Management’s Discussion & Analysis

The Company is fast transforming itself from being India’s flagship national oil company to being India’s foremost holistic energy solutions provider. During the year, the Company set a target of increasing its share in the Indian Energy Basket from 1/11th presently to 1/8th by 2040. A massive scale-up in the Company’s operations, reach and spread has thus been envisaged, in line with its vision of being ‘The Energy of India’. The Company envisions maintaining its leadership position in downstream oil, while sizably expanding its business portfolio for ‘Crafting a Green Future’ by scaling its share and building a stronghold in the fast-growing alternate energy and natural gas sectors in India. To orient itself with the nation’s CDP26 commitment, the Company is making significant strides in ‘Crafting a Green Future’ by expanding its business portfolio for ‘sustainable and affordable energy solutions for tomorrow’. During the year, the company fructified its commitment to achieve Net-Zero (operational emissions) by 2046. The Company is working tirelessly to make its conventional product offerings greener and reduce its carbon footprints while also swiftly foraying in a big way in alternate energy solutions.

Fuelled by the mission to ‘Propel the Nation’ and the zeal of being ‘On Duty Always’, the Company has embraced its 5th Value of ‘Passion & Trust’. These values will be the guiding light for the Company’s actions and plans.

GLOBAL ECONOMY

The tumultuous year saw global inflation rates flaring to record high, driven by multiple drivers, including commodity price increases, aggravated by the Russia - Ukraine war, supply chain bottlenecks and strong policy-supported resurgence in demand from the lows of the pandemic. Global inflation increased to 8.8% in 2022 (annual average) from the pre-pandemic (2017-19) levels of about 3.5%. To contain the surging inflation, globally central banks tightened the monetary policy and raised interest rates at a pace not seen in the last 50 years, resulting in increased cost of borrowing globally. During the year, global economic growth slipped to 3.4% from 6.3% in 2021. Erosion in household purchasing power due to high inflation, coupled with supply uncertainty (especially in the context of energy supplies) weighed on demand in many economies and was compounded by high borrowing costs and weakening of currencies of many developing economies. In China, the Covid surge and the Zero Covid policy, along with the ongoing stress in the property sector, restrained economic activity, dipping growth to its lowest in the last 40 years (barring 2020).

INDIAN ECONOMY

During the year, India overtook the UK to become the fifth largest economy in the world. Indian economy posted a strong growth of 7.2% in 2022-23, albeit slower than 9.1% posted in 2021-22, nevertheless standing out as the 2nd fastest growing large economy, second only to Saudi Arabia. In a year marked by record high oil prices and heightened economic woes for many developing economy oil importers, strong growth by India – the world’s 3rd biggest oil importer, stands as a testament to the Indian economy’s innate strengths.

In the first quarter of 2023, consumer price inflation had come off from its peaks in most economies due to the softening in energy and commodity prices and easing of supply chain bottlenecks. Central banks shifted towards smaller hikes, and many indicated a pause in rate hikes. The reopening of the Chinese economy towards the end of 2022 helped it to turn around and is expected to have a positive impact on global activity. On the other hand, recent events in the global banking sector pointed towards the stress, especially in the small & regional US banks and associated fears of a global contagion. Overall, global economic growth is expected to slip further to 2.8% in 2023 from the impact of global monetary tightening and the prevailing high interest rates. Moreover, inflation though softened, remains sticky and above the central banks’ comfort targets for most economies, hence there is a lurking risk of financial vulnerability.

7.2% India GDP growth
In the backdrop of high global commodity prices, India too faced high inflation rates during the year, with retail inflation averaging at 6.65% during 2022-23, exceeding the RBI’s targeted range of 2%-6%. To control the runaway inflation, the Reserve Bank of India(RBI) implemented an aggregate 250 bps hike through its rate hike cycle that began in May 2022, pushing borrowing costs back to 2019 levels. The Rupee depreciated by 7.3% during 2022-23 on account of continued strengthening of the US Dollar internationally, foreign portfolio capital outflows, and rising import bill, driven by high commodity prices. However, the Rupee performed far better than its peers, supported by the RBI’s foreign exchange interventions, increased interest rates, and continued FDI inflows. The country’s large holding of foreign exchange reserves built judiciously over the years and especially ramped up during the pandemic years provided an adequate buffer against global spillovers.

Looking ahead, in 2023-24, growth is expected to be moderate on account of slowing global growth, geopolitical tensions, financial market volatility and tightening global financial conditions. Nevertheless, India is set to be the fastest growing large economy backed by sound macro management, the Government’s focus on capital expenditure and an overall rebound in consumption. The criticality of continued investments in oil and gas to ensure an orderly transition came to the fore. Nevertheless, the events of the year hastened the policy push towards energy transition and marked the beginning of a ‘great industrial scale-up’ in clean energy. In this regard, the International Energy Agency (IEA 2023) noted that major economies are acting to combine their climate, energy security and industrial policies into broader strategies for their economies, with most notable responses being the US Inflation Reduction Act (IRA), RepowerEU, and India’s Production-Linked Incentive (PLI) scheme in green energy areas.

**Oil Market**

After a sharp rise in the first half of 2022, global oil prices fell in the second half of 2022 and the downwards trajectory continued in the first quarter of 2023 as well. The workings of the global oil markets were complicated by a multiplicity of factors, which rendered the market to record price volatility, second only to levels observed during the 2008 financial crisis. The supply concerns mired the market first, followed by high interest rates, fears of recession and China’s Covid-containment measures that pulled prices down later. Alongside this, historic draw-downs in government strategic oil inventories by the IEA members also helped ebb the surging market. In 2023, while reopening of the Chinese economy acted as a booster, the troubles in the global banking sector and the ensuing financial market stress weighed on the prices.

**GLOBAL ENERGY SECTOR**

It has been a turbulent year for the global energy sector, marked by high geo-political uncertainty, redrawing of energy trade routes and high and volatile energy prices. In addition to immediate emergency measures to address the crisis, which meant looking for new suppliers and subsidies for consumers hit by high prices, the crisis also marked long term policy shifts in many cases. Energy security was clearly back in focus as a concomitant goal, along with energy transition, with the thrust on diversity of supplies and domestic production. The criticality of continued investments in oil and gas to ensure an orderly transition came to the fore. Nevertheless, the events of the year hastened the policy push towards energy transition and marked the beginning of a ‘great industrial scale-up’ in clean energy. In this regard, the International Energy Agency (IEA 2023) noted that major economies are acting to combine their climate, energy security and industrial policies into broader strategies for their economies, with most notable responses being the US Inflation Reduction Act (IRA), RepowerEU, and India’s Production-Linked Incentive (PLI) scheme in green energy areas.

**Gas Market**

The natural gas markets witnessed unprecedented turmoil in 2022. Europe’s efforts to meet its gas demand through LNG as its main alternative destabilized the global LNG market and trade, resulting in diversion of flows, soaring of spot LNG prices, and LNG demand destruction among Asian importers. Europe’s high dependence on piped natural gas imports from Russia pushed global gas markets into a crisis, with global gas prices hitting record highs. Sanctions and counter-sanctions between the EU & Russia and later curtailment of gas flows to Europe left Europe scrambling for supplies following the soaring prices across markets. European gas prices (Dutch TTF) in late August hit record highs of over $900/mmbtu on continued uncertainty about Russian supplies and worries about meeting winter demand. With a robust build-up in European gas inventories (above the previous 5-year average), reduced natural gas consumption in Europe, milder winters and incoming LNG flows, natural gas prices fell across markets in the latter half of 2022 and well into 2023. Overall, global natural gas consumption fell by 2% in 2022; marking the fifth annual reduction since 1965. The decline was largely on account of reduction in European consumption, which was 8% below the 2015-2019 average. In 2022, LNG trade grew by 5%, demand in Europe rose by a striking 63% while in the Asia-Pacific region LNG demand fell by 8% due to record high spot LNG prices. Russia’s piped gas exports to Europe in 2022 fell by 50%, the lowest since mid-1980s. While Russian natural gas production fell sharply, global natural gas supplies remained stable as supplies from elsewhere helped offset the decline. In particular, natural gas production in the US hit record levels in 2022, driven by high prices and high LNG export demand, which was serviced through new liquefaction capacity additions.

**Upstream Investments**

Structural underinvestment in hydrocarbons has been under way since the middle of the last decade in the context of low energy prices and rising investor focus on ESG (specifically carbon). Threats to energy security faced during the year brought the focus back on upstream investments, which hit an eight-year high and posted the largest year-on-year increase in history. According to the International Energy Forum (IEF) & S&P Global Commodities, upstream investment will need to rise even further to stave off a global oil supply shortfall this decade. A cumulative investment of US$ 4.9 trillion between 2023 and 2030 would be required to meet oil market needs, even if demand growth plateaued.

**Low Carbon Energy**

Global renewable energy capacity rose by 9.6% in 2022 (IRENA), of which solar and wind accounted for 90% of the net additions, and almost half of the new capacity was added in Asia. The additions lifted total renewable energy capacity to 3,372 gigawatts (GW) at the end of 2022, which was 286 GW higher than the previous year. Investment in clean energy hit a record US$ 1.7 trillion in 2022. According to the IEA, the ratio of clean energy to fossil energy investment which was 1:1 just five years ago has been rising, touching 17:1 in 2022.
The events of the past year made it clear that a pragmatic focus on decarbonization and energy security would be crucial in sustaining the energy transition. Many mega policies and plans were launched such as the IRA (US 2022), RepowerEU (EU 2022), the Green Transformation (GIX) programme (Japan, 2022), which not only focused on solar, wind and battery technologies but also on clean hydrogen, CCUS, nuclear and low emission gases in a big way.

**INDIAN ENERGY SECTOR**

As the Indian economy normalized, emerging from the shadows of the pandemic, its energy demand surged, growing by 5.6%. The upsurge in economic and industrial activity lifted power consumption by 9.5% year-on-year in 2022-23, more than double the pace of the Asia Pacific region. India added over 15 GW of renewable energy capacity in 2022-23 (of which 12.8 GW was solar) taking the total of non-fossil power generation capacity to 175 GW by the end of 2023-23.

The year was rocked by high and volatile energy prices, especially those of oil and gas. While consumers were protected from high oil prices to a large extent, in case of natural gas, LNG imports took a hit. Oil consumption grew by 10.2% year-on-year and also surpassed the pre-pandemic levels of 2019-20 by 8MMT. Natural gas consumption, which grew by 5.4% year-on-year and was at its lowest in the last five years. While domestic gas production at 33.7 BCM was the highest since 2014-15, LNG imports fell by 13%, the lowest since 2017-18 as LNG spot prices hit unprecedented highs.

The Government of India’s pragmatic stance on importing Russian oil not only helped India import Russian crude oil at competitive prices but also helped India diversify its crude oil sourcing. Russian oil imports to India increased manifold in 2022-23 compared to the previous years and in April 2023, Russian oil imports touched a record high, exceeding the combined flows from Saudi Arabia and Iraq. Russia is the third biggest oil producer in the world and prior to February 2022, 50% of crude oil exports from Russia were destined for Europe, while India was home to less than 2% of crude oil exports from Russia. By offering a market to Russian oil flows, India significantly contributed to the larger energy security played out, in the long-term India’s energy needs will have to be met through a holistic energy basket, where all energy forms co-exist. Megatrends underpinning this are an expanding economy, a rising population, urbanization, industrialization, an emerging middle class, and a young population in contrast to ageing societies of advanced economies. Moreover, in India there is also a pressing need to bridge the energy access deficit. Despite being the third largest energy consumer in the world, its per capita energy consumption levels continue to be strikingly low. At 0.6 toe (tonnes of oil equivalent) per person, India stands not only well below the world average of 1.8 toe per person, but also below the non-OECD average of 1.3 toe per person-pointing towards a conspicuous energy access deficit. On the supply front, India is currently highly dependent on imported energy supplies and this dependence is expected to rise, at least in the medium term. The recent energy crisis has brought energy security back into focus with the need for energy transition to be grounded in energy security. Ensuring ‘energy access & affordability’ and ‘energy security’ are, therefore, the other two clear priorities for India.

**LONG TERM ENERGY TRANSITION OUTLOOK**

The energy sector globally and in India is witnessing a slow, yet profound shift towards low carbon energy forms. Today, majority of the countries have taken up Net-Zero Commitments, and India too made its historic announcement of reaching Net-Zero emissions by 2070 to COP26. While a pervasive global phenomenon, energy transition pathways and the speed of transition will be unique for every country, depending on the context of their stage of economic development, demographics, resource base, among other factors.

Over the long term, global energy demand is expected to remain almost unchanged at current levels, with energy demand estimated to have already peaked in the OECD countries. The declining share for all hydrocarbons, especially coal, rapid expansion in renewables in both absolute and relative terms, increasing electrification of final energy consumption, are seen as the vital trends underpinning the long-term energy transition outlook globally. While the scale-up in renewables and increased electrification of final energy consumption are expected to be substantial across all scenarios, the scale of decline in share of hydrocarbons over the long term is seen to vary in a wide range across scenarios, especially for natural gas and oil, to some extent.

India has set itself a target to achieve Net-Zero emissions by 2070 and thereby reaffirmed India’s energy sector’s sustainability approach. Over the long term, India’s energy demand is expected to grow robustly at a median rate of 2.4% p.a. up to 2050. Megatrends underpinning this are an expanding economy, a rising population, urbanization, industrialization, an emerging middle class, and a young population in contrast to ageing societies of advanced economies. Moreover, in India there is also a pressing need to bridge the energy access deficit. Despite being the third largest energy consumer in the world, its per capita energy consumption levels continue to be strikingly low. At 0.6 toe (tonnes of oil equivalent) per person, India stands not only well below the world average of 1.8 toe per person, but also below the non-OECD average of 1.3 toe per person-pointing towards a conspicuous energy access deficit. On the supply front, India is currently highly dependent on imported energy supplies and this dependence is expected to rise, at least in the medium term. The recent energy crisis has brought energy security back into focus with the need for energy transition to be grounded in energy security. Ensuring ‘energy access & affordability’ and ‘energy security’ are, therefore, the other two clear priorities for India.

*Median Forecast (IEA & BP)"
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In contrast to the accepted global prognosis of the declining share of hydrocarbons globally over the long term, in India, we would see energy transition progress on a different path. Wherein, the role of natural gas in India's energy mix is set to enhance substantially and India sees natural gas to be crucial to its decarbonization strategy. Massive investments in the building of natural gas infrastructure are underway in the country. India's oil demand is set to grow robustly in this decade from around 5 MBPD currently to over 7 MBPD by 2030 and further may reach 9 MBPD by 2040, driven by rising per capita income, growing demand for personal vehicles, air travel, urbanization and shifting income pyramid. Given the fact that India's incremental demand will be the highest in the world between the period till 2040, the path to Energy transition will need to be calibrated and pragmatic to strike the balance between energy affordability, accessibility, security, and justice on one hand and the other addressing sustainability & climate change. While increasing penetration of EVs and alternatives may affect gasoline energy affordability, accessibility, security, and justice on one hand, and the other addressing sustainability & climate change. Wherein, the role of natural gas in India's energy mix is set to enhance substantially and India sees natural gas to be crucial to its decarbonization strategy. Massive investments in the building of natural gas infrastructure are underway in the country. India's oil demand is set to grow robustly in this decade from around 5 MBPD currently to over 7 MBPD by 2030 and further may reach 9 MBPD by 2040, driven by rising per capita income, growing demand for personal vehicles, air travel, urbanization and shifting income pyramid.

Energy Access  
Per capita energy consumption 0.6/1.8 toe (India/global avg.)

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Improved Standard of Living & Urbanization  
Car ownership per thousand 22/135 (India/global avg).  
Air transport passengers carried per thousand person 60/289 (India/global avg).

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Economic Development  
Growth in Road freight Petrochemicals growth story

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The ongoing energy transition would also entail changes in the refinery product demands, with the importance of some products growing, while others reduce their share. In this regard, the Company's refineries are equipped with the flexibility to have swing capabilities from one product to another. For instance, our refineries are fully equipped to reduce HSD production and increase ATF production. Further, the Company is fully equipped with the flexibility to have swing capabilities from one product to another. For instance, our refineries are fully equipped to reduce HSD production and increase ATF production. Further, the Company is fully equipped with the flexibility to have swing capabilities from one product to another. For instance, our refineries are fully equipped to reduce HSD production and increase ATF production.

The Company stands fully committed to the principle of sustainability and aims to make its existing refinery operations and future expanded operations Net-Zero by 2046 and has adopted a multi-pronged approach to achieve the same by focusing on low carbon/ renewable fuels such as natural gas, renewable power, DGR and green hydrogen along with the focus on increasing furnace and boiler efficiencies.

The R&D Division of the Company has over the years developed many indigenous refining technologies, which have been successfully adopted by its refineries, for instance indiDiesel (DieselHydrotreatment) Technology, indiex (Hexane Hydrogenation Technology), INDAdeptG Technology for the production of low-sulfur gasoline, indiet (Acid Refining) Technology for ATF production by selective removal of mercaptan sulfur, INDOMAX Technology for converting heavy distillate residue into LPG/ light distillate products and many more such technologies. Another area of opportunity in this regard is that of developing indigenous catalyst used in the refinery processes, which are invariably imported.

The Company is adapting to the evolving customer needs using a practice of bringing in the 'Innovate in-house catalysts, which can go a long way in improving profitability and reducing operating costs.

Pipelines

The Company has a sprawling oil and gas pipelines network, which is more than 12,000 km in length. At present, the share of pipeline in the Company's Petroleum, Oil, and Lubricants (POL) transportation stands at 64%. The low emissions profile of pipeline operations, along with the reduced land footprint and the best fit in the context of sustainable operations and value creation. The Company plans to raise the share of pipelines in its modal mix to 80% by 2031-32, in line with what is currently seen in many developed economies. The Company is working on the expansion of its pipeline network, which includes projects lined up to link its 11 Group refineries through pipelines to enhance the productivity of its refineries. In this regard, the Company's New Mundra Paripat Crude Oil Pipeline is a transformational project with a budget over ₹ 9,000 Crore, aims to meet the increasing crude oil demand of the Paripat refinery upon its expansion to 25 MTMTPA. The Company has been adapting to the evolving customer expectations by investing in modernization and automation of its retail outlets and loyalty-based offerings to deliver superior user experience and enhance brand loyalty. Digital initiatives and customer centricity have been most in vogue in the past few years and the Company is focusing on making analytics-based decisions at each step of the customer journey.

The Company envisages transforming its 36,000 plus and growing retail network to complete energy solutions outlets. It is supplying E10 Petrol and has begun supplying E20 petrol at many of its retail outlets. At present, the Company is dispensing E20 petrol from 127 outlets and developing another 250 outlets to increase E20 petrol availability across its network. The Company is in full readiness to meet the stipulated timelines for the nationwide E20 Petrol rollout. It is setting up LNG fuel stations along the Golden Quadrilateral and recently commissioned the first of these at Sepemumbud, Tamil Nadu. With more than 5,400 EV charging stations at present, the Company plans to expand its reach to about a third of its network during 2023-24. Besides, it is also focusing on the novel battery swapping model with a steady rise of this facility at its retail outlets, which promises a quick turnover, given the huge base of two & three-wheeler in the country.

Beyond the domestic market, the Company has been catering to markets in the neighbourhood and has been establishing tie-ups. Over the years, it has_ten markets around the world, in every continent and plans to foray into new markets in future. The Company envisages transforming its 36,000 plus and growing retail network to complete energy solutions outlets. It is supplying E10 Petrol and has begun supplying E20 petrol at many of its retail outlets. At present, the Company is dispensing E20 petrol from 127 outlets and developing another 250 outlets to increase E20 petrol availability across its network. The Company is in full readiness to meet the stipulated timelines for the nationwide E20 Petrol rollout. It is setting up LNG fuel stations along the Golden Quadrilateral and recently commissioned the first of these at Sepemumbud, Tamil Nadu. With more than 5,400 EV charging stations at present, the Company plans to expand its reach to about a third of its network during 2023-24. Besides, it is also focusing on the novel battery swapping model with a steady rise of this facility at its retail outlets, which promises a quick turnover, given the huge base of two & three-wheeler in the country.

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The Company has, over the years, built a sizeable portfolio of E&P assets consisting of 18 domestic and 11 overseas blocks. The production is significantly up from a mere 580 mmtpa of oil in 2004 to over 4 MMtpa of oil equivalent, which is 5% of the crude requirement of the refineries. The Company targets to increase its upstream integration ratio from 5% at present to 10% by 2030 (~11 MMtpa), primarily through investment in domestic assets, while also tapping suitable overseas opportunities, especially in producing oil & gas blocks.

Petroleumchems
India’s per capita petrol consumption currently stands at 12 km, which is significantly lower than the world average (60 km), and China (82 km) and the US (93 km). This disparity presents a substantial opportunity for expansion and scaling within the sector, that will expand further with the rising GDP.

The petrochemicals are known to have strong synergies with the core refining business and this has significantly contributed to the bottom-line of the Company. In the context of the ongoing energy transition, the significance of integrating downstream into petrochemicals becomes even more pronounced. By integrating into petrochemicals, the Company plans to effectively capture both volume and value growth opportunities, while also optimizing refinery utilization during periods of reduced fuel demand. This strategic integration enables a comprehensive approach to leverage the potential benefits of the petrochemical sector in terms of growth and overall refinery performance.

The Company, therefore, is clear that all refinery expansions will have a strong petrochemicals integration with the dual objective of value addition and risk mitigation. As a long-term strategy, we aim to enhance the Company’s Petrochemical Intensity Index (PII) to 15% by 2030 from almost 5% currently. This will de-risk the refinery operations and boost the bottomline. The Company’s petrochemicals strategy is primarily based on utilization of captive feedstock and will be bolstered by investments in specialty chemicals and entry into emerging areas of compounding.

In March 2023, in a momentous leap, IndianOil’s Board has accorded ‘Stage-I’ approval for setting up a Petrochemical Complex at Paradip, Odisha, at an estimated cost of over Rs 6,000 Crore. This mega project will be the largest-ever investment of IndianOil at a single location and shall significantly improve the Petrochemical Intensity Index of the company. It shall be a growth driver in making the Company a major player in the Petrochemical industry while strengthening India’s self-reliance in the petrochemical sector. The Project is a megascale investment by IndianOil in the state of Odisha and will generate huge economic and social benefits for the country in general and Odisha state, in particular. More importantly, this mega project is aligned with Hopeful Prime Minister’s vision of Pursad, which aims to accelerate the development trajectory and socio-economic prosperity in Eastern India. As a major milestone, 2200 acres of land for the project have already been approved by the Government of Odisha out of which 800 acres has already been notified. The project will generate a multiplier effect for the local economy, and the extensive incentives

package from the Government of Odisha for this project will go a long way in strengthening this symbiotic relationship. This mega-project along with other significant ones on the anode of the Panipat Naphtha Cracker Phase II Expansion, Stryne Unit at Panipat and PVC Project at Gujarat Refinery will be a significant leap in IndianOil’s journey of excellence.

Bio-fuel Integration
The global trend of incorporating bio-fuels into refinery is gaining momentum and is gaining impetus from policy interventions such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). At home, the amendments to the National Policy on Bio-fuels-2018 have given an impetus to a wide range of alternate feedstock for use in ethanol and bio-diesel production.

The Company is already blending bio-fuels at its refineries and is supplying E10 Petrol across its network and also supplying E20 Petrol at increasingly many outlets. The refinery feed globally is expected to get diversified to include bio-based feedstocks, to produce renewable fuels, known for their low carbon footprint and can serve as domestic resources that can be seamlessly integrated into refinery operations. In India, there is policy support for bio-fuels, presenting a unique opportunity for the Company to establish its refineries as centres for advanced bio-fuel generation such as 2G, 3G ethanol and Sustainable Aviation Fuel (SAF).

The Company has set up Asia’s first 2G Ethanol Plant based on Paddy straw feedstock at Panipat having 3 Crore litres per annum capacity. It would use 2,20,000 MT / annum of feedstock and lead to annual emission mitigation of 7.5 lakh tonnes CO2 equivalent (replacing over 63,000 cars annually from roads of country). The plant was dedicated to the nation on August 10, 2022 by the Prime Minister of India.

In another first, IndianOil has set up World’s first Refinery off gas to ethanol (3G ethanol) producing plant of 4.2 Crore litres per annum capacity at Panipat. IndianOil is the first Oil Refining Company in the world which has adopted this technology. This would lead to mitigation of ~1.8 lakh tonnes of GHG emission / annum.

Additionally, the Company is collaborating with global technology leaders like Lanxeed, and Pajr for setting up Sustainable Aviation Fuel (SAF) plants. IndianOil plans to set up an 8.8 TMTPA capacity SAF Plant at Panipat, based on Lanxeed Alcohol to Jet (ATJ) Technology. The Plant will use 3G Ethanol as feedstock providing additional carbon benefits. IndianOil has also signed an MoU with Pajr to set up a 10 TPD capacity SAF demo plant in Pune and progressively scale it up to a 500 TPD capacity commercial plant by 2035.

Natural Gas
Increasing the share of gas in the energy mix is crucial to the de-carbonisation of the Indian economy. The government of India has a Vision of Pursad of achieving 40% share in India’s primary energy from Natural Gas by 2040.

In 2023, IndianOil is planning to build a renewable portfolio of 31 GW, which is significantly lower than that of China (82 kg) and the US (93 kg). This disparity presents a substantial opportunity for expansion and scaling within the sector, that will expand further with the rising GDP.

The Company targets to increase the share of gas in its energy mix to 15% by 2030. A supportive policy environment and bold reforms plans to increase Natural Gas share in India’s primary energy from 6.5% to 15%. A supportive policy environment and bold reforms in new energy areas. It is also forging synergistic alliances with other players to meet its growth targets. In line with this, the Company aims to expand its gas infrastructure and strengthen its supply chain by putting up new LNG terminals and gas pipelines. The participation in development of new infrastructure has been planned through multiple routes viz. looking of capacities in the upcoming LNG terminals, setting up of LNG terminals and laying of gas pipelines by the Company itself through the JVC route in addition to building CGD networks. The Company is looking at expanding its Ennore terminal from 5 to 10 MMTPA and has also booked capacity in the Jebelshand and the Dharmia terminals. It has been aggressively expanding its CGD network, both through its JV companies and on a standalone basis. During the 9th, 10th & 11th PNGRB bidding rounds, IndianOil on standalone basis bagged 26 Gas. At present, the Company along with its 2 JV Companies, is present in 49 Gas and 105 Districts spread across 21 States and UTs, making it one of the major CGD players in the country, reaching 26% of Population, covering 12.3% of area and meeting 15.2% of total CGD demand of the country.

Alongside, to ensure affordable supplies and insulate from price shocks, during the year, the Company continued to be in touch with various LNG suppliers for securing long term LNG through new contracts and renewal of existing contracts. In this respect Company has established long term LNG supply of around 2 MMTPA combined from ADNOC & Total Energies. These efforts for securing long term supply shall further strengthen IndianOil’s vision to be the ‘Energy of India’ and align to Government’s vision to increase the share of gas in its energy mix to 15% by 2030.

The Company’s endeavours continue to secure opportunities in domestic gas auctions that keep coming from time to time and its access to domestic gas is getting enhanced. Recently, the Company successfully bid tenders for procurement of domestic gas, with a combined volume of over 5 MMSMCM.

Transformation to a Holistic Energy Solutions Provider
The Company is constantly on the quest to provide energy solutions to the nation through new opportunities, both existing and new, sustainable, and smarter ways to meet the energy transition challenges. On a standalone basis, the Company, along with its JVs and subsidiaries, is already operating in new energy areas. It is also forging synergistic alliances with other players to meet its growth targets. In line with this Vision to be Net-zero by 2070, the Company has laid out its Net-zero plans as well, aiming to achieve it by 2046 (Scope 1 & Scope 2 emissions).

The Company recently announced its intention to pursue green initiatives at an altogether different scale and as a first step envisages the consolidation of all its existing green assets under the IndianOil’s Super Green Portfolio targets for green portfolio to 2030 & 2050. The Company intends to expand its green portfolio beyond its own 2046 target requirement, with a much larger role in contributing to the nation’s Net-Zero 2070 target.

From accounting for 8% of India’s energy basket today, the Company is not only transforming its energy basket from being oil-centric to a more holistic and diversified one but is also emboldening its role as India’s prime energy supplier.

Expanding Renewable Portfolio
The Company plans to build a renewable portfolio of 31 GW by 2030 and 200 GW by 2050. To expand this energy portfolio, the Company is collaborating with other public and private energy companies working in the space of clean energy technologies. In this regard, the Company formed INDECO Green Energy Limited, to explore and develop partnerships, exploring opportunities with respect to the potential collaboration through JV (50:50) with JV (Sutlej Jal Vidyut Nigam) Limited. The Company is also considering to spin off a ‘new wholly owned subsidiary’ to work towards this aim, while it consolidates its domestic and overseas assets. Further to these initiatives, IndianOil has approached states of Rajasthan, Gujarat, Karnataka, Tamilnadu, Andhra Pradesh for setting up GW scale RE projects and initial discussions have been initiated with Rajasthan, Gujarat, Karnataka.

Compressed Bio-gas (CBG)
CBG is produced from organic waste and is an alternative to compressed natural gas (CNG). The overall lifecycle of greenhouse gas savings of bio-methane, compared to natural gas, is typically very high - at 80 to 85%. Given its merits, CBG is going to be an important component of the Company’s green portfolio and is also likely to help in greening its operations as it works towards its Net- Zero 2046 target.

The Company has constructed a cattle dung based CBG plant at Hingonia Cattle Comfort Centre (HCC) of Jaipur, another plant in Gorakhpur based on mixed waste agri-corp residue has also been completed and another is being set up in Gwalior and is exploring setting up of 30 CBG Plants across India. The Government of Uttar Pradesh has introduced the Uttar Pradesh State Bio-Energy Policy-2022 providing various enablers and facilitation for setting up CBG Plants in the State. IndianOil is planning to set up its CBG Plant in Uttar Pradesh with total capacity of 10 Lakh TPD of biomethane for producing about 700 TMTPA of biomethane & waste gas.
Hydrogen

The National Green Hydrogen Mission, approved recently by the Government, envisages making India a leading producer and supplier of Green Hydrogen in the world and creating export opportunities for Green Hydrogen and its derivatives by including a slew of incentives.

In line with the Government’s National Green Hydrogen Mission, the Company is pursuing plans for hydrogen production across various hues, including utilizing renewable power to generate green hydrogen at its locations. IndianOil plans to set up 10 KTA (~85 MW) of hydrogen plants at Paradip. IndianOil’s Board has approved the formation of joint ventures with ReNew and L&T to develop (including construction) green hydrogen production assets and associated renewable assets. Another JV with L&T has been approved, which will manufacture and sell electrolyzers. Additionally, the Company’s R&D is working in the different areas of the hydrogen value chain such as bio-methane to hydrogen, bio-mass gasification to hydrogen, and electrolyzer technologies and fuel cells.

EV Charging and Battery Technology

The transition to electric vehicles is a promising global strategy for decarbonizing the transport sector. The EV market in India is expected to grow at a CAGR of 44% and is expected to hit 6.34 Million units of annual sales by 2027. The Company is crafting an ambitious blueprint in the electric mobility arena.

In addition to setting up charging stations and pushing for the battery-swapping model, the Company, through its JV IOC Phinergy Private Limited (IOP), is working on the niche Aluminium-Air battery technology. This has the potential to provide a viable and affordable e-mobility solution, based on domestically available and abundant raw material (aluminium). The technology has been successfully demonstrated in India as an energy back-up solution at the telecom sites of a leading Indian telecom tower operator. Currently, IOP is collaborating with leading automobile OEMs and aluminium suppliers for the development of infrastructure. IOP has plans to commercialize the AI-air battery technology in India, which includes manufacturing of the battery in India and setting up of the logistics infrastructure.

For propagating green mobility, IndianOil Board has recently approved the formation of a joint venture company for battery swapping business in India as a Private Limited Company with a 25:75 collaboration between IOCL and Sun Mobility Pvt. Ltd. Singapore (SMS). Sun Mobility is a global leader in providing energy swapping business in India as a Private Limited Company with a 76 battery swapping stations already under its fold.

Other Businesses

The Company is exploring opportunities outside energy business areas. Modernization and digitization is a risk-reduction strategy to help expand into new markets and industries and achieve greater profitability.

Cryogenic

Envisaged growth in the share of natural gas from the present 6.5% in the primary energy mix to 45% by 2050 offers a huge potential for growth in LNG, which uses cryogenic-based transportation. Furthermore, cryogenics is expected to play a crucial role in supporting varied applications of hydrogen since the liquefaction of hydrogen for storage requires sub-zero temperatures. The energy transition is, therefore, expected to be a spur for cryogenic vessels and cylinders. Cryogenics is amongst the sunrise industries of the ongoing energy transition.

The Company has a small but significant cryogenic portfolio, which it plans to nurture to seize the growth opportunities in the area. The Cryogenics group of the Company is a pioneer in its field, having over 40 years of experience in the design and production of state-of-the-art vacuum super-insulated Cryogenic Storage & Transport (CST) vessels. IndianOil has been supplying LNG through Cryogenic Road Tankers since 2007.

Anticipating high growth potential in the Cryogenic segment, especially in LNG, Liquid Oxygen & Liquid Nitrogen, the Company is setting up a new Cryogenics manufacturing facility at Nasik. Spread over an area of around 50 Acres the new state of the art facility will emerge as a major player offering a wide range of product and customised solutions in Cryogenics. With this new facility, installed capacity of Cryogenic vessels would be enhanced from 35 vessels per annum to 480 Nos per annum with production range extending up to 250 KCL, from existing 127 KCL. Further to this, LNG fuel tanks, Liquid cylinders & Microbulk systems, ISO tanks and Dispersing systems would be added to the product portfolio.

Explosives

The Company’s Explosives group has been actively pursuing business opportunities in the Industrial Explosives business in India. At present coal mining sector is the main customer for its explosives business. There is a preponderance of coal in India’s energy mix and with the growing energy demand of the country, the coal sector is expected to continue playing a major role in the future as well.

The Company’s first bulk explosives plant of 30 KTA capacity in western India was commissioned in Western India Early 2023 at Umber, near Nagpur. Another Bulk explosive plant at Basundhra (Odisha) has been constructed and is ready for commissioning. IndianOil would be setting up a 30 KTA Bulk Explosives Plant at the Singareni Collieries Company Ltd. (SCCL) premises at Mandamandri (Telangana). Also, a long-term Contract has been executed with Neyveli Lignite Corporation India Ltd. (NLCIL), Neyveli, Tamil Nadu. With this, the Company will be able to expand its footprint for the first time in the bulk explosives business in southern India. The Company holds a leadership position in the bulk explosives business in the country and is actively scaling up its presence, the Company also envisages entry into the packed explosives, a high-growth segment, through suitable collaborations.

Innovative Financing Solutions

The company has incorporated a wholly owned subsidiary IOCL Global Capital Management (IFSC) Limited (IGCMIL) in International Financial Services Centre (IFSC) at Gujarat International Finance Tec-City (GIFT City), Special Economic Zone (SEZ) Area. This company shall operate as a Finance Company predominantly in the areas of Global Treasury Centre, Trade Financing and Global MW. It shall undertake financial services primarily in respect of IOCL Group companies that are currently carried out outside India by overseas financial institutions and overseas branches/subsidiaries of Indian financial institutions. It shall also be providing platform to carry out operations of our foreign companies as well as future inbound and outbound investments of Indian Oil. New innovative business structures shall be created through IGCMIL to source funds and provide a better and efficient investment structure in place for fuelling the growth of group companies.

RISKS & CONCERNS

Organizations across the board are facing an exceptionally challenging risk landscape due to a series of disruptions, which began with the Covid-19 pandemic. Last year the Russia-Ukraine conflict triggered a fresh wave of crisis, disrupting commodity markets. This, in turn, led to a host of problems like surging global inflation, trade wars, capital outflows from emerging markets, energy security breaches, and social unrest in many parts of the world. Additionally, the rising global temperatures and the global push towards Net-Zero have added to the complexity of the situation.

The crisis of 2022 brought back energy security into focus. IndianOil as the flagship energy supplier to the country understands its responsibility of ensuring energy security, for which the Company is committed to enhancing the ability of its refineries to process a wider array of opportunity crude and strategically diversifying its supply sources. In 2022-23, 36 new grades were included in the Company’s crude basket and now the crude basket contains 247 grades from different regions like Africa, the Middle East, the Americas, and Russia etc.

FINANCIAL REVIEW

During 2022-23, the Company achieved a revenue of ₹ 9,35 lakh Crore, which is the highest amongst the Indian corporate entities. The Company has also set a new record with the best-ever annual Gross Refining Margin of USD 19.52 per bbl. The Company recorded the highest annual sales volume in its history and the physical performance across most of the segments witnessed significant growth. The capital expenditure of ₹ 37,87,004 Crore during the year is the highest-ever incurred by the Company, which reflects its commitment to the development and expansion of energy infrastructure in the country.

The sustainable financial performance of the Company and its various segments is summarised below:

<table>
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<tr>
<th>Particulars</th>
<th>2022-23</th>
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<td>EBITDA</td>
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The Company is committed to effectively managing the risk matrix it faces with ever-growing resilience and proactiveness. The major risks identified by the businesses and functions are systematically addressed through mitigating action plans on a continuous basis. Risks are assessed and managed at various levels with a top-down and bottoms-up approach, covering the enterprise, the business units, the functions, the market share and projects.

The risks identified by the Company inter-alia include:

- Economic risks arising from international crude oil and products market fluctuations;
- Financial risks such as foreign exchange rate fluctuations, exposure to borrowings;
- Competition risks arising from competitors within the existing businesses and from new businesses such as alternative energy sources, electric mobility;
- Operational risks such as pilferages, labour unrest, unplanned shutdowns of refineries;
- Security and fraud risks, including cyber-security, data leakage and physical security risks;
- Reputational risks such as brand value risk;
- Environmental risk arising from the impact on the environment from our business activities and increase in compliance cost in view of the emerging regulations;
- Compliance risks arising from tax disputes and litigation; and
- The risk of change in Government policies impacting profitability and ability to do business.

The energy transition offers opportunities but also comes with inherent risks, notably the potential for a disorderly transition. Such disorderliness can lead to insufficient future supplies, causing extreme price fluctuations and supply disruptions.

In addition to these, with ESG scrutiny on the rise, globally and in India, the Company has broadened its coverage of identified risks to include Environmental Impact in terms of the GHG emissions impact (SCOPE 1 & 2) and the water footprint.

FINANCIAL REVIEW

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In 2022-23, the Revenue from Operations experienced an remarkable growth of more than 28%, reaching ₹ 3,34,953 Crore from ₹ 2,28,445 Crore in the previous year. The combination of higher prices and a greater sales volume contributed to the substantial growth in revenue during the year.

In 2022-23, the Company’s EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) margin was at 3.59%, the Operating Profit margin was at 11.9%, and the Net Profit margin was at 0.88%. These figures show a decrease compared to the previous year, in which the EBITDA margin was at 6.93%, the Operating Profit margin was at 4.42%, and the Net Profit margin was at 3.32%.

The Net Profit for 2022-23 was ₹ 8,24,2 Crore compared to ₹ 24,844 Crore last year. The decrease in EBITDA, Operating Profit and Net Profit margin is mainly on account of lower marketing & petrochemicals margins and higher exchange losses during the year compared to last year. Due to lower profitability and increase in borrowings in comparison to the previous year, the Company’s return on average capital employed experienced a decline from 15.44% to 6.39%. However, its efficiency to deploy its assets to produce the revenue improved from 2.03 times to 2.33 times as revenue from Operations significantly increased in the year.

At the beginning of the year, crude prices were already at a higher level of about US$ 103/bbl which went further up to US$ 122/bbl in June 2022 before softening and closing at about US$ 76/bbl. The average HSD crack spread increased significantly from US$ 10/bbl in the previous year to US$ 114/bbl during the year with high volatility and the crack touched a high of US$ 56/bbl in June 2022. Similarly, the average M5 crack spread, which was about US$ 11/bbl in the previous year, improved to US$ 14/bbl during the year and touched a high of US$ 40/bbl in June 2022. The quarter-wise movement in refining margins (in ₹/bbl) is shown in the chart below.

The Singapore benchmark for refining margins improved during the year on account of the higher spread between international prices of petroleum products and crude. As can be seen from above chart, the Company’s normalised refining margin (i.e. normalised GRM) during the year moved in tandem with the international margins. Normalised GRM of the Company increased from US$ 761/bbl in 2021-22 to US$ 2044/bbl in 2022-23 compared to the increase in the Singapore GRM from US$ 4.99/bbl to US$ 10.77/bbl in 2021-22. The inventory holding by the Company was high on account of inland refineries, to which inventory gain/loss becomes significant during a fluctuating price scenario and hence, greater volatility was seen in reported margins.

The current ratio of the Company remained at the same level as the previous year, indicating a consistent balance between current assets and liabilities. Increase in borrowings led to a rise in the Company’s Debt-to-Equity ratio from 0.84 times to 0.98 times. On account of lower marketing & petrochemicals margins, higher exchange losses and increased finance cost compared to the previous year, profit for the current year reduced significantly, resulting in the deterioration of Interest Coverage Ratio from 8.25 times to 3.39 times. The debt service coverage ratio also experienced a significant decrease, dropping from 5.03 times to 1.30 times. Primarily because of higher principal repayment of long-term borrowings and a lower profit for the year.

The inventory-holding period was about 43 days and Company’s average collection period was 6 days. Both the return on Equity (ROE) & the Return on Capital Employed (ROCE) were lower in the year. The ROE fell from 20.00% to 6.20%, while the ROCE decreased from 15.44% to 6.39%. The variation was mainly on account of the reduction in profitability due to suppressed margins and significant exchange losses in comparison to the previous year. Higher dividend receipt during the year turned out to be a key reason for increase in the Return on Investment (ROI) from 4.69% to 9.18%. The company paid a final dividend of ₹ 3,305 Crore for the financial year 2021-22 during 2022-23. The Company’s earnings per share (EPS) for the year 2022-23 stood at ₹ 5.98, but no interim dividend was declared during the year. However, the Board of Directors recommended a final dividend of ₹ 3.00 per equity share (face value ₹ 10/- per equity share) for 2022-23, subject to approval by the members of the Company in the Annual General Meeting. Detailed information on indicators and ratios for the last five years are provided in the section ‘Performance at a Glance’ forming a part of the Annual Report.

Group Financial Performance

The Group’s Revenue from Operations for the year amounted to ₹ 9,51,410 Crore, depicting a significant increase compared to ₹ 7,36,716 Crore in the previous year. However, the Net Profit for the current year stood at ₹ 6,79,412 Crore, reflecting a decline from ₹ 15,910 Crore in the previous year mainly on account of factors which impacted the standalone performance of the Company. A detailed breakdown of the profit from standalone to group is provided in Note 46 of Consolidated Financial Statements.

The financial performance of the material subsidiaries, Joint Ventures and Associates is provided in Note 33A and 33B of the Consolidated Financial Statements. During the year Chennai Petroleum Corporation Limited, a subsidiary reported a profit of ₹ 3,53,153 Crore and a Total Comprehensive Income of ₹ 3,58,13 Crore. Another subsidiary, Lakia IOCL, PLC reported a profit of Srilankan Rupees 376.95 Crore and a Total Comprehensive Income of Srilankan Rupee 381.44 Crore which, after adjustments as per IndAS, translates to a profit of ₹ 365.60 Crore and a Total Comprehensive Income of ₹ 388.08 Crore. Under Joint Ventures & Associates, Petronet LNG Limited achieved a profit of ₹ 3,325.82 Crore and a Total Comprehensive Income of ₹ 3,321.46 Crore and IndiOil Petrochem Private Limited recorded a profit of ₹ 249.25 Crore and a Total Comprehensive Income of ₹ 249.04 Crore.

INTERNAL CONTROL SYSTEMS - PROCESS EXCELLENCE

The Company has put in place an internal Control System that ensures orderly and efficient conduct of business, including adherence to its policies, safeguarding its assets, prevention and detection of frauds and errors, accuracy and completeness of accounting and reporting. The same comprises various policies as well as detailed manuals, which cover almost all the aspects of the business. Organization-level controls, Operational-level controls, anti-fraud controls and general IT controls have been put in place to ensure that business operations are carried out efficiently, effectively and the chances of errors/frauds are minimised.

The internal processes and policies are reviewed from time to time to align them with the changing business requirements. The internal control systems are commensurate with the size and operations of the Company. It has an independent Internal Audit Department, headed by an Executive Director, who reports to the Chairman. The Department has officers from Finance as well as other technical functions. The audit assignments are carried out as per the Annual Audit Programme approved by the Chairman and the Audit Committee. The Internal Audit carries out extensive audits throughout the year covering every business process. The Statutory Auditors are also required to issue the Independent Auditor’s Report on the Internal Financial Controls over Financial Reporting for the Company under Clause (i) of Sub-Section 3 of Section 143 of the Companies Act, 2013. The report issued thereupon is attached to the Standalone and Consolidated Financial Statements respectively. The Audit Committee carries out a detailed review of the Financial statements and deliberations with the Internal Auditors and Statutory Auditors before the same is recommended to the Board for approval.

Human Resources

IOCL believes in holistic and meaningful employee engagements and the development of its human resources. The Company engages with the employees to tap their highest potential for the growth of its business. It assigns great importance to develop its human resources with a focus on its Core Values, which has been revitalized by adding a fifth value of “Nation First” to the existing values of Care, Innovation, Passion and Trust - It believes that the challenges surrounding the business environment can be mitigated by a workforce that is motivated, adaptive to change, innovative and fast in learning. Integrated HR practices through focused recruitment, career path and learning and development have contributed to the future readiness of the workforce. The Company has a structured and robust succession planning framework for the identification and development of talent for the leadership pipeline. The Company has not only groomed several visionary leaders who led and transformed the Company over the years but also groomed leaders for both the public and the private sectors.
IR Climate – Collaborative Value

The industrial relations (IR) climate in the Company has traditionally been harmonious. A collaborative IR climate has been maintained in the Company over the years to always be ready for the challenges. The Company ensures that the changes in its business environment, strategy & business models, the resultant impact on the current business and the people, along with future plans are regularly shared with the collectives and their views and suggestions are taken into consideration. Regular structured meetings are held between the management and the collectives to discuss and deliberate on issues like productivity, welfare and the need to build a responsive and responsible organisation. The collectives have always steadfastly supported the management in overcoming challenges faced by the Company.

As of March 31, 2023, the employee strength of the Company was at 31,095, which comprised 18,485 executives and 12,610 non-executives, including 2,726 women employees.

Other Information

The details regarding the Company’s CSR programmes, environment protection and conservation initiatives, technology absorption and adoption efforts, forays into renewable energy and foreign exchange conservation, etc., and are provided in the Directors’ Report and the Annexure.

Cautionary Statement

The information and statements in the Management’s Discussion & Analysis regarding the objectives, expectations or anticipations may be forward-looking within the meaning of applicable securities, laws and regulations. The actual results may differ materially from the expectations. The various critical factors that could influence the operations of the Company include global and domestic demand and supply conditions affecting the selling price of products, input availability and prices, changes in Government of India regulations/tax laws, economic developments within the country and factors such as litigation and industrial relations.