Do you think that long term opportunities will exist to invest in India's oil & gas sector?



Investor Survey

How do you see the change in recent policies of the government vis-à-vis the oil and gas industry?



How would you rate the ease of starting an oil and gas business in India?



How would you rate the change in level of transparency in India's hydrocarbons market in view of recent policy changes?



How would you categorize your overall investment and growth strategy in India?



How do you expect the new policies impacting the growth of India's hydrocarbon sector in the next five years?

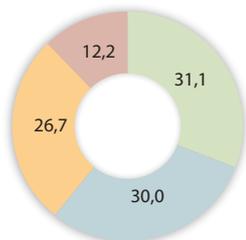


Questions & Results

Market Survey

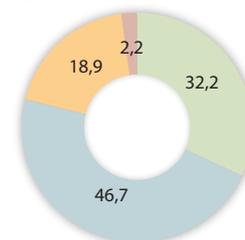
What can bring in more investment in India's hydrocarbon sector?

- Market driven commodity prices
- Ease of granting licenses and approvals
- Fiscal stability and reduced bureaucracy
- India's oil & gas market should open to global competitiveness



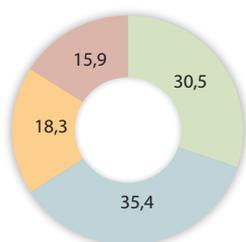
How receptive are you to the shift from production/profit-sharing contracts to revenue-sharing contracts?

- Very receptive
- Receptive
- Moderately receptive
- Not receptive



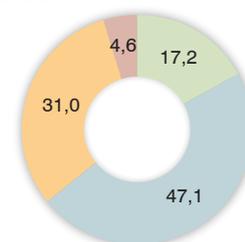
What are the main advancements brought about by the HELP?

- The shift from production/profit-sharing to revenue-sharing contracts
- The introduction of the open acreage licensing policy
- The pricing and marketing freedom for gas produced from deepwater and HPHT fields
- The single license for all types of hydrocarbons



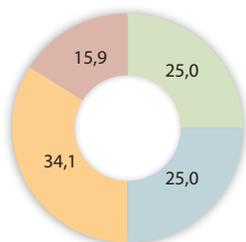
What degree of success do you anticipate for the forthcoming small discovered fields bidding round?

- Very successful
- Successful
- Moderately successful
- Limited



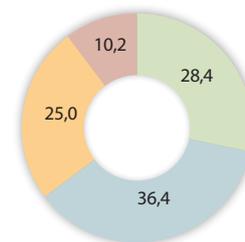
What do you think should be the primary focus of the government and the industry to reduce India's hydrocarbons import dependency by 10%?

- Encouraging exploration of India's sedimentary basins
- Increasing India's E&P portfolio and investments abroad
- Boosting private investments in the domestic E&P sector
- Decreasing consumption by switching to alternative fuels and sources of energy



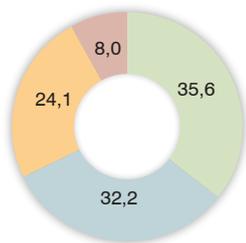
What is the main way that diesel deregulation is impacting the market?

- OMCs can increase investments in both existing and new assets on account of no under-recoveries
- Reduced subsidy burden on Government, allowing more spending on infrastructure and social sector
- Opens up the sector to competition from private retailers
- Helping bridge gap of petrol & diesel prices, thereby curbing diesel consumption



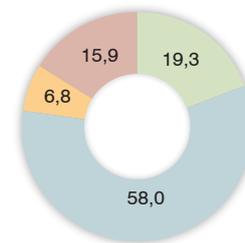
What is the best way to increase technology deployments in India's hydrocarbon sector?

- Increase spending on R&D in Hydrocarbon sector
- Further develop cooperation with international services providers
- Increase collaboration with international research and educational institutions
- Encourage development & deployment of indigenous technologies



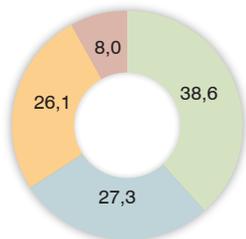
What is the most efficient way to curb CO2 emissions in India?

- Encourage the use of biofuels
- Further encourage the country towards a gas-based economy
- Develop the electric cars industry
- Increase energy efficiency



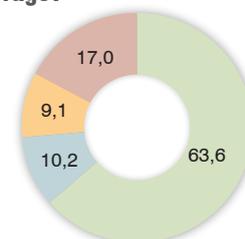
How do you assess India's gas pricing reforms since October 2014?

- Will boost overall investments in the sector
- Help developing deepwater and HPHT areas on fast-track
- Increase gas share in total energy mix in India
- No change expected



Which of the following in your view would accelerate the gas usage in India at par with global average?

- Development of Infrastructure
- Create new demand centres
- Thrust on environmental issues
- Gas pricing aligned to markets





Message from the Director General Petroleum Federation of India

In a bid to boost domestic oil and gas production, Ministry of Petroleum and Natural Gas, Government of India has initiated several policy reforms which are also aimed at creating an atmosphere of trust, transparency and ease of doing business. It is expected that the initiatives of the Government of India will repose confidence in the investors who have been looking forward to positive policy changes.

India is now moving towards a new era of hydrocarbon production, driven by a forward looking Hydrocarbon Exploration and Licensing Policy (HELP); and a new fiscal model based on Revenue Sharing Contract. This new phase is a move ahead from the earlier NELP; and Production Sharing Contract regime and addresses various industry concerns that led to slowdown in investment over the last few years. Single license for exploring all forms of hydrocarbons, graded system of royalty rates, pricing and marketing freedom for crude oil and natural gas, and the open acreage policy are some of the highlights of HELP.

Ministry of Petroleum & Natural Gas, Government of India has recently announced the commencement of the 'Discovered Small Fields Bid Round-2016' in New Delhi when Shri Dharmendra Pradhan, Hon'ble Minister of State (I/C) for Petroleum and Natural Gas launched the new bidding round along with technical information portal and e-bidding portal. Discovered Small Fields i.e. oil and gas blocks which have so far remained commercially undeveloped, are now in focus as the central government seeks to boost domestic hydrocarbon production.

As India is moving towards simpler and transparent administrative and fiscal systems, PetroFed associated with EyeOn who desired to conduct a market survey on 'India's Hydrocarbon Sector Investor Index & Market Survey'. The idea is to get the feedback on how the investors perceive the business environment related to Oil and Gas sector. The results of this survey to be presented during the annual awards function of PetroFed may also help defining the future policies and plans by all stakeholders to further boost the activities in the Indian hydrocarbon sector.

Dr. R. K. Malhotra

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