

Management Discussion & Analysis



MANAGEMENT DISCUSSION AND ANALYSIS

GLOBAL ENERGY SECTOR: AN OVERVIEW

Primary energy consumption (13511 MToE) showed growth in comparison to 2017 and it was the fastest since 2013. The growth of 2.2% was mainly contributed by OECD, particularly the European Union. Natural gas contributed maximum in growth, followed by renewables and oil. For the 17th consecutive year, China was the largest growth market with growth of energy consumption of 3.1% YoY (3132MToE)

Due to growth in global GDP in 2017, energy demand was higher than previous year. In the global energy mix, share of coal fell to 27.6% (3731 MToE). Coal consumption growth center were mainly India & China with 424 MToE & 1893MToE consumption respectively.

In Natural Gas, production (3680 bcm) & consumption (3670 bcm) both shown growth of 4% & 3% respectively. Consumption growth was fastest since 2010. The growth in production was mainly from Iran and Russia while consumption was mainly due to China, Middle East & Europe.

Natural Gas contributed maximum in energy growth due to coal to gas switching program in industrial and residential sector in China. LNG consumption showed a growth of over 10% (290 MT) in 2017 driven by China's increasing demand (39 MT) which has displaced Korea (38 MT) to become second largest importer of LNG after Japan.

The average crude prices increased for the first time since 2012 by 24%. It was around \$54.19 /bbl in 2017. However, due to higher demand in China and USA consumption grew by 1.8% from the previous years. Global Oil production grew by 0.6 million b/d, main contributor in growth were USA & Libya, however Saudi Arabia & Venezuela decreased their production in 2017.

Renewable energy sector showed strong growth due to addition of 400GW in solar PV and 515GW in wind generation capacity. Renewable was the second largest contributor in primary energy growth and recorded the largest increment of 307tWh (17%).

(Source: BP Statistical Review of World Energy)

LNG Industry Outlook

International trade in LNG continues to be one of the most vibrant segments of the world's natural gas value chain, growing in 2017 by 35.2 MT to 293.1 MT in global trade. That represents growth of 12% and comes as projects in Australia and the United States bring new capacity on line and Asian markets continue to grow. China and South Korea led Asian growth with additional demand of 12.7 MT and 4.9 MT respectively. China has focused on aggregate energy demand toward natural gas and away from coal in its fight against air pollution. Further, FSRUs will make up for a significant part of the total global import capacity in the coming years.

Non-long-term trade (which includes "spot market" activity) increased yet again, reaching over 88 MT in 2017 and accounted for 30% of total gross LNG trade. U.S. shale gas continues to moderate North American natural gas prices through technology and efficiency improvements, which translates into lower U.S. feedstock costs. Global LNG prices have seen a considerable rebound. After falling to \$5.28/MMBtu in August 2017, landed Northeast Asian spot prices reached an average \$9.88/MMBtu by January 2018 owing to the effects of a cold winter and strong demand from China due to environmental regulations.

The prices continue to hold strong in mid-2018 as well with JKM rising to \$10/mmbtu levels. However, there are 92MTPA of liquefaction capacity under construction world-wide, and it is expected about one-third to come online during 2018 this year. FID activity globally remains low in comparison to previous years with only one project reaching FID. The higher seasonal demand indicates that the global LNG market can remain balanced – or even tight – in the winters as new LNG export capacity ramps up.

Thus far, the global market is absorbing new supply with minimal distortion, as new buyers and existing markets alike demonstrate a high need for natural gas

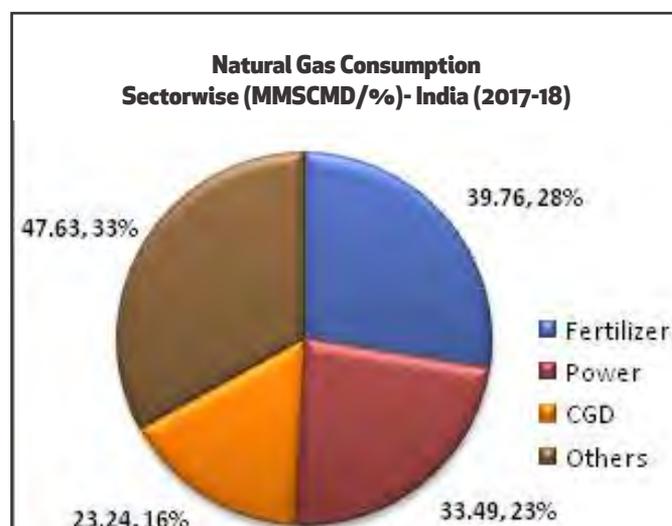
to meet growing energy demand. The need for cleaner fuels is a key part of this trend. Rising penetration of renewable energy will expand LNG's role in providing flexible power generation to balance the electricity grid in many major economies. The use of LNG in the industrial and transport sectors will push up gas demand, particularly in Asia where environmental concerns are on the rise.

Indian LNG demand is up by 20% and Chinese LNG demand is up 50% during 1st half of 2018. In South and Southeast Asia, LNG demand will be primarily driven by power demand growth and a reduction in local gas production. However the incremental supply during 2018 and following years may impact the demand- supply balance going and moderate the LNG prices. With the successful commencement of supplies from three long-term LNG contracts in 2018, GAIL is well positioned to cater to India's LNG demand in the future years. The onset of GAIL's US LNG contracts have presented an opportunity to have an LNG portfolio with Henry Hub (HH) indexed as well as Crude Oil indexed LNG for supply to Indian customers.

Natural Gas in India

India's primary energy consumption rose by 4.6% (753 MToE) in 2017 taking its share of global primary energy to 5.6%. Natural Gas share in the Indian energy mix for year 2017 is 6.18% (54.2bcm).

Around 143 MMSCMD of natural gas was consumed during 2017-18 while net LNG and domestic gas sales stood nearly equal. India has imported a record 72 MMSCMD of gas i.e. 20 MTPA of LNG during the period. Natural gas imports in the country rose by 9% y-o-y. These volumes will further grow as delivery of cargoes from new contracts has already commenced. Natural gas is seen to dominate the mainstay sectors of fertilizer and power. It is also a preferred fuel in households and industries.



(Source: PPAC)

The Indian gas market structure has greatly benefitted from low crude price scenario and has gradually built up an optimum LNG portfolio mix with LNG indexed to Henry Hub and crude oil. This portfolio approach will help India obtain best bargains in any price scenarios and enhance security of supply.

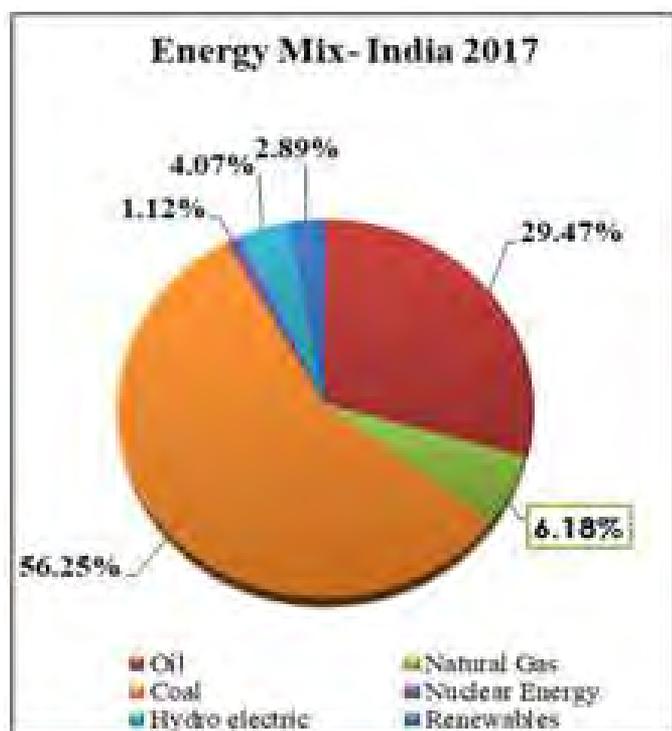
The Government of India (GoI) is focusing on increasing the share of natural gas in Indian Primary Energy mix from the present level. For this, the government has launched various projects like the 'Urja Ganga project', and has also set a target to connect 1 crore households through Piped Natural Gas (PNG) connections by FY 2019-20. The Urja Ganga project is a 2,655 km long project, also known as Jagdishpur-Haldia & Bokaro-Dhamra Pipeline project, and will connect eastern parts of the country to the National Gas Grid. This pipeline has been further extended by adding 727 kms from Barauni to Guwahati. The current capacity of RLNG terminals in India is 30 MTPA and is

likely to increase 2-3 times by 2029-30, assuming all the planned terminals in India would materialize.

Energy-intensive industries in Indian cities have adopted natural gas as their primary source of energy. This share of industrial use is set to further increase after the Supreme Court order of banning use of Petcoke in and around New Delhi in October 2017.

The Natural Gas (NG) consumption in the CGD sector has shown a 15% CAGR in the last three years consuming 23.24 MMSCMD in FY 2017-18. With the thrust of the government on increasing the presence of PNG and CNG in the cities and towns of India, including the use of LNG /LCNG for transportation on the Highways, the retail sector is poised to contribute significantly to the growth of Natural Gas consumption in the country.

To ensure a continued advantage for gas-based growth, the inclusion of natural gas /LNG under the Goods & Services Tax (GST) system is essential. Competing solid and liquid fuels have gradually transitioned into the GST structure while natural gas, being an environment-friendly fuel, still awaits its complete inclusion in the GST system.



PRESENCE IN THE INDIAN MARKET

Operational Performance

Your Company registered an all round physical growth in the FY 2017-18 as compared to FY 2016-17 adding significantly to the top-line and bottom-line of the Company:

Particulars	2017-18	2016-17
Natural Gas Throughput (MMSCMD)	105	100
Natural Gas Trading (MMSCMD)	85	81
Liquid Hydrocarbon Sales (TMT)	1,276	1,110
Polymers Sales (TMT)	674	577
LPG Transported (TMT)	3,721	3,362

NG Marketing

Natural gas trading continues to be the focus area of your Company. During FY 2017-18, gas sales clocked 84.05 MMSCMD in India (out of total sale of 85 mmcmd), compared to 81.21 MMSCMD in the previous financial year. Domestic gas available to the Company for marketing increased to 51.94 MMSCMD in FY 2017-18 as against 48.8 MMSCMD in the previous financial year while contributing 61% to the marketing volume. The balance volume of 39% was serviced through imported long term and spot volumes. Major supplies of natural gas include fuel to power plants, feedstock for gas-based fertilizer plants, City Gas Distribution (CGD), LPG extraction and consumption in other industrial sectors. Your Company holds around 60% market share in India's gas marketing business.

Fertilizer Sector

Your company markets gas for 75% of the fertilizers produced in the country. During FY 2017-18, your Company firmed up Gas Supply Agreement with upcoming fertilizer plants for about ~ 12 MMSCMD and supply of gas shall commence progressively from early 2019.

Power Sector

Consequent to the expiry of the PSDF Scheme of Ministry of Power for the gas based power sector w.e.f. 01.04.2017, GAIL continues to explore opportunities for supply of natural gas to gas based power generation units at affordable prices.

City Gas Distribution

The total sale volume to CGD sector continues to show positive growth. Your Company caters to around 26 number of CGD companies supplying gas (CNG, PNG & Industrial Gas) to 70 cities

Transmission

Natural Gas

Your Company owns and operates a network of around 11,400 kms of natural gas high pressure trunk pipeline with a pan-India capacity. The average gas transmission during the year 2017-18 was 105.23 MMSCMD, compared to 100.4 MMSCMD in the previous financial year.

LPG

Your Company is unique in India to own and operate 2038 kms of exclusive pipelines for LPG transmission for third-party usage across two major networks. Jamnager-Loni Pipeline (JLPL) and the Vizag-Secunderabad Pipeline (VSPL) networks both of which together achieved a throughput of 3.72 MMTPA during the year against 3.36 MMTPA in the previous fiscal year. The design capacity of JLPL is being augmented from 2.5 to 3.25 MMTPA and is expected to be commissioned in 2018.

Petrochemicals

Your Company has doubled the polymer production capacity from 410 Kilo Tons per annum (KTA) to 810 KTA at Pata. Your Company's petrochemical subsidiary (70% equity holding) Brahmputra Cracker & Polymer Limited (BCPL) has a capacity of 280 KTA. The marketing right of the BCPL plant is with your Company taking the total marketing portfolio to 1090 KTA. Further, your Company has a joint venture with ONGC and GSPC i.e. ONGC Petro- Additions Limited (OPAL) with a 1400KTA capacity plant at Dahej.

Overall production from the Petrochemicals complex in 2017-18 was 671KTA during the year. Your Company exported 56,345 MT of polymers to Asian markets. Your Company's market share in the domestic polyethylene market has been maintained and is the second largest player in the Indian market with a portfolio of over 1000 KTA of polyethylene. Your Company and BCPL together have a combined production share of 21.4% of the High Density and Liner Low Density



Shri Subir Purkayastha, Director (Finance) (centre), Shri Gajendra Singh, Director (Marketing) (2nd from right), Shri A K Tiwari, Executive Director (Finance) (2nd from left) and Shri Kamal Tandon, Executive Director (Marketing) (right) addressed the Investors and Analysts Meet 2018

Polyethylene market in the country. A combined volume of 880 KTA of polymers including that of BCPL was marketed by GAIL during the year.

Polymer prices were mostly suppressed during the year and made a recovery in the last quarter of the fiscal year. However overall prices registered a decline by about 2% on year on year basis.

BCPL has achieved 78% capacity utilization in FY 2017-18 registering a positive EBIDTA of ₹ 332 crore and cash profit of ₹ 83 crore despite negative PAT of ₹ 80.38 crore in its second year of operation.

➤ **LPG and Other Liquid Hydrocarbons**

Your Company has six LPG plants at five locations in the country having a production capacity of 1.5 million MT. In 2017-18, total liquid hydrocarbon production was about 1.28 Million MT, of which over 80% constitutes LPG and Propane. Your Company's LPG sales increased by about 15% during the year.

➤ **Exploration & Production**

Your Company now has participating interest in ten E&P blocks of which eight blocks are in India and two blocks in Myanmar. Out of these, your Company is Operator in one onland block viz. CB-ONN-2010/11 in the Cambay basin. Exploratory wells have been drilled in this block and oil discoveries have been notified in 2 wells.

Pursuant to optimization of E&P portfolio, production is in progress from 4 blocks and balance 6 blocks are in various stages of Exploration (1 block), Appraisal (3 blocks) and Development (2 blocks). Further, your Company has participated in blocks on offer under Open Acreage Licensing Policy (OALP) – I bid round in the Cambay, Rajasthan and Assambasins.

➤ **Non-Conventional Energy**

Your Company is committed to reduce carbon emission and implement renewable energy projects. Your Company has a total installed capacity of 128.71 MW of alternative energy; out of which 117.95 MW is wind and 10.76 MWp is solar energy. Your Company has commissioned a 5.76 MWp grid connected roof-top captive solar power plant at the Pata Petrochemical Complex, Uttar Pradesh which is the country's second largest industrial PV roof top solar plant and also first Roof Top Solar Plant in Hydrocarbon Industry in India. The power generated is being consumed within the Petrochemical complex and substitute power is being drawn from the grid. This arrangement is significant in cost reduction and also reducing the carbon footprint of GAIL.

Further, rooftop solar units are being installed at your Company's offices/work centers for captive use.

➤ **City Gas Distribution**

Your Company is currently operating in 38 number of cities through-out

India directly and through its eight Joint ventures/ subsidiaries in the major cities of Delhi, Mumbai, Hyderabad, Bangalore, Pune, Varanasi, Patna etc. These CGD's together caters to 24 lakh households out of the 43 lakh total PNG household connections in the country. Out of total 1,424 CNG stations in the country, your Company's group operates 915 CNG stations. The current fiscal year registered record addition of 5 lakh households and 120 CNG stations.

Your Company's 100% subsidiary GAIL Gas Ltd., and its JVCs are operating in 11 geographical areas including the IT capital of the country, Bengaluru. The Bengaluru CGD project is making significant progress in its initial years. Around Rs 600 crore has been incurred towards laying of the 2,684 Inch-km pipeline network, providing connection to over 50,000 households, and commissioning of five CNG stations. Around 5,000 households are already drawing PNG along with 70 Nos. of industrial and commercial connections. GAIL Gas has registered an impressive financial performance with its turnover increase from ₹2,798 crore to ₹4,586 crore and PAT from ₹65 crore to ₹81 crore in FY 2017-18.

Your Company has been awarded six cities as part of Urja Ganga project namely, Varanasi, Bhubaneswar, Cuttack, Patna, Ranchi and Jamshedpur. In addition, your Company will execute a CGD project in Kolkata through a JV between GAIL and a Govt of West Bengal Company. Gas supply through pipeline and cascades has commenced in Varanasi, Bhubaneswar and Cuttack in the first quarter of current financial year 2018-19. Ground work for laying the CGD network in Patna, Ranchi and Jamshedpur has also started.

Further, your Company has succeeded in setting up more than 1,200 kms of Green corridor, namely, Delhi-Mathura-Agra, Mumbai-Pune Expressway, Kanpur-Lucknow, Udaipur-Agartala-Khowai.

PRESENCE IN THE GLOBAL MARKET

Your Company is constantly expanding its global presence through its participation in projects / ventures along the natural gas value chain. Your Company is evaluating various global opportunities with the prime objective of securing gas supplies for energy security of the country and acquiring technical know-how for the upstream sector.

Your Company is a part of a consortium in two offshore E&P blocks (A-1 & A-3) in Myanmar. Around 14 MMSCMD of gas is being produced from these blocks, and supplied to China through the South East Asia Gas Pipeline Company Limited (SEAGP), in which your Company is also an equity partner. Your Company has achieved a major milestone of becoming a gas producer as well as supplier outside India.

Your Company owns a wholly owned subsidiary namely, GAIL Global (Singapore) Pte Ltd (GG SPL) in Singapore. GG SPL is actively involved in business activities in the area of LNG Trading. GG SPL has traded 31 LNG cargoes in 2017-18 as against 23 cargoes in 2016-17 and has registered an increase in turnover to USD 834 million in 2017-18 as against USD 493 million in the previous year.

Your Company has also established its wholly owned subsidiary namely, GAIL Global (USA) Inc. during FY 2011-12 to monitor investments made in the Eagle Ford Shale acreage of Carrizo Oil & Gas Inc in the State of Texas, and to explore other business opportunities related to the natural gas sector in North America.

Further, GAIL Global (USA) LNG LLC, a step-down subsidiary under GAIL Global (USA) Inc., entered into a Terminal Service Agreement (TSA) with Dominion Cove Point LNG LP for booking 2.3 MMTPA liquefaction capacity in the Cove Point LNG liquefaction terminal project located at Lusby in the state of Maryland in the US.

Your Company is also playing a lead role in the Turkmenistan-Afghanistan-Pakistan-India (TAPI) natural gas project for import of gas to India from Turkmenistan. Various agreements related to gas supply and transportation

have already been concluded. Further, TAPI Pipeline Company Limited (TPCL), the Pipeline Consortium, has been incorporated in Isle of Man to build, own, and operate the TAPI Pipeline, and State Concern TurkmenGas has been appointed as the Consortium Leader. The Shareholders Agreement and Investment Agreement of TPCL have been signed and the pre-FID activities are in progress. The Front End Engineering Design (FEED) for the project has been completed.

The major outstanding issues are (i) Economic Viability, (ii) Security of Supply and (iii) Tie-up of Debt and Equity for the Project. TPCL is in the process of engaging a Financial Advisor to carry out detailed Financial Due Diligence and achieve Financial Closure. Further, taking into cognizance of current gas market, India has proposed for re-negotiation of Gas Sale Purchase Agreement, the discussions for which are ongoing between GAIL and TurkmenGas. Further, three Business Principles governing the conduct and basis of business of TPCL have been proposed by India covering the security aspects of gas supplies.

Your Company holds equity interest in two companies in Egypt, namely Fayum Gas Company (FGC) and National Gas Company (Natgas), the city gas distribution companies involved in the supply of natural gas to residential, commercial and small industrial customers in Egypt. The investment in Natgas was made through GGSPL. Political uncertainty in Egypt during 2011-12 affected all foreign investors in Egypt including GAIL. However, over the last few years, the situation in Egypt has improved and these companies are making profits.

Your Company is also an equity partner in China Gas Holdings Limited (China Gas), a retail gas company involved in city gas and CNG business in China.

FINANCIAL PERFORMANCE

➤ Capex

Your Company's capex plan, especially in the pipeline segment is progressing smoothly. As against a target of ₹ 3,851 crore (including equity contribution to subsidiary and JV), your Company made a Capex of ₹ 4,080 crore during the FY 2017-18.

➤ Profitability

The turnover in FY 2017-18 increased by 10% to ₹ 53,690 crore against ₹ 48,789 crore in the previous year. The PAT increased to ₹ 4,618 crore in 2017-18 against ₹ 3,503 crore in the previous year, an increase of 32%. This is the highest ever PAT reported by your Company.

➤ Shareholders' Funds

The Reserves and Surplus (excluding Transition Reserve & Other Comprehensive Income) at the end of the FY 2017-18 stood at ₹ 32,947 crore as compared to ₹ 30,996 crore in the corresponding previous year. As on March 31, 2018, net worth of the Company stood at ₹ 35,142 crore, as compared to ₹ 32,350 crore as on March 31, 2017.

➤ Debt and Interest

Debt-Equity ratio as on March 31, 2018 improved to 0.06:1 as compared to 0.16:1 as on March 31, 2017. The Debt Service Coverage Ratio was 3 times as on March 31, 2018 as against 2 times on March 31, 2017. This reflects the strong financial position of your Company and ability to take up new projects.

As against the total Foreign Currency Loans of ₹ 1,580 crore outstanding as on March 31, 2018, around 84% (i.e. ₹ 1,321 crore) is hedged with full currency swaps, 13% (i.e. ₹ 215) is naturally hedged and only 3% (₹ 44 crore) remains un-hedged.

Your Company has repaid loans of around US\$ 33 million each to Bank of Tokyo, SMBC and Mizuho during FY 2017-18. Further, your Company has also repaid US\$ 150 million from the syndicate of SMBC, DBS and Mizuho during FY 2017-18. Your Company also exercised call option (pre-payment) of ₹ 937.50 crore in respect of two INR Bond series aggregating to ₹ 1,250 crore.



Shri A K Tiwari, Executive Director (Finance) (centre) and senior officials at the Investors Conference at Singapore (Nomura Investment Forum Asia 2018)

➤ Ratio Analysis

Return to Net Worth (PAT/Net Worth) for the Company as on March 31, 2018 improved to 13.14% as compared to 10.83% as on March 31, 2017.

Return on Capital Employed (PBIT/Capital Employed) increased to 15.38% in FY 2017-18 as compared to 12.55% in FY 2016-17.

Debtors Turnover (Net Credit Sales (i.e. Gross Turnover)/Average Trade Receivables) for the Company as on March 31, 2018 stood at 13.63 Times as compared to 12.78 Times as on March 31, 2017.

Inventory Turnover (Cost of Goods Sold/ Average Inventory) was 52.11 Times as on March 31, 2018 as compared to 48.37 Times as on March 31, 2017.

Current Ratio (Current Assets/ Current Liabilities) for the Company as on March 31, 2018 stood at 1.02:1 as compared to 1.09:1 as on March 31, 2017.

Operating Profit Margin (%) (Operating Income (Operating EBIT) / Revenue from Operations (Net) X 100) for the Company as on March 31, 2018 stood at 13.39% as compared to 12.66% as on March 31, 2017.

Net Profit Margin (%) (Profit after Tax (PAT) / Revenue from Operations (Net) X 100) for the Company as on March 31, 2018 stood at 8.58% as compared to 7.17% as on March 31, 2017.

➤ Market Capitalization

Market capitalization of the Company increased from ₹ 63,669 crore on March 31, 2017 to ₹ 74,090 crore on March 31, 2018, indicating investors' sustained confidence in the long-term growth of your Company.

INITIATIVES AND STRATEGY FOR FUTURE GROWTH

Strategy

In line with the strategy formulated during the year 2011, your Company has been treading on the path of moving from being a natural gas Company to an integrated energy Company with global footprints, which is reflected from the strategic moves taken in the past particularly in the area of international LNG sourcing, expansion of gas infrastructure, expansion of polymer portfolio etc. In the period 2014 to 2016, GAIL faced temporary setbacks in gas marketing and polymer segments due to drastic slump in global crude prices and reduced domestic gas consumption. However, your Company showed strong resilience in the 2017-18 and achieved highest ever profitability with enhanced gas sales and liquid hydrocarbons production.

With changed business environment in India as well globally, your Company has taken up fresh Strategy exercise to define the next phase of growth. In this exercise, your Company shall be chartering strategic initiatives under each business area of gas marketing, gas transmission, petrochemicals, liquid hydrocarbons, city gas distribution and other businesses including imperatives on the skill and talent development.

This strategy exercise shall lay high stress on new business opportunities within or outside energy sector which have the potential to turn into long term growth engine for GAIL. This strategy shall include short, medium and long term strategic moves spanning up to year 2030 to shape your Company of future.

Initiatives

➤ Natural Gas Transmission

Your Company is committed to increase natural gas penetration in the country and as a twin approach, increase the physical network and customer focus in the existing network to both large and small customers. Accordingly, your Company has provisions in the gas transmission contracts to accommodate the requirement of small volume shippers. Your Company has also introduced an Imbalance Management Services for shippers to manage the imbalances efficiently. An online portal for open access request processing is under construction and shall be launched shortly.

To ensure higher utilization of the commissioned trunk pipelines, 26 new Last Mile Connectivity were rolled out to supply/transport gas during FY 2017-18.

Your Company is currently executing 5,165 kms of pipeline (including JLPL augmentation project) with a capex of ₹ 23,903 crore, which will bring natural gas to the Eastern, North Eastern and Southern part of the country.

➤ Adding capacity to the National Gas Grid

Your Company is implementing the following major Natural Gas pipelines (approx. 4,927 Kms) as part of the cross-country National Gas Grid:

1. Kochi-Koottanad-Bengaluru/Mangalore Pipeline (Phase-II, 879 kms): Construction work of Kochi to Mangalore pipeline (434 Km section) is in full swing and is expected to be completed by February 2019.
2. Vijapur-Auraiya-Phulpur Pipeline: In order to de-bottleneck the upstream network of the JHBDPL project, a parallel pipeline from Vijapur to Auraiya and upto Phulpur (672 kms) is under execution in phases. Phase-1 from Auraiya to Phulpur is expected to be completed by December, 2018. Your Company has also awarded orders to execute phase-2 of the pipeline, from Vijapur to Auraiya.
3. Jagdishpur- Haldia & Bokaro-Dhamra Pipeline (JHBDPL) (2,655 Kms): The construction of the pipeline system is under progress in phases. The pipeline will be further extended from Barauni, Guwahati. Out of this, 110 km of Phulpur to Varanasi pipeline has been successfully completed and commissioned.
4. Barauni- Guwahati Pipeline section as an integral part of JHBDPL (727 Kms): Procurement and construction activity started in FY 2018-19.

Your Company shall connect the existing natural gas grid with Eastern India under "Pradhanmantri Urja Ganga Pipeline Project". The pipeline shall pass through the Eastern part of U.P., Bihar, Jharkhand, Odisha, West Bengal and Assam. This pipeline shall supply gas to fertilizer plants at Gorakhpur, Barauni and Sindri. The pipeline shall have two gas sources, one at Phulpur (Allahabad, U.P.) and the other at Dhamra RLNG Terminal (Odisha). The capacity of the pipeline network is 16 MMSCMD. Physical progress is in line with the envisaged schedule.

This trunk pipeline investment could trigger cascading investments through infrastructure creation in City Gas Distribution, LNG terminal, fertilizer plant revival etc. amounting to over ₹50,000 crore in near future by various investors.

To develop the Gas Pipeline Grid in the North East connecting Guwahati to major cities in the North East like Itanagar, Numaligarh, Dimapur, Imphal, Aizwal, Agartala, Shillong, Silchar, Gangtok, etc., a Joint Venture Company

(JVC) will be formed with the five Oil & Gas PSUs viz. IndianOil, ONGC, GAIL, OIL and NRL.

➤ City Gas Distribution

The Pradhanmantri Urja Ganga Pipeline Project endeavors to provide clean fuel to various cities along the pipeline. City Gas Distribution networks along the pipeline at Varanasi, Patna, Ranchi, Jamshedpur, Cuttack and Bhubaneswar are being concurrently developed. Gas supply has been commenced in Varanasi and Bhubaneswar and is ready for supply in Cuttack. Ground work for laying the CGD network in cities namely, Patna, Ranchi and Jamshedpur, has also started. Kolkata CGD is being developed through a JV of GAIL and Greater Calcutta Gas Supply Corporation Ltd (Government of West Bengal Enterprise).

GAIL Gas Limited, your Company's wholly owned subsidiary, is implementing CGD projects in the cities of Dewas, Meerut, Sonapat, Bengaluru & Taj Trapezium and, through its JVs, in Kota, Haridwar, North Goa and Vadodara.

Your Company's subsidiaries and joint venture companies engaged in CGD are participating in the 9th round of CGD Bidding through GAIL Gas Limited, as announced by PNGRB, in which 86 new Geographical Areas (GAs) have been identified.

Your Company has also conducted various efficiency enhancement projects, such as the Rich-Lean Gas corridor and the waste heat recovery projects at Hazira & Vijapur, respectively. Pipeline replacement projects in the KG Basin, Gujarat and Cauvery basin are also progressing in full swing. 242 Km network in the KG basin, 91 Km network in the Gujarat region, and 92 Km network in the Cauvery Basin are commissioned, and balance job is under progress.

➤ Sourcing & Trading of Gas

India has set an ambitious target for share of natural gas in the country's energy mix. In order to ensure that availability of gas supplies are not an impediment in the development of gas sector in India, your Company with a long term vision, during the early part of this decade, had taken proactive steps for contracting gas. GAIL had contracted LNG from USA (5.8 MMTPA) and Russia (2.5 MMTPA). That vision materialized in 2018 with commencement of supplies from Sabine Pass, Cove Point and Gazprom, thereby catapulting GAIL amongst the league of top 10 LNG portfolio holders (~ 14MTPA). The supplies from Sabine Pass commenced in March 2018, from Cove Point in April 2018 and Gazprom in June 2018.

Further, your Company imported LNG cargoes during the financial year from various international sources on short-term and spot basis to cater to the requirement of the domestic market. Your Company has also sold LNG cargoes in the International market during the last financial year, marking an important milestone for the Company.

Further, GAIL continues to source and market LNG from Qatar and Australia apart from cargoes through spot purchase and medium term contracts. Through long term contracts, Your Company has created geographical and indexation diversification of LNG supplies. Linkage to different indices in its LNG portfolio has mitigated risk and has allowed GAIL to offer stable and competitive pricing to its consumers.

Owing to slump in crude prices and gas demand in the country, last couple of years have been challenging for GAIL. However through various measures, GAIL has been able to successfully manage the volume exposure owing to new supplies. GAIL is now actively trading LNG in the international market & chartering ships which is in line with the globalization strategy and allows GAIL to channelize supplies as per the demand in the Indian market. Your Company has concluded various deals towards de-risking the portfolio significantly including time swap & destination swap transactions to ensure delivery of competitively

priced LNG in the Indian market. Further, your Company is actively undertaking hedging to manage commodity price risk. All the above has resulted in substantial savings & GAIL has been able to make available natural gas for the Indian market at a reasonable price.

Demerger of RGPPL resulting in separation of LNG terminal into Konkan LNG Private Limited (KLPL) has further strengthened GAIL's position in the Indian gas market. The access to the Dabhol LNG terminal would provide greater operational flexibility to your Company in the LNG business.

With significant uptick in crude prices and strong growth in gas demand in India and abroad, the LNG trading business of the company is on a strong ground.

➤ **LNG Shipping**

Currently, your Company has hired its first LNG vessel 'Meridian Spirit' on time charter basis in September 2017. The vessel did its first loading at Sabine Pass terminal in Louisiana, USA and discharged at Dabhol terminal, India in March 2018. Your Company also has plans to hire more number of ship(s) in future based on the requirement of transporting volume to India/ elsewhere subsequent to international sales and swap transactions.

➤ **LNG Regasification Terminals**

Your Company is evaluating various opportunities for setting-up/booking LNG Regasification capacity in the country. GAIL achieved another milestone by signing Tolling Agreement with Dhamra LNG Terminal Pvt. Ltd. for 1.5 MTPA Regas Capacity at Dhamra LNG Terminal, Odisha as a step forward for securing RLNG/LNG supply in Eastern Region. This is over and above the capacity already booked at Dahej, Kochi and Dabhol.

Consequent upon demerger of RGPPL and formation of Konkan LNG Private Limited to run the LNG terminal at Dabhol, the terminal has been successfully revived and is today capable of importing 1.9 MT of LNG. Further, the terminal's ability to run 5 MT capacity would be possible once the construction of breakwater is undertaken which is scheduled to be completed by March 2022.

➤ **Petrochemicals**

In order to place your Company as a significant petrochemical producer and marketer, especially in Asia, focus was given to develop export capability by increasing the capacity utilization as well as by improving the number and quality of grades produced. Your Company exported 56 TMT of polymers as a step in this direction. Your Company has successfully captured the petrochemical market of neighboring countries, SEA countries and China.

➤ **Coal Gasification**

Your Company is also entering into coal gasification by setting up of surface coal gasification based urea project at Talcher. The project, with an estimated cost of ₹ 11,611 crore is envisaged for the production of 2,200 MTPD ammonia and 3,850 MTPD urea. A joint venture company, Talcher Fertilizers Limited was formed with consortium partners namely GAIL India Limited (GAIL), Coal India Limited (CIL), Rashtriya Chemicals and Fertilizers (RCF) each having 29.67% stake and Fertilizer Corporation of India Limited (FCIL) having 10.99% equity. Captive Coal Mine allocation & Environment Clearance for the project has been obtained. The pre-project activities are underway.

➤ **Start-up Initiative**

Your Company has launched its Start-Up initiative 'Pankh' to nurture the spirit of entrepreneurship. A corpus of ₹ 50 crore has been created to help start-up entrepreneurs realize their potential. Your Company will also provide mentoring to them in core areas of the organization. A separate web portal has been launched on the corporate website of the

Company where start-ups can submit their investment proposal. Investment Agreements were signed with 4 start-ups during the year for a total commitment of ₹ 5.12 crore.

RISKS, CHALLENGES AND MITIGATION

➤ **Regulatory Framework**

The Petroleum & Natural Gas Regulatory Board (PNGRB) was established by the Central Government on October 1, 2007 for carrying out the various provisions of the PNGRB Act, 2006. The PNGRB Act provides a legal framework for regulating the refining, processing, storage, transportation, distribution, marketing and sale of petroleum, petroleum products and natural gas, but excluding the activities of production of crude oil and natural gas, so as to protect the interests of consumers and entities engaged in these activities. The main functions of PNGRB include, inter-alia, (a) granting authorizations for laying, building, operating or expanding new pipelines as common carriers or contract carriers and for laying, building, operating or expanding new city gas distribution networks (CGD networks), (b) declaring existing natural gas pipelines, petroleum & petroleum product pipelines and CGD networks as common carriers or contract carriers, (c) regulating access to common carriers or contract carriers (d) regulating transportation rates of common carriers or contract carriers and (e) to perform such other functions as may be entrusted to it by the Central Government to carry out the provisions of this Act.

During the financial year 2017-18, PNGRB has notified various Amendments to Regulations in respect of Natural Gas Pipelines, CGD networks and Petroleum Product Pipelines and has also issued various authorizations, orders, decisions in respect of Natural Gas Pipelines, Petroleum Product Pipelines and CGD networks. The details of the said regulations, amendments, authorizations, orders, and decisions are available on the official web-site of PNGRB (www.pngrb.gov.in) and have varying implications on respective entities business activities. These regulations, amendments, authorizations, orders, decisions of PNGRB are appealable before the PNGRB Bench, Appellate Tribunal and Courts and accordingly, some of them pertaining to your Company are also under various stages of appeals. The timing and content of any final changes in regulations made by the Regulator is not in your Company's control. However, regular anticipation in public consultation exercises conducted by the Regulatory Board and making submissions to the Regulator in writing helps it to anticipate or to minimize its risks associated with any sudden or unforeseen changes in regulations.

➤ **Natural Gas Prices**

Your Company is currently marketing natural gas purchased from domestic and international sources.

The Government of India, vide its order dated October 25, 2014, had notified the New Domestic Natural Gas Pricing Guidelines, 2014. As per the notification w.e.f. November 01, 2014, the gas price is determined bi-annually as per a specific formula, which in essence, is a twelve month average price (minus transportation and treatment charges) of natural gas traded in the major hubs worldwide.

The New Domestic Natural Gas Pricing Guidelines, 2014 are applicable uniformly to all nominated fields to ONGC & OIL, NELP blocks and Pre-NELP blocks that require Government Approval as per PSC, whereas the same are not applicable in case of small and isolated fields of nominated blocks that are covered under the pricing guidelines of 2013.

Further, the Government of India, vide its order dated March 21, 2016, has notified guidelines on marketing including pricing freedom for the gas produced from discoveries in deep water, ultra-deep water and high pressure-high temperature areas. As per the guidelines, the government has decided to ensure freedom of pricing for gas produced in these fields

up to a ceiling price level calculated by taking lower of twelve month average of landed price of imported fuel oil, substitute fuels and LNG.

Your Company earns the marketing margin on the sale of domestic natural gas. Further, the Government of India, in its notification dated December 24, 2015, applicable from November 18, 2015, has put a ceiling on marketing margin for the supply of domestic gas to fertilizer (Urea) and LPG producers to ₹200 per 1000 SCM

In addition to the above, your Company purchases imported natural gas mainly from Petronet LNG Limited (PLL) at Dahej, Gujarat. The purchase and selling prices of such Natural Gas (RLNG) is based on international crude price indices. Further, your Company also directly imports LNG through carriers from various suppliers worldwide and gets it regasified either at PLL's regasification terminal at Dahej, Gujarat or at Ratnagiri Gas and Power Private Limited (RGPP) regasification terminal at Dabhol, Maharashtra.

Such LNG import is either under a medium-term agreement ranging up to three years or under spot cargo purchases. Under medium-term import, the selling price is largely based on the purchase price. However, under spot cargo imports, the selling price is dependent upon the demand and supply scenario and customer affordability. Import of LNG spot cargo is based on a thorough assessment of the affordability & requirement of the end consumers and the availability of LNG in the international markets.

Your Company has been constantly endeavoring to meet the supply-demand gap of natural gas in the country through long-term/medium-term and spot imports of LNG. While current supply deficit is primarily met through medium and spot deals, your Company and its subsidiaries/joint ventures / affiliates till date have executed two long-term LNG contracts in the USA and one long-term LNG contract from Russia to meet the supply-demand gap and enhance capacity utilization of pipeline infrastructure:

- LNG Sale and Purchase Agreement with Sabine Pass Liquefaction LLC for sourcing of 3.50 MMTPA of LNG from Sabine Pass Liquefaction terminal, USA with supplies commenced in end February, 2018.
- Terminal service agreement for booking of 2.30 MMTPA liquefaction capacity in the Cove Point LNG liquefaction terminal, USA with supplies commenced from April, 2018 and Gas sale and Purchase Agreement with WGL Midstream for the commensurate gas quantities.
- LNG Sale and Purchase Agreement with Gazprom for sourcing upto 2.85 MMTPA, i.e. around 10.26 MMSCMD of LNG (primarily from Yamal Liquefaction terminal) with supplies to commence from 2018-19. Your Company has successfully renegotiated LNG contracts with Russia's GMTS (Gazprom) and Australia's MARC (Exxon Mobil) in view of the changing market scenario, as spot / short-term LNG prices had declined substantially amid a supply glut. Through these renegotiations, your Company has managed to renegotiate the timeline, volume, LNG Price and price indexation of these long-term LNG contracts, resulting in significant price advantage.

The aforesaid LNG contracts were entered by your Company with the primary objective of meeting the demand of a growing Indian economy and at the time of finalization of the Sale Purchase Agreement (SPA), the power sector was considered as one of the major long term buyer of LNG in the Indian market. However, power produced from LNG is not being scheduled by Distribution Companies (DISCOMs) due to cheaper alternatives including renewables thereby leading to stranding of significant capacity out of 25,000 MW of the installed gas based power plants.

To mitigate the above risks, your Company is exploring opportunities to market LNG volumes in the international markets either directly and/or through its Singapore based subsidiary, GGSPL. Further, your

Company has already concluded three time swap deals, where-in LNG volumes were purchased from international parties during financial year 2017-18 with an agreement to sell equivalent volumes of HH during FY 2018-19.

In parallel, your Company has also optimized LNG sourced from the US through destination swap transactions which significantly reduces cost of shipping HH LNG to the Indian ports resulting in improved affordability for the Indian customers.

As a result of these transactions, your Company has already tied up / optimized substantial volumes of HH LNG in domestic and international markets for the year 2018. Your Company has also executed agreements for LNG supply to the upcoming/revived Fertilizer units in the domestic market. Efforts are also on to market RLNG to anchor customers like refineries and steel plants along upcoming and existing pipelines.

Since FY 2016-17, your Company undertook hedging transactions for a part of LNG volume used for your Company's internal consumption and sale to domestic and international customers, to mitigate the price risk and fix the margins. Such mitigating measures of commodity hedging are underway based on the regular assessment of managing cash flows from trading transactions.

➤ **Unified/Pooled Tariff for the integrated Natural Gas Pipeline system**

Present methodology of PNGRB requires tariff to be levied separately for each pipeline. However, based on market condition it is seen that consumers across far-flung regions along the pipeline demand tariff prevailing near to the sourcing region so as to manage input costs, or in other words, maintaining competitiveness of their end-products/service. Integration of natural gas pipelines and determination of pooled tariff for such an integrated pipeline system provides an optimal solution to tide over wide variation in tariff structure across regions and the emergence of equitable gas based economic development. Unified/Pooled tariff removes the distortion in the tariffs applicable to the existing and new customers as the pipeline network expands.

To facilitate equitable growth of natural gas markets, the Cabinet Committee of Economic Affairs (CCEA) while according 40% capital grant for the Jagdishpur-Haldia and Bokaro-Dhamra pipeline project, also inter-alia directed MoP&NG to examine your Company's request of devising Unified/Pooled tariff for all its inter-connected cross-country pipelines which shall be applicable uniformly to all customers along the integrated network of GAIL for ensuring financial viability and sustainability of such infrastructure projects. It also empowered MoP&NG to either vest the responsibility of fixing such a tariff by the nodal Ministry itself or by PNGRB through suitable directions based on the parameters of phase-wise actual/anticipated capacity utilization, operating expenses (including unaccounted gas, line loss), future capital costs for last mile connectivity etc. to ensure 12% post-tax return on GAIL's investment.

➤ **Renewables**

Domestic electricity market is undergoing a churn in the manner in which the DISCOMs are purchasing power. Given aggressive bids by solar power developers owing to several influencing factors, there is a growing tilt towards such sources for managing consumer expectations. Plant Load Factor (PLF) for conventional fuels is on a decline and natural gas based power plants continue to run with structural issues requiring resolution through policy intervention. Your Company has been working on case to case basis and in close co-ordination with MoP&NG and Ministry of Power to increase/revive off take of natural gas by the power sector.

➤ **Polymer, LPG and other LHC**

Your Company is also marketing petrochemicals, LPG and other LHC

products. The prices of these products are influenced and determined by global and domestic factors influencing demand, supply and price. Your Company has developed a range of market acceptable products to ensure steady consumption of the petrochemical products and optimizes strength of the portfolio from Pata and Assam facilities. LPG marketing is decided in close co-ordination with the PSU Oil Marketing Companies. Continuous measures are taken towards managing margins across your Company's range of products.

➤ Foreign Exchange Fluctuation Risk

Your Company largely imports capital goods and stores & spares for various new projects, and operation & maintenance. It has also taken loans in foreign currency for meeting the capex requirement and making overseas investments. The majority of loan portfolio is hedged by way of derivative products (currency swap and interest rate swap) and through natural hedge. Your Company has an approved Foreign Currency & Interest Rate Risk Management Policy to manage foreign exchange exposure which has been reviewed during the year. The short-term and long-term exposure of foreign currency of your Company is being monitored as per the approved policy. Your Company has implemented standard functionality of Treasury & Risk Management Module integrated in the SAP platform for efficiently managing forex exposures.

➤ Commodity Price Risk

Your Company also has approved Natural Gas Price Risk Management Policy to manage the price risk of natural gas. The price risk of natural gas used for internal consumptions and as well as for customers is being monitored as per approved Policy. Your Company has undertaken various derivative contracts to hedge the price risk arising out of import of natural gas viz plain vanilla swaps, basis swap etc. Your Company has also undertaken other measures like time swap, destination swap etc to optimize margins in the transactions.

➤ Natural or Man-made Calamity Risk

Various risks are associated with gas transmission and distribution like blowout of pipelines, earthquake, tsunami, terrorist activities, etc.

These risks are being mitigated right from the designing stage of these projects. However, such natural or man-made risks are emergent events and cannot be totally eliminated. If such an event occurs, it will incur significant liabilities for the Company.

➤ Risk Management Framework

Your Company has an approved Risk Management Policy & Procedure to protect and add value to the organization and its stakeholders with the objective to establish a risk intelligence framework for managing objectively expected risk exposures by the decision makers in compliance to prevailing statutory regulations so as to maintain financial stability of your Company.

A robust Risk Management Framework supports your Company's business strategy and operations. Risk Management Framework is constantly updated for new and emerging risks emanating from business expansion and interests. The risks are evaluated, quantified & prioritized and mitigation plans are reviewed & monitored at various stages. Corporate Level Risk Steering Committee oversees the implementation of the Risk Management Policy and Procedures which are periodically reviewed and monitored by the Risk Management Committee and by the Audit Committee before presenting them to the Board.

In the changing business scenario and the expansion of your Company into various other activities, business risk and their mitigation plans are re-assessed on regular basis. Currently, the top key Corporate Level Risks are as under:

- Take or Pay Risk on long term internationally sourced LNG.
- Risk of Reduction in Profitability of Petrochemicals.
- Risk of delay in Project Execution due to delay in obtaining Right of Use (RoU)/Land.
- Risk of Underutilization of pipeline due to low downstream draw and low pipe line capacity trade.
- Risk of Regulatory framework
- Encashment of Corporate guarantee provided to PNGRB on behalf of GAIL Gas Ltd. in connection with the Bengaluru CGD project.

As covered in the preceding paras, identified risks have been deeply examined and reasonable mitigating measures and safeguards have been initiated so as to eliminate or minimize the impact of the identified risks. Your Company endeavors to pro-actively initiate measures towards maintaining financial stability from its business operations.

INVESTOR RELATIONS AND ENGAGEMENT

The objectives of your Company's investor relations activities are to develop a long-term relationship of trust with stakeholders by fulfilling responsibilities not only towards shareholders but also other stakeholders, investors and analysts, through fair process of information disclosure. Your Company maintains open channels of communication as it engages with various stakeholders. In order to pursue these objectives at all times, your Company continuously discloses the necessary information and conducts various investor relations activities.

During FY 2017-18, to pursue the objective of effective communication with investors, your Company has taken following measures:

- i) Organized Investors' & Analysts' Meet 2017
- ii) Organized Conference Call immediately after announcement of the financial results for Q1 2017-18, H1 2017-18 and Q3 2017-18.
- iii) Company participated in 11 domestic investor conferences organized by top brokerage houses of the country.

All these meetings/ conferences were attended by Top Management/Senior Executives from Finance, Marketing, Business Development and Projects in addition to executives from site offices.

As per requirement of SEBI (Prohibition of Insider Trading) Regulations, 2015, Company's Board has approved:

- Code of Conduct to Regulate, Monitor and Report Trading by Insiders (Insider Trading Code) and
- Code of Fair Disclosure and Conduct- Practices and Procedures for Fair Disclosure of Unpublished Price Sensitive Information (Principles of fair Disclosure)

The investor presentation(s) and mentioned guidelines are hosted on the website of your Company and are also informed to Stock Exchanges.

Your Company will continue with its endeavor to provide world-class investor relations services in disseminating information to its investors & analysts at the right time and from the right people. In view of the above, the Investor Zone section of the corporate website has been reviewed and updated for ensuring informative and investor-friendly engagement as your Company adheres to the ethos disseminating accurate information to stakeholders and capital market participants (including shareholders, investors, and securities analysts).

CAPABILITY BUILDING

Your Company realizes the criticality of aligning human resource development initiatives with strategic objectives to achieve organizational goals. Significant steps towards skill development and capability build-up, talent acquisition, development and retention strategies are continuously undertaken for being an employer of choice.

➤ **Human Capital**

Your Company invests dedicated resources in order to be the preferred employer to attract and retain requisite talent. The Company's Intellectual Capital is carefully nurtured and channelized to cater to its business plans for maximizing value. Value Added per Employee reflects its emphasis to make the optimal & productive use of the available resources and business opportunities. For the year under review, Value Added per Employee was ₹ 239.07 lakh.

➤ **Leadership Development Program**

GAIL has undertaken structured Leadership Development Interventions for its senior / middle management levels with a broad focus on developing and enhancing the quality of talent pool of people who are in the wings to take leadership roles and thus build a strong leadership pipeline. Your Company believes that capability building and enhancing competency of employees is the key to successful execution of its strategic plans.

Your Company has adopted an Integrated Leadership Development Approach synchronizing it with other talent processes. The Development strategy comprises Dual Focused Talent Development Interventions viz. (i) 360 Degree Feedback Exercise and (ii) Senior Management Development Centre Exercise. 360 Degree Feedback is aimed to provide an effective feedback to concerned executive (s) (in E5 and above grades) via his/her peers, subordinates, and seniors.

Your Company has also designed a 'Succession Planning Framework' for ensuring smooth transition to identified leadership roles/positions. It is aimed to put in place a structured framework to ensure adequacy of Leadership Pipeline/ talent pool/ skill set availability, both in terms of quantity and quality of potential successors, in line with your Company's business plans. The Successor Development Framework will be used to facilitate development of pool of successors through Individual Development Plans (IDPs) and other developmental interventions.

➤ **Capability Development**

The GAIL Training Institute (GTI) organizes systematic and structured training programs for capability building across all levels within the organization on a continuous basis.

Your Company is also playing a proactive role to support the National Skill Development Mission through active participation in the activities of Hydrocarbon Sector Skill Council (HSSC), establishment of Skill Development Institute at Raibareli and providing Training and Recognition of Prior Learning (RPL) in Pradhanmantri Urja Ganga Pipeline and City Gas Distribution Projects to create a pool of skilled manpower.

➤ **Industrial Relations**

Your Company's Industrial Relations climate remained congenial and constructive. There were no Man Days or Man Hours lost on account of any sort of industrial conflict/unrest.

In the Company's endeavor to meet the ever-changing business requirements and to maintain a sustainable competitive advantage, review of HR strategies and policies is undertaken on a continuous basis to align with the Organizational Strategy.

During the year, review of various HR Policies on Employee Compensation, Welfare, Social Security, Career Progression, etc., was undertaken to position your Company as an Employer of Choice.

HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT

➤ **Corporate HSE Policy**

The HSE Best Practices in your Company are primarily driven through a Corporate HSE Policy which is a statement of commitment of the management of your Company. Your Company is committed to giving the highest priority to Occupational Health, Safety of Plants and Pipelines & Personnel in a serene environment. Uniform, well-designed

HSE Management System is in place to support its commitment. Your Company conducts its business in harmony with nature and promotes sustainable development. Employees and contract workers are encouraged to adopt safe working habits and behavior to ensure an effective implementation of the HSE Policy and are empowered to notify and stop any unsafe work/act, as may so arise.

➤ **Safety Performance**

Safety performance is measured in your Company through the "HSE Score", which is evaluated on the basis of the important HSE Management System elements. Your Company achieved an "HSE Score" of 93.45% as against the MoU target of 90%.

➤ **Safety Training**

Training is a key to the safety of people and premises. Your Company imparts regular and structured HSE training including Behavior Based Safety and Environment, Health & Safety Module (EHSM) software/SAP training to its employees to upgrade their skills, knowledge and competence, in order to perform their HSE functions effectively and develop an effective safety culture. Regular training is also imparted to contract workers, tanker drivers and other personnel to create awareness of the probable hazards in their work area so as to avoid and safeguard against unsafe actions.

➤ **Safety Audits**

Safety audits are regularly conducted to ensure the implementation of the HSE Management System Guidelines and Emergency Preparedness. These audits are performed by both External safety auditors and experienced in-house auditors. Audit recommendations are being complied in a time bound manner.



GAIL organised several events to commemorate the International Day of Yoga. Shri B C Tripathi, CMD (centre) led the Company's employees who participated in the events in large numbers

➤ **Occupational Health**

Your Company has implemented occupational hygiene measures and medical surveillance programs to monitor and control the occupational health of its employees, based on defined guidelines. All employees at various work centers undertake periodic medical examination as per these guidelines. The Corporate Occupational Health Committee meets on a quarterly basis to monitor the occupational health program in your Company and the effectiveness is evaluated based on the outcome of the Health Audit undertaken through in-house multi-disciplinary teams.

➤ **HSE Initiative and Achievements**

Your Company has taken various initiatives to further improve the HSE Management System. Some of the important HSE initiatives and achievements are:

- Taking lead, your Company organized a two-day HSE Conference and Exhibition. The theme was "Shaping HSE Culture Amidst Global Challenges". Diverse range of topics related to HSE Management were covered during the Conference. The event included participation of 46 eminent National and International speakers and Panelists.
- Improved new In-House Incident reporting System developed and implemented across the Company.
- Your Company has also initiated the practice of sharing Process-related initiatives and lessons learnt with all employees, through GAIL Intranet.
- Your Company officials presented various technical papers on HSE subjects at various National and International forums.
- Various installations of your Company got safety awards from M/s National Safety Council, Mumbai and M/s British Safety Council, U.K

SUSTAINABILITY INITIATIVES

This year your Company will be publishing its eighth Sustainability Report – 'Execution, Efficiency, Excellence' for FY 17-18 based on the Global Reporting Initiative (GRI) G4 Standards. Sustainability reporting has helped in measuring and monitoring your Company's performance and moving beyond the mandatory requirements to ingrain a sustainability culture within the organization. The initiative has served as an important management tool, helping us to revisit its systems, policies and procedures.

Your Company's Sustainable Development Committee, comprising of Functional Directors and Independent Directors, regularly monitors performance under sustainability initiatives. This year, all sites took up Annual Sustainability Work Plan to undertake sustainability projects in a phased manner. Petrochemical plants are also working on energy efficiency benchmarks in collaboration with Bureau of Energy Efficiency to set standards of carbon emissions and specific energy consumption with the Petrochemical sector becoming part of the PAT scheme (Perform, Achieve & Trade). Further, Your Company is also in the process of revisiting its long-term Sustainability goals to better align with its change in business and Global & National priorities.

Taking a step forward in its Sustainability journey, GAIL has also developed its Sustainability Charter with aim which will serve as the guiding force to your Company's future objectives, actions and aspirations. The Charter follows an integrated approach for embedding environmental and social concerns into the corporate DNA while establishing a leadership platform towards sustainability and climate action.

Your Company believes that it is important to collaborate with industry leaders, associations and peers to address national and global sustainability challenges and work towards a common goal. Your Company has collaborated in the study on "Climate Change Risks: Preparedness for Oil and Gas Sector" undertaken by the Federation of Indian Petroleum Industry (FIPI) and The Energy and Resources Institute (TERI).

In line with the SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015, Business Responsibility Report (BRR) 2017-18 is contained in a separate section of the Annual Report.

INNOVATION, RESEARCH AND DEVELOPMENT (R&D)

Innovation and R&D are vital to leveraging the new business opportunities for providing sustainable business proposition for GAIL. In this direction, your Company is pursuing various R&D projects in collaboration with renowned scientists across various IITs and CSIR labs to improve the efficiency and safety of its process operations, develop new application for its products, and to develop technologies for low-carbon energy future. Various developmental works are carried out at its operational facilities for process optimization, hazard reduction, mitigating environmental impact and productivity

improvement etc. Your Company is consistently allocating a budget of 1% of PAT towards R&D. The R&D efforts have led to various novel developments and 8 Patent applications were filed during the year. The important Research themes pursued in FY 2017-18 include work on Bio-based fuels & clean energy development, Pipeline Integrity Management and CO₂ utilization.

Under the bio-based fuels, an eco-friendly and energy-efficient process for bio-ethanol production from agricultural residues is being developed. Under clean energy research, a low emission natural gas combustor as a hybrid heating source for supercritical CO₂ Brayton cycle is being developed. Lab-scale studies on methane production from marine gas hydrates are being carried out to augment the availability of natural gas. Your Company has participated in gas hydrate scientific drilling investigation under the National Gas Hydrate Program (NGHP). Your Company is also setting up a 1 TPD demonstration Pilot plant for conversion of waste plastic to diesel to validate the successful work carried out earlier at bench-scale.

In Pipeline Integrity Management, remote monitoring of Pipeline RoU through high resolution satellite images was continued through the GAIL Bhuvan portal which was launched last year. In addition, the pilot testing of Wireless Sensor Network based Data transfer is being continued at select terminals.

CO₂ is a Green House Gas and GAIL R&D is continuously focusing on initiatives for its conversion/utilization. The efforts include Microbial fixation of CO₂ for biomass production, and the development of novel catalysts for tri-reforming of CO₂ and Methane to syngas.

Your Company has a long-established Suggestion Scheme to elicit innovative ideas from employees to improve business processes. This scheme promotes innovation and creativity in the organization. The proposals are evaluated by a technical committee for feasibility and implementation. The best proposal is awarded with the CMD trophy. In addition, lot of innovations are also carried out through Quality Circles.

TOTAL QUALITY MANAGEMENT

Your Company is committed to enhance customer satisfaction and standardizing business processes through the implementation of a Quality Management System. Your Company endeavors for continual and sustainable improvement through the implementation of effective quality practices, innovation and standardization. Quality Management System and Energy Management System, along various pipelines & process units, at corporate and marketing offices, have been implemented. Your Company undertakes Quality Circle projects with engagement of its employees, resulting in high employee morale and increased productivity.

ENVIRONMENT PROTECTION AND CONSERVATION/ RENEWABLE ENERGY DEVELOPMENTS/ FOREIGN EXCHANGE CONSERVATION

Your Company, since inception, is in the core business of Natural Gas, an environmentally benign fuel. It has helped the Power sector, the fertilizer sector and many others to produce clean power and clean fertilizers amongst other products. Your Company has kept environment sustainability at the core of all diversification and expansion projects during its growth journey. The Liquid hydrocarbon business, the City Gas Distribution in many important cities of the country has been instrumental in changing the air quality in homes and cities. At our own installations, ecological paradises have been created at most locations with wide biodiversity and water bodies. The Natural Gas and LPG pipelines that your Company operates have contributed to the cause of environment to a considerable extent by reducing tanker traffic on roads, thus creating a better environment and promoting higher standards of safety.

In line with the Company's Vision to create value for all stakeholders and fulfill its environmental responsibility, your Company has taken various initiatives and business decisions over the years to ensure its businesses and operations have maximum impact on the economy and its stakeholders. Due to its environmental advantages and greater efficiency, gas is expected to play a larger role in the Indian energy mix.

India's move to promote gas usage is in line with the commitment made at the Paris meeting on climate change at COP 21, which aims to reduce the country's carbon emission intensity by up to 35% from 2005 levels by 2030 and producing 40% of the power from non-fossil fuel sources by 2030. Natural gas is a good fit for decarbonizing India's energy system, as it plays a dual role in both replacing carbon-intensive fuels and facilitating the development of renewable power.

The increasing use of gas in non-power sectors will allow to reduce CO₂ emissions and improve air quality as gas will replace (or complement) higher-emitting oil products: fuel oil/naphtha and pet coke in the industrial sector, diesel in transportation and traditional biomass, and LPG and kerosene in the residential/commercial sectors.

Considering the life cycle impact on environment and health natural gas is much more benign fossil fuel when compared to coal and liquid fuel. Being a clean fuel, it does not require huge amount of water for its purification and it does not contaminate the ground water. Further, it is either transported through pipeline as gas or closed cryogenic vessel as liquid and therefore does not contaminate air during transportation. Difference between the emission level of pollutant & greenhouse gas from entire life cycle of Coal & Gas based power plant is huge and also gas based power plant has significant advantage over coal based plant.

Substituting road transportation of LPG - With laying of exclusive pipelines for LPG transmission in various parts of the country, GAIL has contributed to replace the mode of transportation by road required to deliver LPG from production facilities to various customers, which is less emission intensive.

Reducing GHG emissions from flaring - India's exploration and production activities involved flaring of natural gas that could not be utilized until the 1980s due to technological and economic feasibility. With commencement of GAIL's operations and growth over the years, GAIL has significantly contributed towards reducing flaring of gas from exploration and production activities.

Your Company considers water as a precious natural resource and hence its consumption is closely monitored and controlled. State-of-the-art technologies have been adopted to reduce and treat the wastewater generation. Your Company maximizes the concept of reuse and recycle of water. Discharge at all locations is compliant to the norms of the respective State Pollution Control Boards.

Your Company's operations at all locations are state-of-the-art and involve clean technologies. Adequate treatment and reuse of treated waste waters is adopted across the Company. Treated effluent water is recycled and used in-house for horticulture purposes within plant and township premises.

Your Company uses one of the cleanest fuels available, i.e., Sulphur-free natural gas at the process plants. Since your Company uses natural gas for its feedstock as well as fuel requirements, the level of pollutants is consistently maintained much below the national stipulated norms. Adequate stack height has been provided for effective dispersion of pollutants. Low NO_x burners are used in all the furnaces. Loading facilities are provided with vapor-return circuits. Gas detectors have been installed to ensure quick detection of any gas leak.

Your petrochemical complex at Pata has the facility of monitoring stack air and ambient air on continuous basis. State-of-the-art permanent Ambient Air monitoring stations measure sulphur dioxide, oxides of nitrogen, hydrocarbons, carbon monoxide and noise levels on real time basis.

Your Company manages its waste by efficiently segregating, treating and disposing based on the type of waste generated i.e. hazardous and non-hazardous.

All installations of your Company carry out extensive afforestation in their respective sites and maintain at least one-third of the area as green belt. Your Company has been continuously taking initiatives to safeguard the environment and biodiversity along with its diverse business segment. Your

Company understands the value of the green spaces present within its premises, and desires to feature the unique aspects of the flora and fauna to the general audience. A coffee table book on Biodiversity is being published on the Company's Biodiversity assessment, having details of rich flora and fauna at your Company's installations.

Your Company monitors environmental parameters to assess the environmental quality on regular basis through an in-house team and as well as by independent third-party agencies. Updated and sophisticated instruments are used for monitoring environmental quality. The monitoring is done regularly and reports are sent to the respective State Pollution Control Boards. The water and waste water samples are also analyzed at the in-house laboratory as well as external laboratories on a regular basis. Audit is also conducted for the process plants and pipelines to ensure proper functioning of the environment management.

In addition to our 118 MW of Wind Energy Generation Projects (WEG) and 5 MW of Solar Energy Projects, as part of our commitment towards sustainable development, your Company has installed India's second largest solar PV rooftop of 5.76 MWp at its petrochemical complex at Pata, U.P. The power generated is being consumed within the petrochemical complex and substitute power is being drawn from the grid. This arrangement is significant in cost reduction and also reducing the carbon footprint of GAIL.

CORPORATE SOCIAL RESPONSIBILITY

In alignment with the vision of your Company, the CSR initiatives strive to enhance value creation in the society/community in which it operates, through its services, conduct and initiatives, and to promote sustained growth in social well-being. In the year 2017-18, your Company has proactively incurred an enhanced expenditure of 2.63% of the average net profit of the preceding three financial years on CSR projects/activities. The Annual Report on CSR activities as per requirement of the Companies Act, 2013, forms part of the Directors' Report.

Your Company has adopted Taj Mahal, Agra under the "Swachh Iconic Place" (SIP) initiative of the Government of India which is inspired by the vision of Hon'ble Prime Minister to promote and enhance cleanliness across the top 10 heritage and iconic sites in the country. 'Swachh Iconic Places' which is a special initiative under Swachh Bharat Abhiyan, focuses on select iconic heritage, spiritual and cultural places in India. Your Company, in partnership with the district administration and Agra Nagar Nigam, is supporting various initiatives like municipal solid waste management, street sweeping, Horticulture, landscape pruning, maintenance & removal of horticulture waste, fountains in parks, operation and maintenance of Water Vending machine for improving cleanliness around the Taj Mahal. Your Company has also adopted Yamunotri Dham, Uttarkashi, under its CSR initiatives. At Yamunotri, your Company has supported establishment of Local Wireless Internet Network including IP-based Electronic Surveillance system with PTZ camera and monitoring Hardware/Software etc. with components focusing on safety and security of pilgrims during yatra. Besides, other components are underway for the overall development of the Yamunotri shrine.

INTERNAL CONTROL SYSTEMS & THEIR ADEQUACY

Your Company has a well-established and efficient Internal Control System in place. It has a clearly defined organizational structure, manuals and operating procedures for its business units and service entities to ensure orderly, ethical and efficient conduct of its business.

The Company's internal control system ensures efficiency, reliability, completeness of accounting records and timely preparation of reliable financial and management information. Internal financial controls framework and Risk Control Matrix (RCM) for various business processes is in place and reviewed continuously. In addition, it also ensures compliances of all applicable laws and regulations, optimum utilization and protection of the Company's assets.



GAIL participated in the Swachh Bharat Fortnight through cleanliness and awareness drives near the Company's work centres across the country. Directors, senior executives and employees of the Company took a cleanliness pledge at one of the events organised in New Delhi (above)

Your Company has an independent, in-house Internal Audit department, consisting of professionally qualified persons from the accounting, engineering and IT domains. The Internal Audit department functionally reports to the Audit Committee and administratively reports to the Chairman & Managing Director. This reporting is considered as the best global practice. Internal Audit, through risk-focused audits, audit the organization's risk management, the business processes and internal controls. The audit assignments are conducted as per the annual audit program approved by the Audit Committee. The Audit Committee of the Board regularly reviews significant findings of the Internal Audit department and the CAG audit.

LAURELS

➤ Corporate

- GAIL was amongst the finalists of S&P Global Platts-Global Energy Award in the "Industry Leadership Award – Midstream" Category.
- GAIL reached the final stage of "BML Munjal Awards-Business Excellence through Learning and Development".

➤ CSR

- "CSR Project of the Year Award" for Srijan-by India CSR Network
- "Social Footprints CSR Award 2018"- by CIM Global & CMAI Association of India

- "The Golden Globe Tigers Award 2018 For Excellence & Leadership"-Fun&JoyatWork
- "2nd ICSI CSR Excellence Award – 2017 for Best Corporate (in Large Companies Category)"-by ICSI
- "FICCI CSR Awards 2016-17 for Category 2: Education, Skill Development and Livelihood under Public Sector Companies (PSUs)"for Project Avant-by FICCI
- "Economic Times 2 Good CSR Rating"- the only PSU to be feted in 'All Round Excellence' category-by Economic Times.

➤ HSE

- GAIL was conferred with two National Safety Council of India Awards for the year 2016 for two different categories
- GAIL HVJ compressor station, Vijapur declared winner of the second level award - SHRESHTHA SURAKSHA PURUSKAR (Silver Trophy) in the "manufacturing sector category"
- GAIL GPU & Compressor Station, Vaghodia declared winner of the fourth level award (PRASHANSA PATRA) in the same above category.
- GPU Vaghodia & Gandhar won the British Safety Council "International Safety Award-2018".
- GAIL was conferred the Award for "Best Implementation of BBS in Indian Industry" by the Forum of Behavioral Safety, Mumbai.

➤ TQM

- GAIL was conferred with "Best Overall Performance Award for Upstream Sector Company" by PCRA/MoP&NG for Saksham activities.

CAUTIONARY STATEMENT

Statements in the Directors' Report and Management Discussion & Analysis, describing the Company's objectives, strategies, projections and estimates, expectations, etc. may be "forward looking statements" and progressive within the meaning of the applicable laws and regulations. Forward looking statements contained herein are subject to certain risks and uncertainties and accordingly actual results may differ materially from the expectations. Critical factors that could influence the Company's operations include global and domestic demand and supply conditions, changes in Government regulations/tax laws, economic developments within the country and factors such as litigation and industrial relations. Readers are cautioned not to place undue conviction on the forward looking statements.